Ministry of Agriculture and Food Industry of Moldova

GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

Empowered lives.
Resilient nations.

UNDP/GEF Project: "Strengthening Capacities to Undertake an Environmental Fiscal Reform to Meet National and Global Environmental Priorities"

National Study on Organic Agriculture and Greening of Conventional Farming

Chisinau, Moldova - 2014

Contents

EXECUTIVE SUMMARY 3

1 CHALLENGES TO THE SUSTAINABILITY OF THE MOLDOVAN AGRICULTURE 9

1.1 Soil Degradation and Erosion 10

1.2 Water Pollution 11

1.3 Risks from Poor Fertilizer and Pesticide Management 12

1.4 Pollution from Agricultural Waste 13

1.5 Loss of Biodiversity 14

2 GREENING THE MOLDOVAN AGRICULTURE THROUGH THE ECOSYSTEM APPROACH 15

2.1 Soil Health 16

2.2 Crops and Varieties 17

2.3 Water Management 18

2.4 Plant Protection 20

3 ORGANIC AGRICULTURE IN MOLDOVA 24

3.1 Legal Framework for Organic Agriculture in Moldova 24

3.2 National Label for Organic Products 25

3.3 Trends in the National Organic System 26

3.4 Moldovan Organic Farmers with International Certifications 30

3.5 Actors involved in the Organic Sector 31

3.6 Access to Inputs, Technologies and Resources 33

3.7 SWOT for Organic Agriculture in Moldova 36

3.8 Key Programmes and Policies that Can Provide Financial and Operational Support to the Organic Sector Development 37

4 IMPROVING AGRICULTURE SUBSIDIZATION TO SUPPORT GREENING AND GROWING THE ORGANIC SECTOR IN MOLDOVA 40

4.1 Analysis of the Current System in Agriculture Subsidies 40

4.2 Concept Proposal on Improving the Agriculture Subsidies System 43

ANNEXES 46

Annex 1. Organic Agriculture: History, Principles, Benefits 46

Annex 2. The World of Organic Agriculture 52

Annex 3: Global Regulatory and Trade Environment for Organic Agriculture 60

Annex 4. Best Practices in Public Sector Support for Greening the Agriculture 63

Annex 5. Case Studies in Moldovan Organic production and exports 85

Executive Summary

Challenges to the Sustainability of the Moldovan Agriculture

Agriculture remains one of the key economic sectors in Moldova, despite its GDP share having diminished from 27.9% in 1995 to 12.2% in 2013. Currently agriculture employs 28.8% of the labour force. Depending on favourable climatic conditions in a given year, the agro-food exports constitute 45-50% of total exports of the country.

The National Agriculture and Rural Development Strategy 2014-2020 identified a series of challenges to the environmental sustainability of the Moldovan agriculture:

- Water pollution;
- Biodiversity loss;
- Land degradation/ nutrient loss/ erosion;
- Water scarcity/ salinity;
- Carbon footprint;
- Natural resource depletion;
- Increasing frequency of air temperature and precipitation extremes.

Land degradation is a significant threat to the country's land resources. About 2 million ha of agricultural lands are situated on slopes with a variety of degrees of inclination, making them vulnerable to degradation. 877,000 ha (35% of the agricultural land area) are subject to erosion. About 4.6% of the agricultural area was seriously eroded.

The *pollution of water* from agricultural activities, in addition to lack of sustainable water management to protect the resources from pollution from untreated or insufficiently treated wastewater, and industrial activities leads to poor quality of water resources. Drinking water quality is constantly deteriorating. 67% of samples of water taken from the centralized sources of water supply do not meet sanitary standards. The sanitary situation of the decentralized water sources is even worse: 80% of the samples fail to meet standards.

Most farmers apply fertilizers without proper soil and plant tissue tests, so the risks of *over- or under-fertilization* are very high. Most farmers lack basic knowledge of the life cycle of major pests of their crops, and there is an *over-reliance of pesticides*, leading inevitably to their excessive use. Biological control strategies are rather an abnormality than a rule in the Moldovan agriculture.

Greening the Moldovan Agriculture through the Ecosystem Approach

These problems are not exclusive to Moldova; unfortunately they are typical for all farming systems, in which most aspects of production are controlled by technological interventions such as soil tilling, protective or curative pest and weed control with agrochemicals, and the application of mineral fertilizers for plant nutrition.

The international experience suggests that the production systems that take a predominantly *ecosystem approach* are both productive and more sustainable. These farming systems are based on three technical principles:

- Simultaneous achievement of increased agricultural productivity and enhancement of natural capital and ecosystem services;
- Higher rates of efficiency in the use of key inputs, including water, nutrients, pesticides, energy, land and labour;

- Use of managed and natural biodiversity to build system resilience to abiotic, biotic and economic stresses.

The farming practices required to implement those principles will need to adopt three key practices are generally associated with *conservation agriculture*:

- Minimize soil disturbance by minimizing mechanical tillage in order to maintain soil organic matter, soil structure and overall soil health;
- Enhance and maintain a protective organic cover on the soil surface, using crops, cover crops or crop residues, in order to protect the soil surface, conserve water and nutrients, promote soil biological activity and contribute to integrated weed and pest management;
- Cultivate a wider range of plant species – both annuals and perennials – in associations, sequences and rotations that can include trees, shrubs, pastures and crops, in order to enhance crop nutrition and improve system resilience.

However, in order to achieve its objectives, the farming systems need to be supported by four additional management practices:

- The *use of well adapted, high-yielding varieties* with resistance to biotic and abiotic stresses and improved nutritional quality;
- *Enhanced crop nutrition* based on healthy soils, through crop rotations and judicious use of organic and inorganic fertilizer;
- *Integrated management of pests, diseases and weeds* using appropriate practices, biodiversity and selective, low risk pesticides when needed;
- *Efficient water management*, by obtaining "more crops from fewer drops" while maintaining soil health and minimizing off-farm externalities.

The Government of Moldova could support the wide adoption of these farming systems with ecosystem approaches by:

- Targeted investment in research programs, such as conservation farming, precision irrigation, integrated pest management, variety breeding and testing;
- Building capacity through demonstration farms and training programmes for the national extension network, rural development consulting service providers, and farmers;
- Disseminate information and communicate benefits. Any large-scale implementation of soil health management requires that supporting information is made widely available, particularly through channels familiar to farmers and extension workers. As Internet becomes a mainstream communication channel, building an online "Green Agriculture" knowledge-sharing platform is a must;
- Review national regulations for management of natural resources in agriculture in order to better define the requirements and responsibilities for their enforcement;
- Use the Agricultural Subsidy Fund in order to stimulate farmers using environmentally friendly practices and complicate the access to the Fund's resources for the farmers that use practices that pose serious threats to the environment, based on the criteria of the relevant national regulations;
- Improve access to key inputs required for implementing sustainable farming systems, by making investments in the State-owned breeding programs and laboratories for production of biopesticides, and removing selected import barriers for the inputs not available in the country;
- Improved management of the centralized irrigation systems by transferring their management to water user associations and implementing full water cost recovery mechanisms;

- Establish under the National Food Safety Agency a network of automatic weather stations to provide timely, relevant and local weather data to assist growers, advisors and phytosanitary inspectors make more informed decisions;
- Review of policies governing official registration of pesticides, by introducing a stronger linkage with EU norms and regulations in order to exclude the pesticides (active substances) with particular serious harm to health and environment.

Organic Agriculture in Moldova

The Republic of Moldova has established a legal framework for organic agriculture based on EU regulations. Since their adoption, Moldova has updated the key legislative acts several times, but despite the strategic objective to harmonize its legislation with that of EU, the Moldovan legislation lags behind. For example, the detailed rules on organic wine introduced by EU in 2008 weren't yet transposed in the Moldovan legislation. To be able to keep the pace with the changes in the EU system, the Moldovan legal framework has to be simplified by avoiding the duplication of several parts in Law 115/2005, GD 149/2006 and GD 1078/2008.

