MANUAL

Organic Farming and Biodiversity in Europe:

Examples from the Polar Circle to Mediterranean Regions

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IFOAM EU GROUP

International Federation of Organic Agriculture Movements EU Group

Organic Farming and Biodiversity in Europe:
Examples from the Polar Circle to Mediterranean Regions

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Foreword

Biodiversity is a new word in our language that has come into widespread use only over the past 25 years. It is undisputed that humanity has had a devastating impact on biodiversity that has accelerated dramatically over the past 50 years. Even though we now understand the impact, our efforts to halt the decline, let alone reverse it, have so far been ineffective.

The consequences of this loss of biodiversity are becoming clear, and there is a global recognition that something must be done. What is not so clear is the way that we can halt this decline in the face of the destructive ecological footprint that our high-production, high-consumption lifestyle imposes on the planet. International agreements and resolutions and the promises of governments seem to have little or no effect – not surprising when the culprit is the insatiable growth of exploitative business interests that pay lip service to the need, but do not substantially alter their growth-centred business model that destroys life on our planet.

In 2010, the year of biodiversity, the Convention on Global Biodiversity reminds us of the depressing news that we have failed to reach the targets set in 2002 by the world's governments to avoid the rapid degradation and collapse of the natural systems that support our economies, lives and livelihoods. In October 2010, as we finalised this handbook, delegates from 190 countries debated the future of biodiversity in Nagoya, Japan. Expectations are high, but there is a real risk that a lack of commitment threatens an ambitious outcome. The Economics of Ecosystems and Biodiversity TEEB report from the United Nations Environment Programme has documented the multi-trillion dollar importance to the global economy of the natural world, and has highlighted the policy shifts that are needed. At the same time, the World Bank has launched a new programme that aims to embed environmental costs into national accounts bringing new economic approaches into the debate. We can only hope that these new initiatives will help finally to save biodiversity on the planet.

In March 2010, EU heads of state concluded that biodiversity must be integrated into farm policies. Critical to this will be the way in which the CAP is framed, so we welcome Commissioner Cioloş' recognition of the vital role of biodiversity – we hope that this will be placed at centre stage in the upcoming reformed CAP.

As important as the vital need to maintain genetic diversity is the need for farmers to adopt systems that encourage agrobiodiversity. As the ground-breaking global IAASTD report concluded: ecologically-based approaches to agriculture are essential. Organic farming is one such approach highlighted as an example of such an ecological system of food production.

It is welcome that the European Parliament Resolution of 27 September 2010 has given prominence to the need to build capacity, to protect traditional knowledge and to use participatory planning and knowledge transfer to ensure the sustainable use of biodiversity. The Parliament has called on the Commission in its Resolution of 21 September to ensure mainstreaming of biodiversity into EU agricultural policy, so we can look forward to a CAP reform being shaped by Parliament and the Commission in a way that will ensure that mutually-reinforcing and consistent policies are introduced. These policies must make the most of farmers' roles in helping to achieve the EU's biodiversity objectives. This is not just nice to have – it is central to our survival. This needs a CAP which places the delivery of public goods at its heart – with taxpayers' money invested in policies that can deliver the ecologically diverse farming systems on which we, and all life on planet Earth depends. No longer can we stand by and watch the ecological catastrophe be revealed before our eyes.

Foreword

Organic farming is a systems approach that relies on rich biodiversity to keep the farm resilient to pests and climatic challenges. The principle of ecology, as one of the underlying concepts of organic farming, roots organic agriculture within living ecological systems. Organic farming can also significantly contribute to halt biodiversity loss on farmland. As outlined in the strategic research agenda, further research is needed by the Technology Platform Organics. Exchange of best practices and effective farm advisory services that enable adapted biodiversity solutions for individual farms are essential to deliver the full potential. Organic farms can also be used to demonstrate techniques to enhance biodiversity relevant to non-organic farms.
We hope that this handbook will shed some light on the current state of biodiversity on farmland from the point of view of organic food and farming in Europe and thus will contribute to the ongoing urgent political process of delivering urgently-needed solutions.

Christopher Stopes, *President of the IFOAM EU Group*

Organic Farming and Biodiversity in Europe: Examples from the Polar Circle to Mediterranean Regions

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1. Biodiversity in Europe

Rishi Kukreja
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Introduction

Biological diversity is in a very precarious state at the moment. The environment is seeing a loss of plant and animal species at alarming rates. 50% of species, and up to 80% of habitat types of European conservation interest are reported to have an unfavourable conservation status. *(European Commission Communication, 2008)* 43% of European farmland birds also face a dire and highly uncertain future. *(BirdLife International, 2004; SEBI, 2010)* According to the European Red List, 23% of amphibians, 19% of reptiles, and 15% of mammals are threatened with extinction. *(European Commission Red List)* Society at large is still not at all mindful of it1, but what science has been telling us for many years already, and what is slowly growing in consciousness politically is that biodiversity is an important indicator for the stability of ecosystem services delivery that are essential for the survival of our society.

The hidden value of biodiversity

While we still do not understand all environmental interactions, especially when it comes to biodiversity in soils, and the number of species we are knowledgeable on is very limited, there is sufficient comprehension of the value of biodiversity and ecosystem services for civilisation. This value can manifest itself ecologically in terms of cleansing of air, water, soil; pollinating or reproductive services; culturally in terms of aesthetics, religious meanings, ethics and tourism; and economically in terms of resource provision. Some have even argued for biodiversity to carry ethical value, meaning we have a moral duty to protect all life and preserve it for future generations, and informational value, providing inspiration for scientific innovation and technologies. All of these aspects are fundamental to our existence and indispensable for our continued well-being. Some aspects of biodiversity provide us with material benefits such as food, medicine, construction material, others offer vital background services, such as the water or carbon cycle, through photosynthesis, along with regulating services keeping climate in check and protecting from floods, and yet others take on a spiritual dimension, such as the relaxing effects of a forest, inspiration potential of a landscape, and the enjoyment derived from outdoor recreational activities and sports.
Biodiversity is experienced differently by all of us, depending on our upbringing, what stage of life we are in and the role we play in society. As a farmer you will see biodiversity quite differently than as a travel agent, fisher or botanist, and yet these people will all agree, to differing degrees, that they value and protect biodiversity. A child will yet again perceive biodiversity differently from a pharmaceutical enterprise or religious congregation.

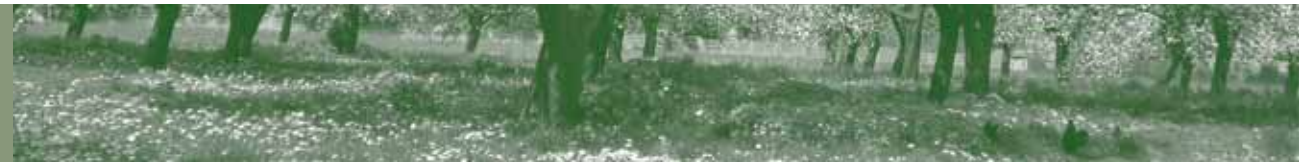
Combating biodiversity loss

The threats to biodiversity are manifold. There is no one main or root cause; it is rather the interaction of several factors causing biodiversity decline. Among these, the leading for farmland on the European continent are increasing agricultural specialisation and intensity, large-scale marginalisation, land abandonment, nitrogen emissions, invasive alien species, climate change, overfishing. *(SEBI, 2010)* Other important causes are increased fertiliser and pesticide use, and the introduction of irrigation and drainage. Despite successive reforms of the CAP, especially compulsory agri-environment measures under the CAP since 1992, biodiversity conservation efforts continue to be undermined as a result of land abandonment *(Keenleyside and Baldock, 2006)*, the fragmentation of semi-natural habitats, the loss of farmland features, high chemical input use and the conversion of pasture land to arable.
Needed to counter these developments is recognising and protecting high-nature value farmland, extensive agricultural practices and less intensive agriculture, (re)creation of natural habitats, and remodelling farms into being able to accommodate habitats. The EU has responded with several communications, action plans and assessments to combat the loss of biodiversity. Notably its Habitat Directive from 1992, intended as add-on to the existing Birds Directive from 1979, setting forth the establishment of a Natura 2000 network of protected areas, was a milestone in biodiversity protection measures and continues to play an important part in this fight. The European Natura 2000 network now covers a proud 17% of EU land. *(European Commission Communication, 2008)*
The EU's impact on global biodiversity cannot be emphasised enough, through its consumption patterns, economic influence and political dominance. In particular, overseas regions of EU countries, often biodiversity hotspots, are not covered by nature legislation. Voluntary schemes copying the Natura 2000 approach could be a possible avenue for broadening the scope and positively influencing global biodiversity.
The European Biodiversity Strategy was set up in 1998, but did not succeed in meeting its goal of halting biodiversity loss. The communities' new biodiversity strategy post-2010 must be shaped more ambitiously, target the main drivers of biodiversity loss and be implemented in a cross-sectoral effort to meet the targets that were outlined by the Environmental Council on 15 March 2010. *(European Council Conclusions, 2010)* The Council agreed on the long-term vision: "by 2050 European Union biodiversity and the ecosystem services it provides -- its natural capital -- are protected, valued and appropriately restored (...)" and "a headline target of halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss".
But not only the EU as an institution, also innumerable farmers, institutes, organisations and companies have begun embracing biodiversity and actively contributing towards protecting it. Individual initiatives of farmers adopting extensive agricultural practices *(Grime, 1973)*, planting hedgerows, ensuring a variety of species and crop rotations on their fields, pond management, adopting organic farming practices, etc. or through the breeding and cultivation of landraces and diverse varieties adapted to regional environmental conditions, not only physically increase the abundance of species, but also prevent negative indirect effects, caused through the use of fertilisers, pesticides or herbicides, for example.
Also, companies depending on fresh groundwater resources or forest products or apiculture are increasingly engaging in stakeholder dialogue with neighbouring