According to the Moldovan official statistics, *the area under organic agriculture has grown at a steady pace* during the last decade. During 2003-2012, the area under organic crops (both certified and in conversion) went up from 80 ha to 61.280 ha, with a decline to 51.681 ha in 2013 (including 42.327 ha certified organic). In 2012 (the peak year), organic certified area made up to 1.7% of utilized agriculture land in Moldova. Structurally, organic areas were mostly under arable crops (95%), while permanent crops occupy only 3%. For comparison, in Europe the permanent crops have a much larger relative share - 19% of the organic cropland area.

The number of certified and in-conversion organic farmers has grown with 60% CAGR during the period 2003-2009, reaching the peak of 185. Since then, *the number of farmers covered by the National Organic Certification System is in permanent decline*, decreasing three-fold during the last 4 years. The apparently contradicting trends – growth in area under organic farming and decline in the number of organic farmers – are explained by the abandonment of the organic farming by a significant number of smaller farmers and emerging of a few large companies producing arable crops for export markets.

A key reason for abandonment of organic farming by smaller growers is *the under-development of the local market of organic products*: the general consumer lacks essential awareness about what "certified organic" means, while the food retail practically ignores the organic products. As result, most farmers can't obtain higher prices to justify the increased unit costs generally associated with organic farming. The "Register of economic entities involved in the organic agrifood sector" which is maintained by MAFI is not available online, and thus an opportunity to connect the organic farmers to the market is missed.

A significant number of exported-oriented companies have selected to be certified by EU-recognized inspection bodies and, as they don't sell their products to the local market, are not inspected by a local inspection body and are out of the National Organic Certification System. MAFI is aware about their activities, but hasn't implemented a consistent system of collecting data about these companies.

Within the Ministry of Agriculture and Food Industry, a special unit was created to support the development of the organic farming – the "Organic Farming and Products of Origin" Service. The Service initiates the development of the pertaining regulations, leads the Commission for authorisation of inspection and certification bodies, maintains the Register of organic farmers, and coordinates the public policies in the field of organic farming through a sector development program.

Moldova has a series of R&D institutions with activities directly related to organic farming, the major one being the Institute of Genetics, Physiology and Plant Protection which passed through several stages of reorganizations and mergers. There is a great *need to improve the efficiency of the research*

program, as frequently research findings are not translated into practical tools for application in their farms.

The current organic growers and the potential entrants complain of *limited access to the key inputs* for their operations, such as seed, fertilizers, and technologies because of restricting import regulations. Most of the key inputs require some sort of pre-registration by the company placing them on the market, and this is not regularly done because of the limited attractiveness of the Moldovan market for the international suppliers. *The improved access to key inputs is the PREREQUISITE for any significant increase of the share of perennial crops in the Moldovan organic agriculture, including organic fresh fruit production.*

Based on this analysis and building upon the achievements already accomplished, the Government of Moldova should update its National Program regarding Organic Agrifood Products (approved as part of GD 149 of 10.02.2006) along the following strategic directions:

Objective 1. Information-led development of the organic food market, by increasing consumer awareness, providing more information and promotion to consumers and operators, stimulating the use of the national organic logo, providing more transparency to the local and foreign buyers, and improving the availability of production, supply and demand statistics as policy and marketing tools;

Objective 2. Improvement and reinforcing of the national organic farming regulations, import and inspection requirements, increasing transparency and consumer confidence, and increasing the efficiency and transparency of the inspection system;

Objective 3. Improving the access of the farmers to the inputs, technologies and resources;

Objective 4. Making public support for organic farming more effective by a more coherent support from the Agriculture Subsidy Fund and National Ecologic Fund, and by strengthening research on organic farming.

Specific actions required for Objective 1:

- Re-design of the current national organic logo;
- Approval by the GoM of the regulations regarding the use of the national organic logo;
- Clarify the institution responsible for the official control of the local market regarding the use of the national organic logo and the use of wording “bio”, “eco”, “organic” for agrifood products;
- Establish a private-public partnership between MAFI and the Organic Farmers Association for the management of the national organic logo;
- Create a website under direct control of MAFI explaining to the consumers the concept of certified organic farming and listing the Moldovan organic farmers;
- Implement annual consumer information campaigns with support from the National Environmental Fund;
- Develop generic business plans for growing, processing and marketing of various organic crops and mixes thereof, to demonstrate to farmers and potential investors the existence of markets and the economic feasibility of organic agriculture in Moldova.

Specific actions required for Objective 2:

- Recognize the equivalence of the inspections and certifications performed by EU-recognized certification bodies in the Republic of Moldova. This will avoid unnecessary costs for the export-oriented growers and will allow a better monitoring of the national organic sector;
- Further harmonisation with EU regulations, preferably on an annual basis to avoid big discrepancies between Moldovan and EU regulations. This will include completing the standards for areas not yet covered, such as wine;

- Adopt EU approach regarding the frequency, timing and duration of inspection and certification visits;
- Review the rules governing the inspection and certification bodies and perform an audit of their enforcement in order to avoid conflicts of interest;
- Apply for and obtain the status of "Authorized Country" by the European Union (Commission Regulation No 1235/2008) by demonstrating the equivalency of Moldovan regulations and control system with those laid down in EU.

Specific actions required for Objective 3:

- Introduce import derogations for seed varieties imported by the organic farmers for the cases when the local market doesn't offer similar-performing varieties and the required variety is not included in the National Catalogue of Plant Varieties;
- Introduce import derogations for biotechnologies to be used by organic farmers that are not included in the State Register of Crop Protection Means and Fertilisers;
- Create a website listing and describing the practices and technologies available in Moldova that can be used by the organic farmers and the conventional agriculture farmers wishing to increase the sustainability of their operations. Additionally, provide contact information of the researchers and crop advisors that offer implementation support;

Specific actions required for Objective 4:

- The current system of top-up subsidies for enlarging of organic agriculture areas should be maintained;
- Based on the model of EU, introduce conversion and maintenance payments for certified organic growers as payments for ecosystem services and benefits they provide. The payments will be disbursed by AIPA and funded from the resources of the Agriculture Subsidy Fund and/or National Environmental Fund;
- Strengthen research on organic farming by:
    - Focusing the R&D efforts on the priority directions discussed with the private sector;
    - Putting more focus on the implementation aspects of the R&D activities;
    - Improve coordination of the R&D institutions with Agency for Innovations and Technology Transfer.

Improving Agriculture Subsidization to Support Greening and Growing the Organic Sector

Agricultural Subsidy System is a key tool to support implementation of the agricultural policies of the Government of Moldova. Since its establishment, Agricultural Subsidy Fund passed through a trial-and-error process with several support measures, before coming to the current set of 10 support measures backed in 2014 by a budget of 500 million MDL (around 27 million EUR). "Efficient utilization of natural resources and environment conservation" is one of the major objectives of the support provided through the Agriculture Subsidy Fund. This is achieved by:

1. Increased support to organic growers (higher support rates for organic growers are included in 3 out of 10 support measures);
2. Increased support for the procurement of agricultural machinery that could be used in conservative agriculture operations;
3. Eligibility of support for some agriculture machinery used in soil conservation and waste management operations;
4. Requirements for the presence of the State Ecological Assessment (expertiză ecologică de stat) for the newly constructed post-harvest and processing units and cattle farms.

The first priority for the "greening" of the Agricultural Subsidies System is *to abolish or modify those that clearly promote unsustainable practices* or demotivate farmers from applying environmentally-friendly practices and technologies. For example, it is recommended to apply a fixed subsidy per cubic meter of pumped water (as opposed the current reimbursement of a share of electricity pumping costs) in order to motivate farmers to invest in energy-saving water pumping solutions.

Currently, by not linking the subsidies with the mandatory legal environmental requirements, the Government misses an opportunity to promote environmentally-friendly practices and technologies. It is recommended to *introduce the cross-compliance mechanism* using the model of the European Union. Under this model, the subsidy is decreased or not approved if the farmer fails to meet any of the major mandatory environmental requirements.