Agrobiodiversity is a subtheme of biodiversity relating to the diversity of cultivated species and varieties as well as livestock breeds on farms, and plays an important role in ensuring adapted, traditional and/or locally-suited types are given the opportunity to grow over the ones selected and bred for large-scale industrial applications. Agrobiodiversity not only offers the option of actively promoting biodiversity through cultivation choices, but also increases the direct benefits of such diversity for humans by providing us with a range of foods and pharmaceuticals we know how to deal with, and as additional bonus point ensures species cultivated are adjusted to the local conditions.

Part I: Background

Part I: Background



residents, farmers and industries to develop common practices and strategies to protect their source of income. The EU must take up these best-practice examples to mainstream biodiversity in its policies.
To highlight the costs of services nature provides to us free of charge, numerous ecosystem services calculation tools have been developed. Most noteworthy is The Economics of Ecosystems and Biodiversity (TEEB), supported by UNEP, a series of publications assessing the value of biological diversity for society. All can be downloaded from **www.teebweb.org**.

Outlook
Biodiversity is home to a countless collection of hidden helpers working tirelessly day and night to provide us with homes, clothing, fuel, nutrition, medicines, that has kept the weather at bay, provided oxygen, organic matter and healthy soils, inspired artists and poets and scientists alike, and given us the appreciation of beauty. These helpers have been ignored and undervalued for too long. As we come to terms with the fact that the EU's ambitions for 2010 have not been achieved, the gravity of our inaction is slowly beginning to seep into our consciousness. It's time we honoured those we are deeply indebted to, and set ambitious targets for 2020, along with commensurate strict measures and actions. We owe it not only to ourselves, but to biodiversity, its lost species and the generations yet to come.

[1] Only 38% of Europeans are aware of the significance of the term, and only 19% feel directly affected by biodiversity loss, according to a 2007 Eurobarometer on Attitudes of Europeans towards the issue of biodiversity: http://ec.europa.eu/public_opinion/flash/fl_219_en.pdf

2. Organic Agriculture and biodiversity – a review from literature

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Biodiversity encompasses the diversity of life on all levels: the diversity of species, the genetic diversity, as well as the diversity of habitats and ecosystems. Organic farming demonstrates a clear advantage for biodiversity in comparison to conventional farming: Depending on altitude, organic farms have between 46 and 72 percent more uncultivated natural habitats and host 30 percent more species and 50 percent more individuals than their non-organic counterparts. The lower cultivation intensities and higher proportion of uncultivated areas encourage habitat-typical plants and animals to continue to exist on organic farms and allow farmers to benefit from an intact and therefore a sustainably-functioning ecosystem.

Modern agriculture degraded diversity once created by farmers
Due to agricultural activities, a great variety of ecosystems have been created by human beings, which have enhanced biological diversity. During the last century, the unsustainable production of food, feed, fibre and fuel strongly degraded global ecosystems and the services those systems provided for human survival *(Millennium Ecosystem Assessment, 2005)*. However, biodiversity is an important driver for the stability of agro-ecosystems *(Altieri and Nicolls, 2006)*, and hence pivotal for a continuously stable supply of food.
Agriculture affects biodiversity directly through cultivation practices. Furthermore, it affects biodiversity indirectly through nitrogen emissions into the air and CO_2 emissions into the atmosphere. On land under intensive agricultural cultivation, biodiversity decreases significantly due to the high nutrient influx, high cutting frequencies on meadows, high stocking rates, use of pesticides, and modern methods of processing cut grass. In the lowlands, many diverse agricultural ecosystems have disappeared, while in the mountain regions two parallel trends are apparent: the intensification of productive areas and the abandonment of unproductive but ecologically valuable areas.

Services provided by biological diversity are economically important
The pace of these degradations has not yet been halted or reversed, although the preservation of biodiversity has become the axiom of agricultural policy. Some of the services biodiversity provides to society are not only of aesthetical or ethical value but are also economically important for farmers. The economic value of pollination of crops worldwide for instance was estimated to be € 153 billion *(Helmholtz Association of German Research Centres, 2008)*, and the replacement of pesticide applications by biological control mechanisms was estimated to range within US$ 3 and 119 billion (€ 3 and 121 billion) *(de Groot et al., 2002)* per year on global arable and permanent crops[2].

How advantageous is organic farming for biodiversity?
Biodiversity effects are among the most frequently studied environmental impacts of organic agriculture. This is done by comparing organic agriculture to other farming systems, usually referred to

as 'conventional' agriculture. Acknowledging the fact that both conventional and organic agricultural practices are very diverse, overlapping is possible. Nonetheless, organic farms do have distinctive advantages for on-farm and landscape biodiversity. In summary, studies attribute the higher biodiversity in organic systems to the following factors: a) a ban on herbicides and artificial pesticides, b) a ban on mineral fast release fertilisers, c) more diverse rotations, d) organic fertilisation e) careful tillage f) a higher share of semi-natural habitats in total Utilised Agricultural Area (UAA).

Yet, a high biodiversity is not the accidental consequence of organic farming practices; it is rather actively planned and designed by most farmers. An organic farm becomes more successful in a diversified landscape where there are sufficient semi-natural landscape elements like hedgerows, fallow-ruderal habitats and wildflower strips, which serve as natural sources of controlling pests *(Zehnder et al., 2007)*. The use of compost, more diverse crop rotations and intercropping foster higher abundance and diversity of micro-organisms, earthworms and insects which again lead to faster and better mineralisation of nutrients from both the organic matter and the soil. An increase of biodiversity is therefore a vital economic interest of organic farmers in order to improve the nutrition of the crops and aimed at lowering the risk of pest and disease outbreaks.

Higher diversity of species on organic farms can be quantified…

Recent meta-studies *(Bengtsson et al., 2005; Fuller et al., 2005; Hole et al., 2005)* show that organic farming practices are – compared to conventional fields or farms - most beneficial for birds, predatory insects, spiders, soil organisms and the arable weed flora. Insect pests and indifferent organisms on the other hand do not show different levels of abundance in organic and conventional farming systems. In very rare cases, organic production was found to have negative impacts, although this was outweighed by studies showing positive impacts. On average, a 30 percent higher species diversity and a 50 percent greater abundance of beneficial animals in organic fields was achieved and measured on organic farms. *See table 1*

… among mammals

Organic farming increases species diversity and abundance of mammals like the long-tailed field mouse, voles and shrews, which is likely to be due to field margins, less intensive cutting regimes and hedgerows on organic farms *(Brown, 1999)*. Higher insect prey and a better quality of habitats (e.g. hedgerows and wetland area) enhance the species diversity and the abundance of bats *(Fuller et al., 2005; Wickramasinhe et al., 2003)*. Bats play a crucial role in insect control, as pollinators and for the dispersal of fruit seeds.

… among arthropods

Arthropods – commonly insects and other animals - are characterised by a very high species diversity and have important functions in agro-ecosystems. Arthropod diversity is increased in studies comparing organic with conventional farming *(Drinkwater et al., 1995; Hesler et al., 1993; Wyss, 1995; Wyss et al., 1995; Mohamed et al., 2000; Klingen et al., 2002; Östman et al., 2003; Peng und Christian, 2005; Birkhofer et al., 2008)*. Many of these studies show that the increased diversity leads to a highly-improved control of pest insects by predators and parasitoids. In a comparative study in Ireland, organic farms had significantly greater biomass, diversity and species richness of beetles when compared to intensive and rough grazing farms, having a positive effect on the decomposition of manure or livestock excrements on pastures *(Hutton et al., 2003)*.

Part I: Background

… among birds

Several investigations of birds on conventional and organic farms show six times more breeding territories and eight times higher population densities of birds on organic farms *(NABU, 2004)*. Soil-breeding skylarks and yellowhammer were able to rear a higher number of offspring on organic farms in England as the feed supply (especially insects and weed seeds) was much higher *(Wilson, 2005; Wilson et al., 2007)*. Data from the Netherlands showed seven times higher nest densities of skylarks on organic croplands *(Kragten et al., 2008b)*. The density of territories of skylark and the endangered Northern Lapwing (Peewit) is two to three times higher on organic than on conventional cropland *(Kragten et al., 2008a)*.

… among wild plants and pollinators

Equally positive is the botanical diversity affected by organic farming. Through intensive farming, 80 to 90 percent of the species of the segetal flora of the European cropland is currently on the red list of endangered species. Many investigations show that the species diversity of the segetal flora on organic fields is up to six times increased compared to conventional cropland *(z.B. Gabriel und Tscharntke, 2007; Holzschuh et al., 2007; Gabriel et al., 2006; Frieben und Köpke, 1995; Fuller et al., 2005; Hald, 1999; Kay und Gregory, 1999)*. Less pronounced is the difference in plant species diversity on permanent grassland.

The pollination of crops and wild plants was shown to be better on organic farms and in regions with a high proportion of organic farms. Domestic honeybees, wild bees, butterflies, bumblebees and other insects are the most important pollinators in Europe. Organic farming benefits all these pollinators *(Moradin and Winston, 2005; Rundlöf and Smith, 2006; Gabriel and Tscharntke, 2007; Holzschuh et al., 2007; Rundlöf et al., 2008)*, mainly because of the higher abundance of wild flora and weeds, higher proportion of (semi-)natural land areas and less mortality because of the ban of insecticides.

… among earthworms and micro-organisms in soils

Soil processes which guarantee crop productivity are steered by a rich magnitude of organisms. Many scientific studies show that earthworms *(Pfiffner and Mäder, 1997; Pfiffner and Luka, 2007, Hole et al., 2005)*, soil dwelling arthropods *(Pfiffner and Niggli, 1996; Pfiffner and Luka, 2003)* and soil bacteria, fungi and mycorrhiza *(Fließbach et al., 2007; Mäder et al., 2002; Hartmann et al., 2006a; Esperschütz et al., 2007; Mäder et al., 2000; Oehl et al., 2004)* are positively affected by organic farming. The diversity of these taxa, their abundance and their functionality is strongly increased in comparison with conventional or integrated farming systems. In long-term comparisons in Switzerland, some of these positive effects were not limited to the upper soil. Higher microbial biomass and earthworm populations were measurable also below the plough sole at a depth of 60 centimetres *(Fließbach et al., 1999)*.

A high diversity of soil organisms is of paramount importance for the decomposition of manure and crop residues, helps crops to access soil nutrients and makes soils capable of breaking down pollutants created by humans and their activities. Soils which had been managed for a very long

Taxa	Impacts of organic farming		
	Positive	No difference	Negative
Plants	16	2	0
Birds	11	2	0
Arthropods			
Beetles	15	4	5
Spiders	9	4	0
Butterflies	2	1	0
Bees	2	0	0
*Other arthropods**	8	3	1
Bacteria, fungi and nematodes	11	2	0
Earthworms	11	2	0
Total	**87**	**28**	**8**

* mites, bugs, millipedes, flies, and wasps

Source: Hole et al. 2005, updated by Niggli et al., 2008

Table1 Impact of organic farming systems on biodiversity when compared to conventional agriculture (synthesis of global literature data; the numbers in the table refer to the number of articles published with the respective finding)

time organically showed an increased functionality of soil micro-organisms which enabled them to break down more diverse carbon compounds *(Fließbach and Mäder, 1997)*.

Genetic diversity of crop and livestock varieties

Genetic biodiversity is influenced both positively and negatively by organic farming. On the one hand, many organic farmers cultivate rare plant and animal species on their farms, e.g. because they are better adapted to local conditions. On the other hand, the restriction on admission of varieties hampers genetic diversity and the increasingly important access to supermarkets encourages the use of modern, genetically more homogenous varieties in organic farming as well. There is no evidence that organic farming performs better concerning genetic diversity of crop and livestock.

Diversity of habitats and landscapes

Concerning landscape and habitat diversity, organic farming may perform better due to more diverse crop rotations and higher implementation rates of structural elements such as hedges and fruit trees. However, landscape effects are very farm and site-specific. Therefore, no general trend can be determined.

In a Swiss study where 100 percent of organic and conventional farms subsidised by agro-environmental schemes were analysed, the organic farms used 22 percent of their UAA as non-productive ecological compensation areas whilst conventional farmers used only 13 percent, despite the fact that these areas were equally subsidised on organic and conventional farms *(Schader et al., 2008)*. Similar results were measured in France (Boutin et al., 2008) and in England *(Gibson et al., 2007)*. The interest of organic farmers in participating in agro-ecological measures fostering biodiversity and landscape quality is likely to be genuine.

Future challenges

Biodiversity is a prominent element of the principles of organic agriculture as defined by IFOAM. Nonetheless, minimum requirements or goals as best practice are not defined in the organic standards which are certified worldwide. Although agricultural inputs like pesticides and fertilisers are accurately controlled in certification, the impact of the farm management on biodiversity is not part of the checklists during inspections. In many European countries, agro-environmental policies of the Common Agricultural Policy (CAP) encourage organic farmers to practise high biodiversity farming. Without economic incentives e.g. in developing countries, organic certification does not guarantee improved on-farm (semi-) natural habitats and a higher biodiversity *(Oelofse M., 2010)*. Amended standards and impact-related certifications are being developed in some regions and will become important as the provision of public goods will become more prominent in the post-2013 CAP.

[2] World arable land area 1'380'515'270 hectare; world permanent crop area 146'242'120 hectare. (FAOSTAT, 2008)

Part I: Background

3. Organic agriculture and protection of biodiversity in Romania

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Abstract
The EU target to halt biodiversity decline by 2010 has not been met. High Nature Value (HNV) farming actively conserves a major part of Europe's biodiversity. Biodiversity conservation through HNV farming is extremely cost-effective, since it also brings social and economic benefits. The small-scale farming communities in these areas are at a commercial disadvantage, and are also not effectively supported by the Common Agricultural Policy. They are threatened just at the time when European conservationists and policy-makers are understanding the economic as well as biodiversity case for supporting these landscapes. Organic certification can be a useful tool to enhance the incomes of small-scale HNV farmers, preventing farm abandonment in these farming systems that are linked to rich biodiversity. But this will only become effective when organic markets improve, and when organic support measures are established under Romania's Rural Development Programme.

Keywords: Romania, Rural Development Programme, High Nature Value, small-scale farming communities, biodiversity, public goods, organic, agri-environment.

Fig.1 Mosaic arable/ haymeadow / forest landscape typical of Romania's HNV landscapes.
Credit Fundatia ADEPT Transilvania

Introduction

A key feature of Romania's agriculture is its High Nature Value farmed landscapes, remarkably rich in biodiversity. In these mainly HNV areas, the farms are highly fragmented in structure: the landscapes retain a balance of forest, arable land and semi-natural grasslands. *See Fig. 1*
In Europe, these types of mosaic landscapes, particularly associated with small farms, have higher biodiversity than wilderness areas. *See Fig. 2*
Farm sizes cover a wide spectrum: Romania's smaller farms are concentrated in the uplands, linked with livestock farming and HNV permanent grasslands. Very large corporate farms are concentrated mostly in flatter, arable and more intensively farmed areas such as the Danube plain in the south of the country. *See Fig. 3*
Romania's semi-natural grasslands cover an estimated 2.3 million ha, 20% of the total agricultural area; the average in EU member states is 12% *(Paracchini et al., 2008)*. Inclusion of HNV arable land brings the figure nearer to 30%. Romania therefore provides for Europe a vast area of biodiversity-rich HNV landscapes. They are, to Europe, a treasure-house of Public Goods including: biodiversity conservation, resistance to fire and flood, water purification, sustainable soil use, pollination, carbon sequestration, and resistance to climate change.

Part II: Farming

In its National Rural Development Programme (NRDP), the Romanian government placed emphasis on agri-environmental payments to support HNV grasslands. In contrast, from accession until the present, there has been no organic support measure under the NRDP.