All environmentally-friendly technologies or technical solutions enabling better farming practices should be eligible for Agricultural Subsidies System. The governmental institutions rejected the inclusion in the Agricultural Subsidies System of some innovative solutions (such as weather stations and mechanical thinners) solely because they are rarely used in Moldova. On the contrary, the *subsidies should be used to introduce and promote new environmentally-friendly approaches*.

Another "market smart" subsidy that should be included in the Agricultural Subsidies System is *area-based subsidy for organically-cultivated land*, as payment for environmental services provided by the organic farms. This measure should be available for both in-conversion and certified farmers. A differentiated scale per type of crop should be adopted, based on the model of the European Union.

Currently the Government of Moldova (Ministry of Agriculture and Food Industry, AIPA, and the Ministry of Environment) implements the Moldova Agriculture Competitiveness Project (MAC-P) funded by the World Bank and the Global Environment Fund. One of the project's components provides financial support in the form of *matching investment grants to farmers for piloting the adoption of sustainable land management practices*. After the first round of disbursement of the matching grants is completed, it is recommended to review the program in order to permanently introduce a similar measure in the Agricultural Subsidy System covering the entire spectrum of sustainable practices. The best approach would be to have a roster of accredited service providers (consultants) that develop environmental management plans for interested farmers, and AIPA to agree to provide subsidies for the measures included in those plans.

1 Challenges to the Sustainability of the Moldovan Agriculture

Agriculture remains one of the key economic sectors in Moldova, despite its GDP share having diminished from 27.9% in 1995 to 17.4% in 2003 and further to 12.2% in 2013[1]. The agro-processing industry (including beverage and tobacco industries) contributed another 7.9% of GDP in 2013. Currently agriculture employs 28.8% of the labour force. Depending on favourable climatic conditions in a given year, the agro-food exports constitute 45-50% of total exports of the country.

The detailed analysis of the current situation included in the first part of the recently approved National Agriculture and Rural Development Strategy 2014-2020 identified the major challenges to the environmental sustainability of the Moldovan agriculture:

- Water pollution;
- Biodiversity loss;
- Land degradation/ nutrient loss/ erosion;
- Water scarcity/ salinity;
- Carbon footprint;
- Natural resource depletion;
- Increasing frequency of air temperature and precipitation extremes.

INFOBOX: Climate Change Exposure and Risk for Moldova

Agriculture is extremely important for rural livelihoods in Moldova, with more than 41% of the population employed in the sector. Agriculture is also a highly climate sensitive sector, and as such, much of Moldova's rural population and livelihoods are vulnerable to climate change. Historical data indicate that Moldova is exposed to a highly variable climate that has already experienced an increase in mean temperature, moisture deficits and extreme events, like droughts, floods and frosts. Climate projections for the future indicate that Moldova likely will be exposed to:

- *A 3.4^{0}C increase in mean annual temperature for the 2040-69 period, with the greatest warming projected to occur in autumn and winter*
- *A decline in mean annual rainfall by 6.8% for the 2040-69 period and a decline in mean rainfall for summer and autumn by 19.3% and 16%, respectively*
- *An increase in the frequency and severity of drought, with the probability of catastrophic drought (less than 50% of mean rainfall) increasing from one event in nine years to almost one event in two years*
- *A more marginal and risky agricultural production environment, as increases in temperatures and reduced precipitation during critical crop and pasture growth periods will cause a moisture deficit, significantly shifting the country to a dry sub-humid or semi-arid climate.*
- *An increased exposure to new pests and diseases for agricultural crops, forests and livestock due to temperature increases.*

Source: Capcelea Arcadii et. all. The Republic of Moldova. Climate change and agriculture: country note. World Bank, November 2010

[1] National Bureau of Statistics, http://www.statistica.md/newsview.php?l=ro&id=4350&idc=168

1.1 LAND DEGRADATION AND EROSION

In 2013, arable land covered 54% of total land area, permanent crops, comprising orchards and vineyards, accounted for 9%, while pastures covered 10% of the land area. The National Agricultural Census of 2011 identified 247 thousand ha of unused agricultural land, representing 7% of total land area. This illustrates the process of many owners abandoning land, but also the imperfection of legal framework allowing for such actions, as well as the lack of effective incentive mechanism to create alternative options to process the land. On some of the abandoned land natural reforestation takes place, however, it is mainly for the state-owned forestry companies or local municipal areas, while the private sector is not much involved.

Figure 1: Land use, as of January 1, 2013

	Thousand ha	Structure, %
Land – total, of which:	**3384,6**	**100**
1. Agricultural lands	2497,8	73,8
1.1. Arable lands	1814,1	53,6
1.2. Perennial plantations, of which:	295,3	8,7
1.2.1. Orchards	*135,1*	*4,0*
1.2.2. Vineyards	*147,3*	*4,2*
1.3. Pastures	348,9	10,3
1.4. Hayfields	2,1	0,1
1.5. Fallow land	37,4	1,1
2. Forests and lands with forest vegetation	464,2	13,7
3. Rivers, lakes, reservoirs	99,2	2,9
4. Other lands	323,4	9,6

Source: Statistical Yearbook of the Republic of Moldova, 2013

The negative consequences of intensive land use include erosion and landslides, conversion of steppe, soil salinization and drainage of wetlands or improper grazing management.

According to the UNECE[2], land degradation is a significant threat to the country's land resources. About 2 million ha of agricultural lands are situated on slopes with a variety of degrees of inclination, making them vulnerable to degradation. "Moldsilva" Agency, the public administrative body of forestry and hunting, estimates that 877,000 ha (35% of the agricultural land area) is subject to erosion. About 4.6% of the agricultural area was seriously eroded. Land erosion is advancing by an average of around 7,700 ha a year. Annual soil loss ranges from 5-10 t/ha on slightly eroded land to over 30 t/ha on highly eroded soils. In addition, the continuous diminution of the soil's nutrient reserves by 150-180 kg/ha/year is disturbing the nitrogen, phosphorus and potassium balance of the soil.

According to the same UNECE report, soil degradation is estimated to cause US$239 million in economic damage each year, including losses from erosion, landslides and in ravines, and agricultural production losses. Subsistence farming households, which cannot afford to address the problem, are particularly affected by erosion and soil fertility losses.

The main causes of land degradation in the Republic of Moldova are:

- Limited access to information on efficient land use;
- Land allocation among crops to be sawn by farmers taking insufficient account of the need for soil conservation;

[2] United Nations Economic Commission for Europe, Republic of Moldova. Third Environmental Performance Review, 2014

- Use of poor cultivation technologies / Insufficient crop rotation / Increased cultivation of row crops;
- Lack of financial resources to implement mitigation measures;
- Lack of adequate forest buffer zones;
- Cutting of shelterbelts along fields;
- Overgrazing of poorly managed pasture lands.

1.2 WATER POLLUTION

The Republic of Moldova withdraws water for economic use from surface and underground sources. At present, the volume of water withdrawn from surface sources exceeds by 6 times the volume from underground sources (mainly contained in confined aquifers)[3].

There are two major river basins in the Republic of Moldova: the Dniester (the largest) and Prut (the second largest) river basins. Their stream flow amounts to 98% of total surface water resources in Moldova. In addition to these two major rivers, there are numerous smaller rivers out of which only nine have a length of about or exceeding 100 km. Internal surface water resources account for 1.2 km^3/year. The entire river network consists of about 3,600 water streams totalling about 16,000 km in length.

Ground waters for centralized household and industrial use are withdrawn from ten aquifer complexes. The main ground water reserves are located in the deep confined aquifers of Middle Miocene deposits. They, especially the Lower Badenian-Sarmatian aquifer, a regional aquifer that underlies the entire country, are a major ground water source. There are approximately 7,000 boreholes for ground water withdrawal; their total debit (annual groundwater resources) accounts for approximately 1.3 km^3, including 0.7 km^3 of drinking water.