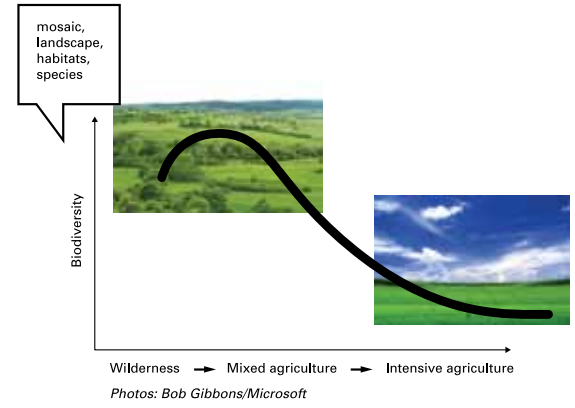

Fig.2 Mixed traditional agricultural landscapes in Europe have higher biodiversity than wilderness areas.
Source: after Hoogeveen et al., 2001

Problem statement

In spite of their value in terms of public goods, especially biodiversity, Romania's HNV landscapes are under severe threat. The small-scale farms cannot compete economically with larger, more intensive farms elsewhere in Romania and in Europe: NRDP measures are not effective in adjusting the balance. HNV landscapes do not offer secure livelihoods to the small-scale farmers who have created them, who live in them and maintain them.
One example is the crisis in the dairy sector: Small-scale dairy production is key to the survival of the HNV landscapes of Romania. But over 50% of registered producers have fewer than 5 cows, and over 75% of registered producers have under 10 cows. Surveys carried out by Fundatia ADEPT *(R. Popa, unpublished)* show a reduction of cow numbers of 25% in the last year alone, 2008-2009, in the Târnava Mare area of Transylvania. The price that small producers get for their milk no longer offers them a reasonable income; larger producers benefit from economies of scale.

Fig.3 Areas eligible for HNV grassland agri-environment payments in Romania, based on estimation of communes with more than 50% permanent grasslands. *Source:* National Rural Development programme, Romania 2007.

Beyond commercial viability, how well are small-scale farmers supported by Direct Payments (Pillar 1 income support) and environmental payments under Axis 2? Herein lies another problem:

- 45% of Romania's 4.2 million farm holdings are under 1 ha in size and therefore not listed in the Farm Register or EUROSTAT, nor are they eligible for area-based payments (Agri-environment, SAPS - Single Area Payment Scheme). Many of these lack status as legal entities.
- 91% of Romania's farm holdings, 45% of Romania's farmland, is under 2 ESU (a measurement of economic activity equivalent to standard gross margin of €1,200) and are not eligible for investment grants under Axis 1. *(National Rural Development programme, Romania 2007)*.

This means that the small farms that are strongly associated with public goods delivery, especially biodiversity conservation, are not supported by the EU's Direct Payments (for income support), or by the Rural Development Programme. This includes nearly half of Romania's farmed area, and well over half of its HNV landscapes.

Goals

Romania's smaller farmers should:

1. add value to their products, to increase their commercial viability
2. be supported by the CAP in line with the importance of the public goods / ecosystem services they provide.

Implementation

Organic farming can solve both of these problems.

The domestic market for certified organic products in Romania is not well developed. However, there is a strong demand for traditional, peasant products, and farmers' markets are surprisingly well developed. The public is willing to pay more for traditional products.

Currently, many of the consumers don't distinguish between organic certified products and traditional products, because of a lack of information. Thus, small farmers who are certified organic do not generally obtain a premium for their products.

Fig. 4 Many traditional products in Romania are effectively organic, but not certified. Cost of certification is a barrier. Most small farms do not keep the farm records that are required for organic certification and inspection.
Credit Fundatia ADEPT Transilvania

To cite an example, until 2009 Romania had only one small organic shop, called Biocoop in Sibiu. However, customer interest has increased and in 2010 Romania has at least two shops selling organic certified products in all important cities. Many of these shops are importing products because there is insufficient quantity and diversity of supply of organic products within Romania.

The number of certified organic producers in Romania has shown a continuous rising trend, but starting from a very low base:

The number of farms fell in 2009, although certified area rose, because some small farms did not complete conversion owing to transaction costs, and the farms completing certification are increasing in size, since they can bear transaction costs more easily. Although there were no organic support payments under CAP Pillar 2, in 2008 the Romanian Government offered a payment for organic conversion: payments for grasslands were for a maximum of 20 hectares, approximately €100 per hectare plus 50% of the cost of certification up to a maximum of €215 per year. Farmers did not receive this or any other organic support in 2009.

In 2010 the Romanian Ministry of Agriculture and Rural Development (MADR) announced a degressive payment for farmers entering organic conversion. The farmers need to have a juridical status and to remain organic for minimum 5 years. The effects of this measure will not be available until the end of 2010.

Many organic farmers in Romania have certified their land organic in order to obtain support payments, but do not sell their products as organic because there is no available market for them: the products are sold on the conventional market.

The cost per year of annual inspections after certification could be €150-400 per year for a small farm. There is currently no support for annual inspections, or for loss of production under organic management. The MADR has proposed such a measure to be included in the NRDP. Currently, Fundatia ADEPT is working with MADR on the design and pilot testing of this measure.

Indicator	2006	2007	2008	2009
Number of certified farms	3,409	3,834	4,191	3,228
Surface of certified farms (ha)	143,194	190,129	221,411	240,000
Area of certified farms as %age of Romania's total agricultural area (ha)	1.0%	1.3%	1.5%	1.6%
Farm surface cultivated with annual culture (ha)	45,605	65,111	86,454	110,014
Farm surface with permanent culture, pastures and meadows (ha)	51,200	57,600	46,006	39,232
Farm surface with permanent culture, Orchards and vineyards (ha)	294	954	1,518	1,869
Other surface in organic farming (ha)	46,095	66,463	87,432	88,883
Number of organic food processors	39	48	85	70

Table 1 Trends in organic agriculture in Romania. (*Source: Romanian Ministry of Agriculture and Rural Development, 2010, www.madr.ro*)

Example of good practice: Seica Mare common grazing

ADEPT has worked since 2007 with a farmer group from the commune of Seica Mare, which in 2010 formed a grazing association with over 20 members, CALVA Seica Mare. CALVA has a 5-year rental contract over 940 ha of grassland that is the property of the Town Hall. Based on this, CALVA has successfully applied for agri-environment payments of €200.000 per year.

CALVA plans to use the agri-environment income for community investments in buildings and equipment for processing of local products, including organic. Since 2010 CALVA also applied for 238 ha of this land to be certified for organic farming, land which is now under conversion.

The certification process for CALVA association will be a useful model for other grazing associations, which generally are not supported on the basis of common grazing land. The organic certification process will also improve the general standards of farm record keeping in the small farms and grazing associations, which are often below standard.

Example of good practice: adding value through Târnava Mare branding

In 2005, ADEPT began a processing and marketing programme in the Târnava Mare area. Although these are not certified organic products, they are premium-price high-quality products, and demand outstrips supply. This shows how sales of branded local products can evolve with effective marketing, and shows that there is a demand for higher-priced, higher-quality products. *See Table 1*

It is worth noting that the prices of cheeses and jams sold under the Târnava Mare label are 50-80% higher than standard unlabelled products, and yet experience at markets shows that customers tend to buy the higher-priced products in preference.

Part II: Farming

Farmers markets selling local/traditional products are now becoming a feature in major Romanian cities. This would not have occurred without active support from the MADR and the Romanian Agency for Animal Health and Food Safety (ANSVSA).

Year	Value of direct sales (cheese, jam, pickles)	Value of sales through Tourist Information Centre
2005	--	
2006	€3,600	-
2007	€15,900	€2,500
2008	€75,000	€8,500
2009	€31,500	€12,161

Table 2 Trends in sales
(Source: Târnava Mare Producers Association, pers. comm., 2010)

Fig. 5 HRH The Prince of Wales meets traditional producers in Transylvania. High-profile support is obviously excellent for sales.
Credit Fundatia ADEPT Transilvania

Discussion & recommendations

Organic farming is currently not a significant tool for maintaining small-scale HNV farmers in Romania. However, current trends indicate that it will be because:

1. Romania's HNV farmlands occupy a significant proportion, 25-30%, of Romania's total agricultural area. These are often in a mosaic in which small-scale arable land is rotated with hay-meadow use. These mosaic landscapes are exceptionally high in biodiversity.
2. The land management practised in Romania's HNV farmed areas, including the small-scale arable rotations, is also beneficial for control of pests and diseases and maintenance of soil fertility without artificial pesticides and fertilisers. These systems are often de facto organic, even though not certified as organic. These landscapes are very suitable for organic certified management.
3. The small-scale farmers would have no difficulty in the practical organic management of their land, since it would require little or no changes in current practice. However, it would require improved farm record-keeping.
4. There is a growth in urban demand for organic products, much of which is currently supplied by imported products. As the capacity of Romanian organic producers increases, to produce and process varied products in sufficient quantities, there should be a premium market available.
5. Organic support payments are likely to be brought in under the NRDP, to support certification and management. These payments are likely to be strongly degressive, offering a high payment per hectare for smaller farms, and a cap at 100 ha. This is an excellent way to provide effective financial incentives to very small farms without excessive payments to larger farms.
6. Organic payments will only be available to farmers registered for direct payments in the national farm register. Only those holdings with a minimum size of 1 ha in parcels of over 0.3 ha can register. This excludes 45% of Romania's holdings, and particularly those small holdings associated with mosaic landscapes and highest biodiversity. A reduction of the minimum holding size, to perhaps 0.5 ha, will significantly help Romania to meet its biodiversity conservation targets, as well as bringing other socio-economic benefits to the country in which rural communities still represent over 40% of the total population.

4. Old orchards – treasures of biodiversity

Dorota Metera
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Summary

Old fruit trees are a mixture of tradition, biodiversity protection and a starting point for new businesses, selling high-quality organic fruits with a rural nostalgic image. Passionated scientists have re-discovered the beauty of old varieties, and also farmers have changed their approach to marketing old fruit trees, since organic apples guarantee a better price and offer the opportunity of getting subsidies for organic orchards.

Biological diversity in old orchards

Old fruit trees are natural monuments, witnesses of old horticultural art, symbols of the favourite tastes of consumers, and a potential source for the development of new varieties of species, thanks to their proven strengths of resistance to frost and pathogens, and longevity. Old orchards are a typical element of the cultural landscape of the villages in some regions, and especially beautiful during the times of blossoming and harvest. They also create a habitat for thousands of accompanying species of wild plants and animals from spiders and insects to birds. Small orchards with high trunk fruit trees are an ideal habitat for birds – from a few up to 30 pairs of birds can be found nesting there, and several others visit the orchard regularly, while living in the nearby surroundings. The most popular birds are coalmouses *(Parus major and Parus caeruleus)*, Greenfinch *(Carduelis chloris)*, House Sparrow *(Passer domesticus)*, Eurasian Tree Sparrow *(Passer montanus)*, Magpie *(Pica pica)*, Blackbird *(Turdus merula)*, Starling *(Sturnus vulgaris)* and Chaffinch *(Fringilla coelebs)*. In the winter it is possible to observe Bohemian Waxwing *(Bombycilla garrulous)*, Brambling *(Fringilla montifringilla)* and Bullfinch *(Pyrhula pyrhula)*. Visiting species are Hawfinch *(Coccothraustes coccotrhrauses)* and Green Woodpecker *(Picus viridis)*. Big orchards with tall old trees provide good conditions for Eurasian Tawny Owl *(Strix aluco)*, Hoopoe *(Upupa epops)*, Eurasial Golden-Oriole *(Oriolus oriolus)*, Great Spotted Woodpecker *(Dendrocopos major)* and Lesser Spotted Woodpecker *(Dendrocopos minor)*, Eurasian Jay *(Garrulus glandarius)* and Wood pigeon *(Columba palumbus)*. The presence of so many birds is important for insect control. The coalmouse, as an example, consumes a mass of insects that equals 200% of its own mass and "cleans" approximately 40 trees during the time of feeding the young birds. The birds also transfer seeds of different plants and thereby play an important role in biodiversity. Additionally, their presence and warble provides pleasure to humans.
Apart from birds and other animals, which are the most visible and easy to observe, the orchards are also home to lichens. In old apple and pear trees on the Vistula River Valley, scientists have found up to 43 species of lichens, among others *Physconia perisidiosa*, *Cetraria chlorophylla*, *Physcia dimidata* and *Evernia prunastri*, which are listed in the national Red List of Lichens. The main role of lichens in nature is the storage of water, which protects the trees in periods of drought, but scientists have also discovered that lichens possess antibiotic abilities, which play an important role in plant protection. In the blossoming time many pollinating species are present in orchards, among them 14 genus and 13 species of bees and many species of bumble

bees *(Bombus)*. It is obvious that such diversity of species can only be achieved and further enhanced by organic methods. There is no need to use pest protection products due to the natural resistance capacity of old varieties, no use of herbicides on the soil, which is mostly covered by wild grasses and herbs, and there is very limited pruning, because of the height of the trees, reaching up to 7-10 metres in case of apple trees and 15-20 metres in the case of pear trees. Of course this wouldn't be possible in modern conventional orchards, with trees of 4 metres height and sprayed several times by pesticides.

Historical fruit orchards

It is extremely important to protect and at the same time use the old orchards. The Convention on Biological Diversity and the International Treaty for Plant Genetic Resources for Food and Agriculture define two methods for protecting genetic resources: *ex situ* and *in situ*, which should be and are being implemented in parallel in order to preserve old species and varieties. There are regions in Poland, where on the basis of old orchards scientists have started working on the protection of ancient varieties, using in *situ* protection methods and using local traditions to generate new tourist businesses.

The first project on the in situ protection of old orchards was developed in the Chełmiński and Nadwişlański Landscape Park[3] (Zespół Parków Krajobrazowych Chełmińskiego i Nadwişlań skiego) in the region near Bydgoszcz, in Lower Vistula Valley, where many old orchards and fruit trees were planted alongside the roads before Word War I. From over two thousand small orchards in that region today only about 500 of them have survived. The Landscape Park identified about 80 varieties of apples and nearly 30 varieties of pears, many of them of German, English or Russian origin, such as: 'Grafsztynek', 'Pepina Ribstona', 'Boiken', 'Piękna z Boskoop', 'Kaiser Aleksander', 'Worcester-Pearmain', 'Lane's Prince Albert'. The fruits were used for domestic consumption and processed for the wintertime. In the villages in the region of Lower Vistula Valley it was a tradition to cook plum jam, which was cooked without sugar, mostly in copper pans on the fire in the orchard. After three days of cooking on a small fire and stirring with big wooden spoons, the jam was stored in stoneware pots in the cool basement, for up to three years. Recently, the Landscape Park developed that nearly-forgotten tradition into a Festival of Plums, which is now one of the most important tourist attractions of the region, connected with the fair of regional and organic products. Nearby in Ciechocin, an organic processing plant, Bio Food, established by organic farmers and processors, produces a wide assortment of fruit and vegetable products.

Similar projects have been implemented in an arboretum in Bolestraszyce near Przemyśl in South-East Poland. In the arboretum in Bolestraszyce a few hundred apple trees were collected from disappearing small orchards in South Poland. The apple varieties are typical for the Carpathian region, sometimes of Ukrainian or Russian origin. They are now mostly grafted on seedlings of 'Antonówka', but in the past the trees in the Carpathian villages were grafted on wild seedlings of Wild Apple *(Malus silvestris)*, of which the trunk can reach a circumference of 300cm. The oldest trees survive in small gardens on the hills in the Carpathian villages, where there are no professional fruit orchards. The apples of ancient varieties were mostly small; in case of early varieties sweet and difficult to transport and store, or, in case of later varieties with strong sour taste, which got milder with longer storage.

Conservation by consumption

The orchards were planted not only in villages, but also outside of the city walls in ancient cities. The trees from small orchards brought sweet-cherries in the early summer, – followed by cherries and plums, pears and apples in autumn, and finally walnuts during the wintertime. The modernisation of Polish agriculture and availability of new varieties caused a loss of many species and cultivars. But villages still exist where old orchards survived the industrial trends in agriculture during the communist era and are now important starting points for the development of new businesses.

In the Lower Carpathian region old, small orchards are the basic source of apples for processing for organic apple juice and apple juice concentrate, with a unique taste because of a very good balance of sugar and acid. The old trees, planted mostly behind their houses by the fathers or grand-fathers of the farmers are now maybe 40-60 years old. They are still bearing fruits, and don't need to be sprayed with plant protection products because they are very resistant to insects and pests. The orchards are like botanical gardens with a collection of old varieties such as 'Reneta Szara', 'Kosztela', 'Glogierówka', 'Kaiser Wilhelm', 'Boiken', 'Malinowa Oberlandzka', 'Grochówka' and many other, nearly forgotten, varieties. From one 50-year-old tree you can harvest 1 to 2 tons of apples. A handful of companies purchase and process organic apples, as well as sell the final products (e.g. Bioconcept Gardenia and Symbio, selling organic fruit and vegetable products on the national and international market[4]).

These examples show the value and need for re-discovering and using local biodiversity and traditions for modern businesses, and connecting nature protection with the expectations of the most demanding consumers.