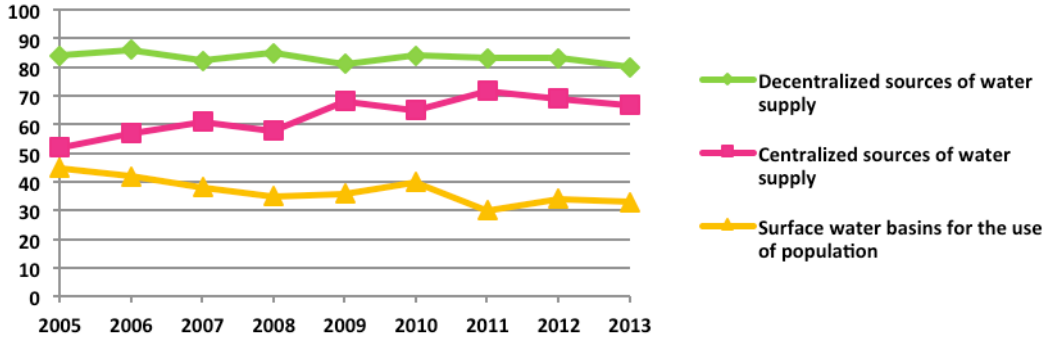
Irrigation of agricultural land uses around 50 mln. m^3 of water, almost exclusively from surface sources. It is estimated that central irrigation systems (mainly sourcing water from Dniester and Prut rivers) are installed on an area of 145 thousand ha, but a big share of this area isn't actually irrigated because of the poor management of the systems coupled with the poor cooperation among growers – the potential users of the systems. The irrigation from internal water streams is severely constrained by the inadequate quality of the water for irrigation purposes.

Due to on-going irrigation sector reform, an increase in water demand for irrigation can be expected. Agriculture is one of the main surface and groundwater users and polluters because of agrochemicals and poor nutrient management practices, which contribute to the eutrophication of water bodies. Agriculture is the main source of nitrous oxide discharges, caused by the application of nitric fertilizer and the associated soil fertility management. Furthermore, poor land and manure management practices contribute to the pollution of water.

The pollution of water from agricultural activities, in addition to lack of sustainable water management to protect the resources from pollution from untreated or insufficiently treated wastewater, and industrial activities leads to poor quality of water resources. Indeed, drinking water quality is constantly deteriorating. The percentage of samples not meeting sanitary standards grew from 52% in 2005 to 67% in 2013 in the case of water taken from the centralized sources of water supply. The sanitary situation of the decentralized water sources has stayed at the disappointing level of 80% of the samples failing to meet standards.

[3] 2009/2010 National Human Development Report, "Climate Change in Moldova: Socio-Economic Impact and Policy Options for Adaptation" (http://www.undp.md/publications/NHDRs.shtml)

Figure 2: The percentage of samples with deviations from sanitary norms



Source: National Scientific and Practical Centre of Preventive Medicine & Statistical Yearbook of the Republic of Moldova, 2013

1.3 RISKS FROM POOR FERTILIZER AND PESTICIDE MANAGEMENT

The use of mineral fertilizers increased from 16.5 thousand tons in 2005 to 34.7 thousand tons in 2012, while the use of organic fertilizers dropped six-fold between 2005 and 2006 and then recovered slightly to 20 thousand tons in 2012. The average amount applied per hectare of sown area is negligible: 44 kg. Nitrogen fertilizers are prevalent. Their consumption increased from 15 kg/ha in 2005 to 27 kg/ha in 2012. The use of phosphatic and potash fertilizers has also increased: phosphatic from 1.3 kg/ha in 2005 to 5.6 kg/ha in 2012, and potash from 0.4 kg/ha in 2005 to 2.2 kg/ha in 2012.

Table 1: Mineral and organic fertilizers used in agricultural enterprises

	2005	2006	2007	2008	2009	2010	2011	2012
Mineral fertilizers (active substance) – total, thou. tonnes	16.5	15.4	20.1	22.7	17.0	20.1	23.6	34.7
of which:								
nitrogen	14.8	12.8	17.1	19.9	14.6	16.4	19.2	26.9
phosphatic	1.3	1.9	2.0	1.7	1.6	2.4	2.9	5.6
potash	0.4	0.7	1.0	1.1	0.8	1.3	1.5	2.2
Total area where mineral fertilizers were applied (thousand ha)	286.7	255.9	350.1	402.6	301.5	324.0	412.7	n/d
In average per 1 sown hectare, kg	*21*	*20*	*25*	*28*	*21*	*24*	*29*	*44*
Total area where mineral fertilizers were applied as a percentage of total agricultural lands	*32*	*30*	*40*	*45*	*34*	*37*	*47*	*n/d*
Organic fertilizers, thou. tonnes	38.7	6.3	7.9	8.0	6.9	15.1	29.2	20.0
Total area where organic fertilizers were applied (thousand ha)	2.7	1.4	2.5	1.6	0.5	2.3	3.3	n/d
In average per 1 sown hectare, tonnes	*0.04*	*0.01*	*0.01*	*0.01*	*0.01*	*0.02*	*0.04*	*0.03*
Total area where organic fertilizers were applied as a percentage of total agricultural lands	*0.3*	*0.2*	*0.3*	*0.2*	*0.1*	*0.3*	*0.4*	*n/d*

Source: Statistical Yearbook of the Republic of Moldova, 2013 and United Nations Economic Commission for Europe, Republic of Moldova. Third Environmental Performance Review, 2014

The total area where mineral fertilizers were applied, as a percentage of total agricultural lands, has increased from 32% in 2005 to 47% in 2011. The total area where organic fertilizers were applied, as a percentage of total agricultural lands, is negligible: 0.4% in 2011. Today, approximately 30% of agricultural lands lack phosphorus, which seriously affects soil fertility.

During the last couple of years, the total annual use of phytosanitary products was around 2580 MT (total weight), or some 1.55 kg/ha. The total area where phytosanitary products were applied (excluding herbicides) was 566.3 thousand ha in 2012. Fungicides were applied on a larger territory than were insecticides. The area where herbicides were applied was 724.0 thousand ha in 2012.

Table 2: Use of phytosanitary products, thousand hectares

	2011	2012
Total area where phytosanitary products were applied (excluding herbicides), of which:	620	566
Insecticides	329	311
Fungicides	483	452
Biological control means	1	2
Total area where herbicides were applied, of which:	632	724
Before coming-up	225	233
After coming-up	407	491

Source: United Nations Economic Commission for Europe, Republic of Moldova. Third Environmental Performance Review, 2014

As mentioned above, agriculture is one of the main surface and groundwater polluters because of agrochemicals and poor nutrient management practices. Most farmers apply fertilizers without proper soil and plant tissue tests, so the risks of over- or under-fertilization are very high. The predominant opinion among farmers is that the country lacks a laboratory able to perform the entire spectrum of plant tissue analysis with high-confidence results. Most farmers lack basic knowledge of the life cycle of major pests of their crops, and there is an over-reliance of pesticides, leading inevitably to their excessive use. Biological control strategies are rather an abnormality than a rule in the Moldovan agriculture.

As of January 1, 2013, the national register of authorized phytosanitary products included 740 products with 315 active ingredients (copper and sulphur compounds, carbamates and thiocarbamates, organophosphorus compounds, chlorophenol, synthetic pyrethroids, neonicotinoids, sulfonylurea derivatives, strobilurins, etc.). It is also to be mentioned, that due to complicated registration procedures, the new modern phytosanitary products are slowly introduced into agricultural practice and many old products (some of them already prohibited in EU and other developed countries) are still officially accessible.

The Interdepartmental Republican Council is responsible for approval of the phytosanitary products and their periodic review based on newly available information, including reports from European Food Safety Authority. Despite the strategic decision to align the regulations with those of the European Union, currently the Register authorises several uses of phytosanitary products that are not authorized in the European Union because of unacceptably high risk for humans and environment (for example, the use of dimethoate on apples).

1.4 POLLUTION FROM AGRICULTURAL WASTE

As an agricultural country, the Republic of Moldova has high volumes of agricultural waste. The waste management issue is of particular importance for livestock production and for the food & drink industry.

Generation of waste by livestock production is a major environmental concern because most of the animal husbandry activities are done by households in villages, where most of the cattle are kept near the house and all the soluble manure goes into the soil, underground, etc. The World Bank Agricultural Pollution Control Project and GEF/UNDP Living Water Exchange projects have piloted with relative

success the concept of centralized manure composting facilities. Unfortunately, this experience wasn't taken up by other communities because of lack of technical knowledge and community organizational skills.

The generation and reuse of agricultural waste increased in the last couple of years, while disposal rates are relatively stable. This also indicates slight improvement, but without changes to the approach to waste management practice. The increase in reuse and recycling of agricultural waste was caused by improved management and also by using waste from wine and crop production for production of pellets and briquettes.

Table 3: Generation and use of waste in enterprises and organizations in 2013, thousand tons

	Existing at 01/01/13	Generated	Inputs	Used	Supplied	Destroyed or transported to dumps	Existing at 31/12/13
Waste - total	8,517.3	2,511.7	951.3	584.6	692.9	1,993.3	8,709.5
Waste of livestock production	187.7	494.4	22.9	183.5	43.2	160.6	317.6
Waste of food & beverage industry	55.2	379.9	1.9	62.1	134.0	177.6	63.4
Waste of plant growing sector	2.6	33.5	2.0	19.4	4.6	11.1	2.9

Source: National Bureau of Statistics of the Republic of Moldova (http://statbank.statistica.md)

1.5 LOSS OF BIODIVERSITY

Only about 2% of the country's grassland ecosystem is covered by natural or semi-natural habitats. This low percentage is additionally fragmented; intensive agriculture has pushed the ecological integrity of steppe habitat to its limits. Currently, natural steppe communities have been preserved only in small and isolated areas; five protected areas preserving steppe vegetation exist (in Bugeac, Dezgingea, Vranesti, Andriasevca and Ciumai-Vinogradovca), with a total area of 148 ha. This figure is too low to protect the gene pool of steppe plant communities in the Republic of Moldova. Even the basic steppe plant species have become rare. Of about 500 steppe and rock-steppe plant species, approximately 140 species are rare; 40 species were included into the 2001 edition of the Red List of the Republic of Moldova. The biodiversity of the steppe has been particularly altered and affected due to intensive grazing, soil erosion and salinization, and intensive use of fertilizers.

During last 10 years, wetlands have received significant attention, reflecting the economic and ecological importance of the ecosystem. The designation of three wetlands of international significance – Ramsar sites (Lower Prut Lakes of 19,152 ha, Lower Dniester of 60,000 ha and Unguri-Holosnita of 15,553 ha[4]) – offers the chance for increased species and habitat conservation measures. Nevertheless, the active restoration of riparian forest and wetland remains one of the major ecological tasks with on-the-ground implementation only starting recently and still being mainly project driven. Excessive agriculture and pasturing practices still lead to strong degradation and plant and animal species' shift and disappearance.

Continuous degradation of hedges between agricultural fields hampers the migration of specific animal species.

[4] 2006 amendment to the Law Nr. 1538 of 25.02.1998 regarding the natural areas protected by the State

2 Greening the Moldovan Agriculture through the Ecosystem Approach

The problems discussed above not exclusive to Moldova; unfortunately they are typical for all farming systems, in which most aspects of production are controlled by technological interventions such as soil tilling, protective or curative pest and weed control with agrochemicals, and the application of mineral fertilizers for plant nutrition.

The international experience suggests that the production systems that take a predominantly ecosystem approach are both productive and more sustainable[5]. These agro-ecological systems are generally characterized by minimal disturbance of the natural environment, plant nutrition from organic and non-organic sources, and the use of both natural and managed biodiversity to produce food, raw materials and other ecosystem services.

These farming systems will be based on three ***technical principles***:

- simultaneous achievement of increased agricultural productivity and enhancement of natural capital and ecosystem services;
- higher rates of efficiency in the use of key inputs, including water, nutrients, pesticides, energy, land and labour;
- use of managed and natural biodiversity to build system resilience to abiotic, biotic and economic stresses.

The farming practices required to implement those principles will differ according to local conditions and needs. However, in all cases they will need to:

- minimize soil disturbance by minimizing mechanical tillage in order to maintain soil organic matter, soil structure and overall soil health;
- enhance and maintain a protective organic cover on the soil surface, using crops, cover crops or crop residues, in order to protect the soil surface, conserve water and nutrients, promote soil biological activity and contribute to integrated weed and pest management;
- cultivate a wider range of plant species – both annuals and perennials – in associations, sequences and rotations that can include trees, shrubs, pastures and crops, in order to enhance crop nutrition and improve system resilience.

Those three key practices are generally associated with conservation agriculture (CA), which has been widely adopted in both developed and developing regions. Conservation agriculture is now practised on about 155 million ha worldwide, or about 11% of total crop land[6]. Highest adoption levels are found in Argentina (69%), Paraguay (54%), Brazil (43%), Australia (36%), Canada (36%), and USA (23%). Adoption is increasing in Eastern Europe, Africa, Central Asia and China.

However, in order to achieve its objectives, the farming systems need to be supported by four additional ***management practices***:

- the use of ***well adapted, high-yielding varieties*** with resistance to biotic and abiotic stresses and improved nutritional quality;

[5] This chapter draws heavily from the ecosystem approach designed by FAO and published in its "Save and Grow" Policymaker's Guide available at http://www.fao.org/ag/save-and-grow/index_en.html

[6] FAO AQUASTAT database, http://www.fao.org/nr/water/aquastat/data/query/index.html?lang=en

- ***enhanced crop nutrition*** based on healthy soils, through crop rotations and judicious use of organic and inorganic fertilizer;
- ***integrated management of pests, diseases and weeds*** using appropriate practices, biodiversity and selective, low risk pesticides when needed;
- ***efficient water management***, by obtaining "more crops from fewer drops" while maintaining soil health and minimizing off-farm externalities.

2.1 SOIL HEALTH

Agriculture must, literally, return to its roots by rediscovering the importance of healthy soil, drawing on natural sources of plant nutrition, and using mineral fertilizer wisely.

Soil is fundamental to crop production. Without soil, no food could be produced on a large scale, nor would livestock be fed. Because it is finite and fragile, soil is a precious resource that requires special care from its users. Many of today's soil and crop management systems are unsustainable. At one extreme, overuse of fertilizer leads to nitrogen deposition that threatens the sustainability of nature (including soil and water acidification, contamination of surface and groundwater resources, and increased emissions of potent greenhouse gases) and the health of people – see the case of the Soviet Moldova. At the other extreme, especially in the case of most Moldovan small farmers, the underuse of fertilizer means that soil nutrients exported with crops are not being replenished, leading to soil degradation and declining yields.

A shortage of any one of the 16 nutrients[7] required for plant growth can limit crop yield. To achieve the higher productivity needed to meet current and future food demand, it is imperative to ensure their availability in soils and to apply a balanced amount of nutrients from organic sources and from mineral fertilizers, if required. The timely provision of micronutrients in "fortified" fertilizers is a potential source of enhanced crop nutrition where deficiencies occur. Nitrogen can also be added to soil by integrating N-fixing legumes and trees into cropping systems. Because they have deep roots, trees and some soil-improving legumes have the capacity to pump up from the subsoil nutrients that would otherwise never reach crops. Crop nutrition can be enhanced by other biological associations – for example, between crop roots and soil mycorrhizae.