Credit Anna Wyrzykowska

Credit Tomasz Stasiak

Credit Dorota Metera

Simplifying the complicated subsidy systems

Two measures of the agri-environmental programme could be used for the support of orchards of old varieties. One measure, "Organic agriculture", is widely used for the support of fruit trees and shrub plantations, mostly young and not necessarily bearing fruits. In 2009 the Polish Ministry of Agriculture and Rural Development published two regulations setting the minimum number of trees and shrubs in the agri-environmental programme for "Organic agriculture". To be eligible for the subsidy provided for organic orchards one must have 125 apple trees, 125 cherry trees, 300 plum trees or 75 walnut trees per hectare. This is where the problem lies, because in such fruit orchards, very popular especially in the south part of Poland, the grandfathers and fathers of today's farmers planted only a few trees of each species. It is therefore rather unlikely that one will find 125 apple trees on such a diverse orchard. The different species were planted mostly at a distance of 8 to 10 metres, so one will for sure find 125 trees, but of very different species. For such orchards the farmers will get only half the subsidy – approximately €200 per hectare, while for unified plantations of one species the payment is double - approximately €400 Euro per hectare. The small farmers cannot understand why they are being punished for their old and diverse orchards. To improve the system the subsidies should be applied to all old orchards, but not directly to orchards of the same species.

The other measure of the agri-environmental programme, "Traditional orchards", is very limited in its application, as it foresees a subsidy of about €250 only for 0.4 hectares per farm per year. To apply for that measure the farmer is obliged to pay the average price of €120 for "Agri-environmental plan" for five years. Because the calculation is not really attractive only approximately 1,200 farmers applied in 2009 for that measures (of a total of 100,000 farmers participating in the agri-environmental programme). One solution to improve the participation of farmers in the agri-environmental programmes to support old orchards could be increasing the acreage eligible for support from 0.4 hectares to 1 hectare.

[3] For more information on the landscape park, the following websites might be useful (in Polish): http://www.dolnawisla.pl • http://www.powidla.pl

[4] The websites of the companies processing these products can be visited here: http://www.biofood.pl • http://www.bioconcept.pl • http://www.symbio.pl

Part II: Farming

5. Organic production and agrobiodiversity conservation in the region of Murcia (Spain)

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Abstract

*This article describes one initiative of the Agroecology and Ecodevelopment Network of the Region of Murcia (RAERM), to collect, maintain and enhance the agricultural biodiversity of one specific territorial area. The initiative consists of the creation of so-called **Agroecological Sightseeing Sites** to preserve the most relevant agricultural territories from the point of view of agroenvironmental, socioeconomic and cultural sustainable development. An analysis of all the processes involved in revitalising these aspects from seed to the marketing of the varieties is presented. Finally, the article underlines the need to use all tools available to promote the partnership between producers and consumers who work to keep the rural agriculture livelihoods alive with an agroecological orientation.*

Keywords: Agricultural landscape, genetic resources, peasant culture, agroecology, conservation

Introduction

The transformation of traditional agriculture to other industrialised types of farming has affected agrobiodiversity very negatively. The reasons for this lie in the replacement of local varieties by other commercial varieties, ignoring local or regional breeding programmes to improve varieties; and the homogenisation of agricultural systems through monocultures, encouraged by the current legislation and an EU agricultural policy that is more oriented towards developing conventional agriculture. The most serious consequences of this prevailing agricultural system are: a high rate of genetic erosion, rural depopulation, and disruption of family units, abandonment of peasant and family farm structures, as well as eroding the biocultural memory *(Egea et al, 2010a)*. Also in organic production the use of local varieties is still low and has to be improved. *(Gonzalvez et al, 2008)*

This loss of agricultural biodiversity is a non-reversible process that poses a serious threat to the stability of ecosystems, the development of agriculture and food security *(FAO 2008)*. The Region of Murcia, just like any other area in the world, is not immune to agrobiodversity destruction. According to published data, most varieties of the region are critically endangered (41%), and are conserved only in Germplasm Banks (21.9%), or extinct (13.4%). Only 12.9% is marketed locally, regionally and 5.2% regularly sold nationally and internationally. The agricultural heterogeneous lands with diverse natural and cultural resources are becoming increasingly scarce *(Egea F & Egea S, 2010)*.

The Agroecology and Ecodevelopment Network of the Murcia Region (RAERM) started a participatory research process in 2004 (involving farmers, consumers, engineers and scientists) focused

on the recovery, conservation and revalorisation of agricultural biodiversity, to counteract this genetic, landscape and cultural erosion, with the aim of contributing to rural agroecological development. The specific objectives pursued were: a) to define, describe and valuate Agroecological Sightseeing Sites; b) to retrieve, characterise and select local varieties in organic cultivation; and c) to produce and promote the marketing of selected local varieties.

Agroecologial Sightseeing Sites - Lugares de Interés Agroecológico (LIAs)

LIAs are defined as "areas of traditional cultivation, with a high diversity of genetic resources, which have contributed significantly to the socioeconomic development of the territory and to the preservation of relevant cultural elements linked to the history and landscape of the site" *(Egea F & Egea Sánchez, 2006)*. In the Murcia Region a variety of areas have been identified, described and evaluated as LIAs: small gardens close to small streams and mountain springs, old gardens/orchards under peri-urban pressures in Murcia, the Valle de Ricote (an oasis that holds numerous remnants of its Arabic past) or the Coto arrocero de Calasparra (Calasparra rice) with a unique crop management due to orographic conditions not favourable to mechanisation, being the second-largest wetland in the Region of Murcia. Furthermore, old vineyards located in mountainous areas with small family wineries, terraced hillsides of almond and cereal steppes essential for the maintenance of protected steppe birds have been identified and described.

Credit José Ma Egea

The different areas analysed were evaluated according to their condition, their ecological function and their cultural heritage. The criteria considered were categorised in four categories *(Egea F & Egea S, 2010b)*: a) agricultural and cultural heritage, b) ecological and landscape heritage, c) agriculture and cultural functionality, d) ecological and landscape functionality. Each category was assigned a maximum score of 25 points, with the sum of all categories adding up to 100 points. Each criteria can be assigned a value from1 to 5 points (from very bad to very good, respectively).

Recovery, characterisation and selection of local varieties

One of the aims of the study is to contribute to the creation of a region-wide movement to restore, conserve and select genetic resources in danger of extinction, and the biocultural memory linked to the use and management of these resources. The main actions and achievements have until now focused on plant varieties and can be summarised as follows:

Part II: Farming

1. Recovery of seed and farming culture. A network has been established in 2004 involving several researchers from research institutes, technical advisors, agricultural enterprises, farmers, consumers and other associations. The network's activities have focused on the collection of seeds, mainly in the LIAs, and linking rural communities to the design and management of the agrarian space (via semi-structured interviews). Parallel to these actions, the genetic materials from the Murcia Region, kept in Germplasm Banks all over the country, have been rescued.

2. Varietal and agronomic characterisation of local varieties. Rescued seeds were grown under organic production systems on fields of farmers associated with the project, as well as public research fields. This enabled the identification of intraspecific variability available in the region and its response to organic farming.

Credit José Ma Egea

3. Selection and multiplication of varieties. For the selection of varieties, as well as the agronomic performance, the views of experts and consumers were taken into account. To do this, tasting events were organised, with the purpose of selecting productive local varieties of high organoleptic quality. At a later stage, an analysis of the nutritional quality of these varieties is planned. Seeds of the selected varieties have been multiplied and placed for conservation in the Local Seed Bank at the University of Murcia, managed by the RAERM.

Production, marketing and consumption of selected local varieties

Agricultural biodiversity loss can only be stopped by adapted consumption patterns. Therefore, a key element is to raise public awareness about responsible consumption that will enable the conservation of all aspects of agricultural landscapes, including humans. The actions taken to date by the RAERM were:

1. Promoting the production and consumption of local genetic resources. In order to stimulate and promote the production and consumption of local varieties in the region, various events (trade fairs, technical seminars, tasting events,...) have been organised including the exhibition and sale of organic local varieties, live cooking with tasting, and workshops about peasant culture linked to these varieties. Furthermore, the Centre for Agroecology and Environment (CEAMA) devoted to, among others, research, training and the dissemination of farming practices to local varieties and other activities, has been set up. *(Egea F et al. 2008)*.