The way forward

The following actions are required to improve current land husbandry practices and provide a sound basis for the successful adoption of sustainable farming in Moldova:

- Monitor soil health based on objective data. An important step would be the update of the agricultural soil maps, as planned by the National Programme for Conservation and Improvement of Soil Fertility for 2011–2020, using internationally-harmonized land quality indicators;
- Maintain and further develop the network of conservation agriculture demonstration plots established by IFAD V project;

[7] Three essential nutrients - carbon, hydrogen and oxygen - are taken up from atmospheric carbon dioxide and water. The other 13 nutrients are taken up from the soil and are usually grouped as primary nutrients (nitrogen, phosphorus and potassium), secondary nutrients (calcium, magnesium and sulphur) and micronutrients (iron, manganese, zinc, copper, boron and molybdenum).
Source: NCAGR, Essential Plant Nutrients, http://www.ncagr.gov/agronomi/pdffiles/essnutr.pdf

- Build capacity. Soil health management is knowledge-intensive and its wide adoption will require capacity building through training programmes for the national extension network and various rural development consulting service providers, and farmers. The skills of researchers will also need to be upgraded, in order to provide the enhanced knowledge to the extension/consulting specialists and farmers;
- Disseminate information and communicate benefits. Any large-scale implementation of soil health management requires that supporting information is made widely available, particularly through channels familiar to farmers and extension workers. As Internet becomes a mainstream communication channel, the availability of the updated soil maps through the Geospatial Data Fund (www.geoportal.md) is a priority;
- Review national regulations for sound land husbandry (such as Government Decision Nr. 1157 of 13.10.2008 approving the Technical Regulation "Soil protection measures for agricultural practices" and Government Decision Nr. 667 of 23.07.2010 approving the Regulation on Grazing and Haymaking) in order to better define the requirements and responsibilities for their enforcement;
- Review the criteria of the Agricultural Subsidy Fund in order to stimulate farmers using environmentally friendly land husbandry and complicate the access to the Fund's resources for the farmers that use practices that cause soil degradation or pose serious threats to the environment, based on the criteria of the relevant national regulations.

2.2 CROPS AND VARIETIES

Farmers need a genetically diverse portfolio of improved crop varieties, suited to a range of agro-ecosystems and farming practices, and resilient to climate change.

Sustainable farming systems need crops and varieties that are better adapted to ecologically based production practices than those currently available, which were bred for high-input agriculture. The targeted use of external inputs will require plants that are more productive, use nutrients and water more efficiently, have greater resistance to insect pests and diseases, and are more tolerant to drought, flood, frost and higher temperatures. The varieties will need to be adapted to less favoured areas and production systems, produce food with higher nutritional value and desirable organoleptic properties, and help improve the provision of ecosystem services.

The system that will provide high-yielding and adapted varieties to farmers has three parts: conservation and distribution of plant genetic resources (PGR), variety development and seed production and delivery. The stronger the links among these different parts, the better the whole system will function.

Today genebanks around the world conserve some 7.4 million accessions, including 6.6 million accessions conserved in national genebanks[8]. In Moldova, there are several State-owned institutions and organizations that perform in-situ and ex-situ conservation of traditional and modern varieties and crop wild relatives for a series of crops. Unfortunately, several of these conservation sites are underfunded. The situation could be improved during the implementation of the Biodiversity Strategy and Action Plan for 2014-2020 years recently developed under the leadership of the Ministry of

[8] FAO, The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture (http://www.fao.org/docrep/013/i1500e/i1500e_brief.pdf)

Environment (at the moment of the development of this study, the strategy was not yet approved by the Government).

Most of variety development in Moldova is in the public sector, and suffers from underfunding, frequently coupled with a disconnection between breeders and farmers. Globally there is a trend of increased importance of private breeding programs. For most crops Moldova represent a market too small for international breeders to invest in official registration of varieties in Moldova. Thus the rigid variety release legislation in Moldova acts as a barrier for farmers' access to improved crop varieties. Moldova has a weak (or inexistent) post-registration variety monitoring system, so farmers need to establish informal channels to obtain information about long-term performance of a given variety.

In Moldova the State-controlled seed production and delivery programs frequently suffer from underinvestment, thus they have problems competing with higher quality seeds offered by international companies. It is telling that the relatively big corn seed program of the "Porumbeni" Institute recently upgraded their seed calibration and packing equipment from a FAO grant, and not from their own resources. Several of these programs are strongly integrated in the structure of the research institutes, and possibly would be better managed if they would be spun off in separate companies.

The way forward

Actions in the technical, policy and institutional arenas can help ensure that plant genetic resources and seed delivery systems function effectively to support sustainable farming systems in Moldova. Although they will involve diverse institutions and take place at various scales, the required actions will have their greatest impact if they are coordinated. Recommended measures include:

- Review the variety conservation programs operating in Moldova, identify those with greatest potential and develop clear strategies for their operations (including interaction with national and regional breeding programs) and funding;
- In strong cooperation of research institutes with farmer associations, establish a low-cost system for post-registration variety testing;
- Review the variety release legislation and identify mechanisms acceptable for all stakeholders to increase the access of farmers to the foreign-bred varieties, with focus on the mostly-affected sectors: perennial crops and organic farming;
- Perform a strategic analysis of the existing State-owned/controlled seed production and delivery programs. Develop business plans, determine the opportunity of a spin-off from the research institute and upgrade their production infrastructure in order to enable consistent delivery of high quality seeds. Upgrade the strategic marketing and management skills of the managers leading these programs.

2.3 WATER MANAGEMENT

Sustainable intensification requires smarter, precision technologies for irrigation, and farming practices that use ecosystem approaches to conserve water.

Crops are grown under a range of water management regimes, from simple soil tillage aimed at increasing the infiltration of rainfall, to sophisticated irrigation technologies and management. Growing pressure from competing demands for water, along with environmental imperatives, mean that agriculture must obtain "more crops from fewer drops" and with less environmental impact. That is a significant challenge, and implies that water management will need to anticipate smarter, precision

agriculture. It will also require water management in agriculture to become much more adept at accounting for its water use in economic, social and environmental terms.

Under rainfed conditions, water management attempts to control the amount of water available to a crop through the opportunistic deviation of the rainwater pathway towards enhanced moisture storage in the root zone. However, the timing of the water application is still dictated by rainfall patterns, not by the farmer. Many crop varieties grown in rainfed systems are adapted to exploit moisture stored in the root zone. Rainfed systems can be further improved by, for example, using deep-rooting crops in rotation, adapting crops to develop a deeper rooting habit, increasing soil water storage capacity, improving water infiltration and minimizing evaporation through organic mulching. Capture of runoff from adjacent lands can also lengthen the duration of soil moisture availability. Improving the productivity of rainfed agriculture depends largely on improving husbandry across all aspects of crop management. Factors such as pests and limited availability of soil nutrients can limit yield more than water availability per se. The principles of reduced tillage, organic mulching and use of natural and managed biodiversity are fundamental to improved husbandry.

By controlling both the amount and timing of water applied to crops, irrigation facilitates the concentration of inputs to boost land productivity. Farmers apply water to crops to stabilize and raise yields. Globally, irrigated yields are two to three times greater than rainfed yields. Thus, a reliable and flexible supply of water is vital for high value, high-input cropping systems. However, the economic risk is also much greater than under lower input rainfed cropping. Irrigation can also produce negative consequences for the environment, including soil salinization and nitrate contamination of aquifers.

Irrigation is a commonly used platform for intensification because it offers a point at which to concentrate inputs. Making this sustainable, however, depends on the location of water withdrawal and the adoption of ecosystem based approaches – such as soil conservation, use of improved varieties and integrated pest management. The uniformity of distribution and the application efficiency of irrigation vary with the technology used to deliver water, the soil type and slope (most importantly its infiltration characteristic), and the quality of management.

Surface irrigation by border strip, basin or furrow is often less efficient and less uniform than overhead irrigation (e.g. sprinkler, drip, drip tape). Micro irrigation has been seen as a technological fix for the poor performance of field irrigation, and as a means of saving water. It is being adopted increasingly by the Moldovan horticulturalists, despite high capital costs.

Deficit irrigation and variants such as regulated deficit irrigation (RDI) are gaining hold in the global commercial production of fruit trees and some field crops that respond positively to controlled water stress at critical growth stages. RDI is often practised in conjunction with micro-irrigation and "fertigation", in which fertilizers are applied directly to the region where most of the plant's roots develop.