2. Producer and/or consumer networks for local organic products. The final stage of the process initiated by the RAERM in 2004 is the organic production and marketing of selected varieties. To meet this objective, seeds and stock were distributed free of charge to various associations of producers and consumers of organic food. Also, the maintenance of a database of contacts of various restaurateurs in the region of Murcia has been kept, in order to boost tourism-based gourmet food from local varieties and breeds. Currently, networks among organic farmers (or traditional farmers under a Participatory Guarantee System), located in the LIAs, are being set up, who produce or are interested in producing local varieties in danger of extinction. The first initiative, "from farm to campus", has already begun. This is to encourage responsible consumption among members of the University of Murcia, through the sale of organic products (Box schemes - ecocajas), including selected varieties produced in the LIAs in the context of family farming.

Final remarks

The Agroecological Sightseeing Sites (LIAs) are important areas of the agricultural landscape that have remained alive and diversified over centuries, and have been imbued with an environmental, socioeconomic and/or cultural value. Its preservation is necessary to contribute to food security and food sovereignty of the planet. It is therefore necessary to urgently develop policies to protect and manage LIAs together with farmers. Its presence in the countryside and its commitment to the environment are absolutely essential to preserve the agricultural and natural biodiversity, and to at the same time generate activities and jobs for the rural population.

The biodiversity conservation and rural development programmes have to promote the proposed lines of action related to the recovery and valuation of agrobiodiversity. Among these measures, it urges to promote partnerships between producers and consumers or other market structures, which give value to genetic resources, agricultural landscapes and to the rural culture that is in danger of going extinct. The implementation of some of the expected instruments in the Common Agricultural Policy, such as the payment for environmental services, can help to maintain and restore the agricultural landscape with all its components.

6. Sustainability Flower: concept and tool for a vivid and clear sustainability performance

Eosta

www.eosta.com

The concept of the Sustainability Flower was developed by a group of companies from the organic movement to provide a set of indicators and a platform to assess, improve and communicate the sustainability performance of the various stakeholders of organic supply chains. The companies involved in the development and implementation of the Sustainability Flower are from Egypt, Germany, India, The Netherlands and the UK, and cover all levels of the supply chain and all sectors of industry within the organic movement.

The Sustainability Flower is based on three societal indicators: social, cultural and economic life, as well as six environmental indicators: soil, water, air, energy, animals and plants. All nine dimensions are linked to specific key performance indicators which are in compliance with the requirements of the Global Reporting Initiative (GRI), and any organisation wishing to use the Sustainability Flower has to report performance on all indicators in order to avoid single-issue marketing as opposed to a holistic and comprehensive sustainability strategy.

The Sustainability Flower has been developed to serve as a tool to stimulate and monitor progress and improvement and is not a certification scheme. The implementation, further development and compliance is coordinated and supervised by an advisory board. Currently, the Flower is undergoing a pilot study in order to be used as a voluntary best sustainability practice guideline in addition to the organic standards.

As one of today's key agricultural challenges is soil fertility and biodiversity loss, the currently undergoing pilot implementations mainly focus on the issue of soil fertility and natural disease resistance of soils and plants through enhanced biodiversity – specifically microbial life in soils.

Biodiversity in the Sustainability Flower

Next to microbial life in soils, animals and plants are also used as biodiversity indicators for the Sustainability Flower.

The main focus is to measure an organisation's impact on local biodiversity and habitats, its activities to reduce its impact on biodiversity, and whether the organisation is carrying out projects to actively stimulate biodiversity within its sphere of influence.

Part III: Processing

Biodiversity is a very complex and not well-defined issue yet. Following the general approach of the Flower to foster improvement, the impact on biodiversity is initially assessed applying simple and easy to implement measures such as fallow land per farm, the area of active, not disturbed habitat an organisation sets aside, etc., but will soon be followed by more detailed and specific monitoring such as species count, etc. as soon as more appropriate and advanced tools become available.

An intact biodiversity and habitat is one of the key elements of organic farming, as it allows soils, plants and nature to develop a balanced system, naturally manage stress such as diseases, droughts, floods etc. It must be of utmost importance for the organic movement to continuously monitor and improve its impact on biodiversity.

Eosta, a leading international distributor of organic fresh fruits and vegetables, applies the Sustainability Flower on its Nature & More trace-&-tell system as a web-based navigation tool to communicate the ecological and social performance of its allied growers. The Sustainability Flower gives the consumer an insight into all the relevant factors regarding environmental and working conditions for each product. www.natureandmore.com

Part IV: Retail

7. Biodiversity and the consumer

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Abstract

Coop is the second-largest Swiss retailer. It has invested in organic production since the early nineties. In the last ten years Coop has extended its product range further and now carries 8 sustainable own brands and 4 sustainable certifications. In the UN-declared international year of biodiversity, Coop has intensified its communication efforts on the topic to sensitise the population and foster more sustainable consumption patterns.

Introduction

As a cooperative with 2.5 million members, Coop has the mission to secure the supply of everyday commodities. For a long time, this was no problem. Procurement managers could choose from a multitude of suppliers and products. But resources such as water, biodiversity, fertile cropland, fish stock, etc. are starting to run short, and consumers are demanding that suppliers and producers make their processes more sustainable, thereby determining the conditions of transaction. Also, insecurities, especially in the agricultural commodity market, are increasing due to climate change and decreasing biodiversity, amongst others. To secure supply over the long term, retailers have to rethink how they source inputs and the product range they should offer.

Every day, 1 million people visit our stores. With its assortment, Coop has the opportunity to offer its consumers a healthy, sustainable product range and thereby creating a large leverage effect to influence environmentally-friendly consumption.

Biodiversity at Coop

In the last 50 years farmers have been using more and more intensive agricultural practices to boost yield. This has led to the degradation of agricultural and semi-natural ecosystems and caused the decline of biodiversity in large areas. Scientific studies show that organic farming is much more conducive than conventional methods to biodiversity. For instance, organic farms provide habitats for 50% more individuals, on average, and 30% more species and varieties of animals and plants – owing in part to a more varied crop rotation and the fact that they do not use artificial fertilisers or synthetic-chemical pesticides (Bengtsson, Ahnström, Weibull, 2005). Moreover, the proportion of semi-natural land on organic farms is 50-70% greater, depending on the altitude (Gibson et. al., 2007). The ecological compensation areas it creates are an important refuge for many species. Acknowledging that organic production assures better sustainable management of resources and can increase biodiversity, Coop decided to opt for it.

The company fosters organic agriculture at various levels. It established a close partnership with the Swiss organic farmers association Bio Suisse and launched the organic brand Naturaplan in 1993. The more than 2,000 organic products certified with the Bio Suisse bud label meet far higher standards than the minimum legal requirements for organic products. The Coop brand Naturaline stands for organically-produced, fairly-traded cotton textiles and supports some 10,300 organic farmers in India and Tanzania. Coop Oecoplan offers numerous natural alternatives to the pes-

ticides and artificial fertilisers that are often used in large quantities in private gardens. Organic seeds and seedlings, natural fertilisers, peat-free soils and intelligent use of natural plant protection agents enable the number of semi-natural areas with a high level of biodiversity to be increased in inhabited areas. Coop endows 15 million Francs a year to its Coop Sustainability Fund. It is a key tool for promoting innovation in the field of sustainable consumption. Amongst others, the fund promotes research projects of FiBL since 1992, one of the world's leading research organisations in the field of organic farming.

In 2010, on the occasion of the International Year of Biodiversity, Coop intensified its communication efforts on biodiversity. In collaboration with Swiss rapper Stress, Coop produced the song "C'est réel" for a TV-commercial which heralds a wake-up call for the biodiversity crisis. The lyrics are about nature's heartbeat and the last domino that mustn't fall. To include its consumers, Coop launched a large-scale participatory campaign focused on the importance of biodiversity. The campaign includes hands-on action enabling customers to sow wildflower seeds of endangered species. For each participant in this campaign, Coop pays an amount equal to saving 1 m2 of dry meadows to Pro Natura, the biggest Swiss environmental protection association. Together with its partners Bio Suisse and FiBL, Coop organised open days at 50 organic farms for families to give them an understanding of biodiversity in a playful way.

Credit Coop

Achievements

By making organic products available to the broad population, organic agriculture stepped out of the niche. Today, Switzerland has the second highest per-capita expenditure for organic products. As for Coop, 8% of the food sold in its stores is organic, and more than 2,000 organic food products in its assortment are labelled with the bud of Bio Suisse. Annual sales of Coop organic cotton products have increased to 65 million Swiss francs in 2009.

As for the biodiversity campaign in 2010, consumers' awareness of biodiversity has increased in just a few months since the launch. 1,300,000 packages of wildflower seeds of endangered species have been distributed. Coop paid for the preservation of 280,000 m2 of dry meadows in Switzerland and received many positive reactions to the campaign. Many hobby gardeners were proud of their wildflowers and posted a photo on the Coop website. Others started to grow their virtual wildflowers and spread the word in their social media communities.