Knowledge-based precision irrigation that offers farmers reliable and flexible water application will be a major platform for the sustainable farming systems. Automated systems have been tested using both solid set sprinklers and micro-irrigation, which involve using soil moisture sensing and crop canopy temperature to define the irrigation depths to be applied in different parts of the field. Precision irrigation and precision fertilizer application through irrigation water are both future possibilities for field crops and horticulture, but there are potential pitfalls. Recent computer simulations indicate that, in horticulture, salt management is a critical factor in sustainability.

In the future, fertigation technology (including use of liquid fertilizers), deficit irrigation and wastewater-reuse will be better integrated within irrigation systems. While the introduction of a new technology into irrigated cropping systems has high entry costs and requires institutional arrangements

for operation and maintenance, the use of precision irrigation is now global. Farmers in developing countries are already adopting low-head drip kits for niche markets, such as horticulture. In addition, the availability of cheap, plastic moulded products and plastic sheeting for plasticulture is likely to expand.

The service delivery of many public irrigation systems is less than optimal, owing to deficiencies in design, maintenance, management, and tariff structure. There is considerable scope for modernizing systems and their management. As part of the Compact with the Millennium Challenge Corporation, Moldova is currently upgrading up to 11 Central Irrigation Systems that cover 15 thousand hectares of farmland. In accordance with the best practices, the management of these systems were transferred from the government to the Water User Associations[9].

The way forward

Water management in the Moldovan agriculture will need to cope with less water per hectare of land and will also have to internalize the cost of pollution from agricultural land. Policy incentives that focus on the most pressing environmental externalities, while leveraging individual farmer's profit motives, have a greater chance of success.

The following actions are required to improve current water management practices and provide a sound basis for the successful adoption of sustainable farming in Moldova:

- Increased applicative research on deficit and precision irrigation technologies and practices;
- Build capacity. Water management is knowledge-intensive and its wide adoption will require capacity building through training programmes for ACSA extension workers and farmers. Beside technical and technological issues, the training programs should include the topics related to the functioning of water user associations;
- Review the best practices and lessons learnt from the rehabilitation of the central irrigation systems included in the Compact Program and develop a national program to apply them to all central irrigation systems operating in the country, including management transfer to water user associations and full water cost recovery mechanisms;
- Carry out the institutional reform – separation of irrigation activities from "Apele Moldovei" Agency to a new entity under MAFI (as planned in the National Agriculture and Rural Development Strategy 2014-2020) – based on the lessons learnt during the Compact Program activities;
- Develop new mechanisms for the financing of rehabilitation of central irrigation systems, including public-private partnerships;
- Review the basis for the calculation of the "Support for irrigation of agricultural land" subsidy in order to stimulate the farmers adopting energy-saving practices. A special attention and an increased subsidy support may be given to irrigation technologies with water use control and saving parameters.

2.4 PLANT PROTECTION

Pesticides kill pests, but also pests' natural enemies and their overuse can harm farmers, consumers and the environment. The first line of defence is a healthy agro-ecosystem.

[9] For details, see Irrigation Sector Reform Activity of the Compact, www.irigare.md

Plant pests are often regarded as an external, introduced factor in crop production. That is a misperception, as in most cases pest species occur naturally within the agro-ecosystem. Pests and accompanying species – such as predators, parasites, pollinators, competitors and decomposers – are components of crop-associated agro-biodiversity that perform a wide range of ecosystem functions. Pest upsurges or outbreaks usually occur following the breakdown of natural processes of pest regulation.

Although populations of potential pests are present in every crop field, every day, regular practices, such as crop monitoring and spot control measures, usually keep them in check. In fact, the total eradication of an insect pest would reduce the food supply of the pest's natural enemies, undermining a key element in system resilience. The aim, therefore, should be to manage insect pest populations to the point where natural predation operates in a balanced way and crop losses to pests are kept to an acceptable minimum.

When that approach does not seem sufficient, farmers often respond by seeking additional protection for their crops against perceived threats. The pest management decisions taken by each farmer are based on his or her individual objectives and experiences. While some may apply labour-intensive control measures, the majority turn to pesticides. As a control tactic, over-reliance on pesticides impairs the natural crop ecosystem balance. It disrupts parasitoid and predator populations, thereby causing outbreaks of secondary pests. It also contributes to a vicious cycle of resistance in pests, which leads to further investment in pesticide development but little change in crop losses to pests.

Excessive use of pesticide also exposes farmers to serious health risks and has negative consequences for the environment, and sometimes for crop yields. Often less than 1% of pesticides applied actually reaches a target pest organism; the rest contaminates the air, soil and water.

Consumers have grown increasingly concerned about pesticide residues in food. The serious consequences of pesticide-related occupational exposure have been amply documented. Public concerns are being translated into more rigorous standards both domestically and in international trade. Major retailers and supermarket chains have endorsed stricter worker welfare, food safety, traceability and environmental requirements (documented in standards such as GlobalGAP). However, weak regulation and management of pesticides continue to undermine efforts to broaden and sustain ecologically-based pest management strategies. That is because pesticides are aggressively marketed and, therefore, often seen as the cheapest and quickest option for pest control.

Farmers would benefit from a better understanding of the functioning and dynamics of ecosystems, and the role of pests as an integral part of agro-biodiversity. Over the past 50 years, integrated pest management (IPM) has become and remains the world's leading holistic strategy for plant protection. From its first appearance in the 1960s, IPM has been based on ecology, the concept of ecosystems and the goal of sustaining ecosystem functions. IPM is founded on the idea that the first and most fundamental line of defence against pests and diseases in agriculture is a healthy agro-ecosystem, in which the biological processes that underpin production are protected, encouraged and enhanced. Enhancing those processes can increase yields and sustainability, while reducing input costs. In intensified systems, environmental factors of production affect the prospects for the effective management of pests:

- *Soil management* that applies an ecosystem approach, such as mulching, can provide refuges for natural enemies of pests. Building soil organic matter provides alternate food sources for generalist natural enemies and antagonists of plant disease and increases pest-regulating populations early in the cropping cycle.
- *Water stress* can increase the susceptibility of crops to disease.

- *Crop varietal resistance* is essential for managing plant diseases and many insect pests. Vulnerability can arise if the genetic base of host plant resistance is too narrow.
- *Timing and spatial arrangement of crops* influence the dynamics of pest and natural enemy populations, as well as levels of pollination services for pollinator-dependent horticultural crops. As with other beneficial insects, reducing pesticide applications and increasing diversity within farms can increase the level of pollination service.

As an ecosystem-based strategy, IPM has achieved some notable successes in world agriculture. Today, large-scale government IPM programmes are operational in more than 60 countries, including Brazil, China, India and most developed countries. There is general scientific consensus – underscored by the recent International Assessment of Agricultural Science and Technology for Development[10] – that IPM works and provides the basis for protecting SCPI. The following are general principles for using integrated pest management in the design of programmes for sustainable intensification.

- *Use an ecosystem approach* to anticipate potential pest problems. The production system should use, for example, a diverse range of pest-resistant crop varieties, crop rotations, intercropping, optimized planting time and weed management. To reduce losses, control strategies should take advantage of beneficial species of pest predators, parasites and competitors, along with biopesticides and selective, low risk synthetic pesticides. Investment will be needed in strengthening farmers' knowledge and skills.
- *Undertake contingency planning* for when credible evidence of a significant pest threat emerges. That will require investment in seed systems to support deployment of resistant varieties, and crop-free periods to prevent the carryover of pest populations to the following season. Selective pesticides with adequate regulatory supervision will need to be identified, and specific communication campaigns prepared.
- *Analyse the nature of the cause of pest outbreaks* when problems occur, and develop strategies accordingly. Problems may be caused by a combination of factors. Where the origin lies in intensification practices – for example, inappropriate plant density or ploughing that disperses weed seeds – the practices will need to be modified. In the case of invasions by pests such as locusts, methods of biological control or disease suppression used in the place of origin can be useful.
- *Determine how much production is at risk*, in order to establish the appropriate scale of pest control campaigns or activities. Risks from pests are often over-estimated, and crops can to some extent compensate physiologically for pest damage. The response should not be disproportionate.
- *Undertake surveillance to track pest patterns* in real time, and adjust response. Georeferenced systems for plant pest surveillance use data from fixed plots, along with roving survey data and mapping and analysis tools.