Our insights

1. Sustainable products are demanded by consumers. They do, however, have to be promoted accordingly.
2. A retailer must not limit itself to organic foodstuffs. To be credible, it should promote sustainable products along the whole assortment (garden, textiles etc.).
3. The commitment to organic and sustainable products has to be long-term.
4. Governments should take steps to promote sustainable and organic products, especially in government-run facilities such as hospitals, schools, elderly homes, etc.

Coop is committed to and plans to further extend its organic and sustainable product range. The retailer is convinced that it is the path of long-term growth.

Part IV: Retail

8. Biodiversity and certification – can the two be combined?

Experiences from the sector Cooperation on Biodiversity and Organic Agriculture in Sweden.

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Introduction

Organic agriculture has many times shown to be favourable to biodiversity, but there are many farming practices which do not favour biodiversity and are also used in organic farming, thus to better serve the organic principle of ecology further improvements should be envisaged.
Which practices should be adopted by organic farmers to better serve the goal of biodiversity enhancement and conservation? What does this imply for the farm system? And how can these practices be translated into standards and the certification system? This was the background to the project on Sector Cooperation on Biodiversity and Organic Agriculture in Sweden with the goal of identifying methods on the farms and developing standards for certification of issues related to biodiversity.

Setting up the project

The project on Sector Cooperation on Biodiversity and Organic Agriculture was run over a six-year period with a multi-stakeholder group with representatives from farmers, advisers, researchers, conservation organisations and organic certification bodies. The group started with quite a long period of knowledge exchange on biodiversity issues which in one way or another had a relation to organic production.
The first lesson learnt by the group was that there were many more initiatives on conserving and enhancing biodiversity in Sweden which were interesting for organic production than anyone had expected, even if very little of the investigation, research or other development going on was directly oriented to organic production.
The second lesson was that a lot of knowledge was needed to understand one's own and other group members' objectives, roles and actions to conserve and enhance biodiversity. One example is the harvesting of silage, and the conflict of an early harvest resulting in high–quality silage in relation to birds breeding in the ley being killed by harvesting machines.
The third lesson was that there were possibilities to escape the requirement of maintaining enhanced biodiversity on certain areas of the farm such as low-input grasslands, should organic standards require a farmer to complete a lot of actions to promote biodiversity. Farmers might simply rent out those areas with the highest value for biodiversity and often a low economic value, and also the highest work burden to maintain this biodiversity, to neighbours. The area would then not count anymore as area belonging to the organic farm, and biodiversity might decrease due to abandonment or land use change.

Part V: Certification

The role of farmers

From these and several other observations the understanding was derived that for the conservation and enhancement of biodiversity on a farm, the understanding, knowledge and interest of the farmer is the core issue. If the farmer has the knowledge and the willingness a lot can happen on the farm to promote biodiversity. If someone is just forced to do a specific action for biodiversity without having the understanding why, it will be a failure. This is similar to what can be said of organic farming in general: it has to be done with a strong wish to do so; there has to be an inner drive, which can be to make the world better, to care for soil and animals, for fun, to earn money or many other things.
There were also other lessons learnt through the project which are described in the IFOAM publication Organic Agriculture for Biodiversity. *(Stolton, 2004)*
One of the desired outcomes for the project was to formulate biodiversity standards for organic farmers in Sweden. To give the reader a background on the context in which a biodiversity standard was to be set up, it is necessary to describe farming in Sweden briefly. Sweden is an elongated country with variable conditions for farming. When farmers in the south get prepared to harvest the first silage the snow has just melted in the most northern potato fields. In the south and on the plains there is a relatively intensive farming system with crop rotations of grain and rapeseed while in many other, more forest-rich areas milk and beef production are dominant. Fruit orchards are uncommon, while there is quite some potato, onion and carrot production. Organic production is more common in the milk and beef-producing regions, and less in the most intensive grain areas. Some of the most diverse areas in Sweden are natural meadows which have never been ploughed or chemically-fertilised and where grass is harvested or grazed. The farmed area is decreasing in less–productive areas, and often biodiverse land is replanted with forest. Overgrazing is almost never a problem, while the opposite is quite common.

Implementation of the project

The learning in the stakeholder group and the conditions for organic agriculture set the background for the discussion on how to incorporate standards on biodiversity in the KRAV organic standards. Standards on biodiversity in organic production can be done in at least two different ways:

1. By decreasing the intensity of the production for part of the land, for example by setting apart a percentage of land which should not be farmed and/or a possible restriction on grazing livestock density.

2. By giving the farmer an understanding and knowledge about biodiversity, which kind of biodiversity features are on the farm, and what kind of strategies and management actions can be taken in favour of biodiversity, in order to come up with a biodiversity management plan that is individually adapted to each farm.

In the discussion on the design of the standard the second option seemed a much better way, especially with the variable farming conditions and the majority of organic farms situated in less intensive areas. At the time of the first discussion, an EU-supported subsidy scheme was in place, where an adviser specialised in biodiversity would visit farms and propose plans for conservation

and enhancement of biodiversity. The requirement to have such a plan formed the main content of the standard. Together with the plan there were a range of recommendations in the KRAV standards about maintaining meadows and pastures, not feeding animals on natural pasture, keeping a diverse range of wild trees and shrubs in grazing land, and not using substances like avermectins.

Biodiversity management plans

Included in the plan were advisory visits to the farms and time for discussion. The plan should cover important parts of the farm but didn't have to cover all fields and areas; the idea was to make something useful and possible which the farmer could handle. There was no requirement that the farmer needed to fulfil the plan. The reasons for this were manifold: fulfilment of biodiversity plans are very difficult to streamline into fair certification decisions, and the intention with the standard was more to inspire creativity, rather than hard tools.

In the mid-2000s quite some biodiversity plans were made, and many farmers received good advice, but later the funding for making the plans ran out. Today, the standard is still kept in the KRAV standards, but as it is a recommendation, few plans are actually carried out. Maybe it can be seen as a failure, but many farmers learned more about biodiversity. Hopefully, farmers who have learned about the values on the farms also continue to protect what often was created by parents and grandparents, and transfer it to the coming generations.

There are also other projects which have sprung up from the discussions in the stakeholder group. One advisory project called "Farmers and birdwatchers in cooperation" teams up interested farmers with birdwatchers, who record the birds sighted on the farms, with the outcomes used by professional advisers for both areas of farming and biodiversity, giving advice to the farmer about how to manage their farms.

Discussion

There is a general decline of many birds, insects and plants in agricultural landscapes and also in organically-managed areas due to the huge changes in farming systems over the last 30 to 50 years, even if organic farms in general are faring better. There is a need to focus on how the decline in general can be stopped, and how that is to be handled by the Common Agricultural Policy of the EU. But there is also a lot which can be done on the individual farms by farmers through advice, inspiration and financial support. A third tool is to take specific actions such as lark patches when crops get too dense, leave crops as feed for overwintering birds, and designing farming methods to function better for biodiversity purposes. There is also a need for research in many areas, with one urgent Swedish example being the Ortolan bunting which is rapidly declining and disappearing in the agricultural landscape, and the reasons for this are not yet understood.

What can be learned from the Swedish case is that "hard", certifiable standards for biodiversity are difficult to set. Setting aside a percentage of land is easy to do, but the quality of the unused land can differ a lot. The value of setting aside land can be questionable in a country such as Sweden where farming practices and grazing maintain biodiversity on meadows and grassland. But at the same time, organic grain production develops in quite the same way as conventional, with more winter-sown crops and more dense crops where for example sky lark have problems to breed, and where land set aside in the form of unsown patches in the fields would be quite useful.

Part V: Certification

Soft standards such as having a management plan require a much more specific result to be achieved by the individual farm and farmer, and biodiversity is often very site-specific. As the Swedish case shows, it is very difficult to use or adopt EU regulation or IFOAM basic standards in certification, especially as a part of a much larger system like KRAV. Whereas IFOAM has done a lot of work on biodiversity on a global level with the *IFOAM Guide to Biodiversity and Landscape Quality in Organic Agriculture* as a recent example, the IFOAM basic standards do not contain specific rules for biodiversity management due to several difficulties. The EU regulations for organic food and farming do not include standards on biodiversity and for the above-mentioned reasons will probably remain without those. Only a few private organic standards exist which have detailed biodiversity standards for their producers. The message is clear: biodiversity is a core issue in organic production; and education, knowledge transfer and incentives for farmers are key for biodiversity enhancement on the farm, whereas setting inflexible biodiversity standards in the framework of the organic certification system is not the best way to conserve and enhance biodiversity due to geographical and farm-related differences and specificities.