The way forward

The "business as usual" approach to pest management, still followed in many countries and by many farmers, limits their potential for implementing sustainable farming systems. Improvements in agro-ecosystem management can help avoid indigenous pest outbreaks, respond better to pest invasions and reduce risks from pesticides to both human health and the environment.

The success of effective pest management using IPM techniques depends ultimately on farmers; it is they who make key management decisions on the control of pests and diseases. Still, there is a scope for public interventions through such policy instruments as:

[10] http://www.unep.org/dewa/Assessments/Ecosystems/IAASTD/tabid/105853/Default.aspx

- Targeted research in areas such as host plant resistance to pests and diseases, practical monitoring and surveillance methods, innovative approaches to field pest management, the use of selective pesticides (including biopesticides) and biocontrol;
- Increased investments in the existing State-owned facilities/laboratories producing biopesticides; Assessment of their business model and potential spin-off, including attraction of private investments;
- Technical assistance and extension support to farmers in applying ecologically based management practices and developing and adapting technologies, taking into account their local knowledge, social learning networks and conditions. Develop IPM guides centred around the major crops (cropping systems);
- Establish under the National Food Safety Agency a network of automatic weather stations to provide timely, relevant and local weather data to assist growers, advisors and phytosanitary inspectors make more informed decisions. This could be based on the weather stations already installed by more than 70 growers throughout Moldova. The data processing and communication platform could be based on the solution currently under development by the Institute of Genetics, Physiology and Plant Protection[11] or an already developed international platform could be adopted (Fieldclimate by iMetos[12] or RIMpro by Bio Fruit Advies[13]);
- Review of policies governing official registration of pesticides, by introducing a stronger linkage with EU norms and regulations in order to exclude the pesticides (active substances) with particular serious harm to health and environment. In case the delisting of a pesticide exposes farmers to the risk of lack of control mechanisms, allow a clearly defined temporary pesticide registration, in order to stimulate the appearance of alternatives on the market.

Large-scale adoption of ecosystem approaches would provide opportunities for small local industries (for example, production of biopesticides). The scaling up of ecological pest management practices can be expected to increase demand for commercial monitoring tools, biocontrol agents such as predators, parasitoids or sterile organisms, pollination services, microorganisms and biopesticides.

[11] http://www.eco-con.net
[12] http://www.fieldclimate.com/index_new.php
[13] http://www.biofruitadvies.nl/rimpro/rimpro_e.htm

3 Organic Agriculture in Moldova

3.1 LEGAL FRAMEWORK FOR ORGANIC AGRICULTURE IN MOLDOVA

The first attempt of establishing a framework for development of organic agriculture in Moldova was the Government Decision No. 863 of 21.08.2000 regarding approval of the national concept of organic agriculture, production and marketing of organic and non-GMO food products.

The national legal framework in the field of organic agriculture has its roots in 2005, when the Law No. 115 of 09/06/2005 regarding organic food products was adopted. The Law specifies the basic principles and specific methods of organic agriculture, labelling rules for organic products (including provisions regarding the national organic farming logo "Agricultura Ecologică – Republica Moldova"), basic principles of the certification system for organic products, and specific rules for the import and export of organic products.

The Law 115/2005 was enabled by the Government Decision No. 149 of 10/02/2006 which contains detailed implementation rules through:

- Regulation regarding the methods and principles of organic agrifood products;
- Regulation regarding the inspection and certification system;
- Rules regarding the import and export of organic agrifood products.

The initial legal framework was based on the EU legislation, and namely Council Regulation (EEC) No. 2092/91 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs.

In order to achieve the compliance of the legal framework of the Moldovan organic agriculture with the revised national legislation on technical regulations, through its decision No. 1078 of 22.09.2008 the Moldovan Government adopted the Technical Regulation "Organic agrifood products and labelling of organic agrifood products", which makes reference to the Law 115/2005 and GD 149/2006 and adds some new rules as required by the national legislation on technical regulations. This was also an attempt to harmonize the Moldovan organic regulations to the new EU Council Regulation (EC) No 834/2007 on organic production and labelling of organic products that repealed Regulation (EEC) No 2092/91. A modification to the Law 115/2005 was adopted through the Law 26 of 24.02.2011 to harmonize the Moldovan legal framework with the new changes in EU regulations.

The inspection and certification bodies should obtain accreditation in the field of organic products from the National Accreditation Center of the Republic of Moldova based on SM SR EN ISO/CEI 17065:2013, a standard setting the requirements for bodies certifying products, processes and services (until May 2013 the organic inspection and certification bodies were accredited based on SM SR EN 45011:2003, equivalent to ISO/IEC Guide 65:1996 - General requirements for bodies operating product certification systems and SM SR EN ISO/CEI 17020:2006 - General criteria for the operation of various types of bodies performing inspection). After receiving accreditation, the inspection and certification bodies should apply for authorization from a specialized MAFI Commission established by the MAFI Order No. 9 of 19.01.2010. This order specifies the members of the Commission for authorization of inspection and certification bodies for organic agrifood products and approves the Regulation of the Commission's functioning.

Despite the strategic objective to harmonize its legislation with that of EU, the Moldovan legislation lags behind. For example, the detailed rules on organic wine introduced by EU through Commission Regulation (EC) No. 889/2008 and Regulation No 203/2012 weren't yet transposed in the Moldovan legislation.

Through its Association Agreement with EU (expected to be signed by mid-2014), the Republic of Moldova undertakes to gradually approximate its legislation to the following EU legislation within 4 years of the entry into force of the Agreement:

- Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91;
- Commission Regulation (EC) No 889/2008 of 5 September 2008 laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007 on organic production and labelling of organic products with regard to organic production, labelling and control;
- Commission Regulation (EC) No 1235/2008 of 8 December 2008 laying down detailed rules for implementation of Council Regulation (EC) No 834/2007 as regards the arrangements for imports of organic products from third countries.

At the same time, on 24 March 2014 the European Commission adopted the legislative proposals for a new Regulation on organic production and labelling of organic products, which could be adopted in their final version by 2016. To be able to keep the pace with the changes, the Moldovan legal framework has to be simplified by avoiding the duplication of several parts in Law 115/2005, GD 149/2006 and GD 1078/2008.

3.2 NATIONAL LABEL FOR ORGANIC PRODUCTS

In December 2010 the Government has launched the national organic farming logo "Organic Agriculture – Republic of Moldova". This is applied only on products, labels and packing of organic food products which have been inspected and certified by certification bodies along their production cycle. A Government Decision on the regulations for the use of the logo is currently in the approval process[14].

In this context it is worth to pay attention to the weaknesses of the design of the above mentioned logo, which contradict some good practices in developing logos[15]:

1. *Simplicity and Memorability*. The logo uses 4 colours and shades, plus two color gradients. The word "Eco" is pictured as a distinctive element; however it is framed by another distinctive element (stylized leaf). The above mentioned gaps have a negative impact on logo's memorability.
2. *Versatility*. As the logo is too complicated in design is also not very versatile, as too many colors and color gradients make more difficult its reproduction in a consistent and precise way on different media, if not impossible[16]. More difficult its reproduction also means bigger costs to manufacture the package bearing this logo.

   Also it is considered that a good logo will keep the message even printed in black&white.

[14] http://www.maia.gov.md/doc.php?l=ro&idc=49&id=16143

[15] http://www.smashingmagazine.com/2009/08/26/vital-tips-for-effective-logo-design/ http://www.design-stuff-online.com/articles/what-makes-a-good-logo.php

[16] Color gradients can't be reproduced when using some technologies e.g. screen or stencil printing.

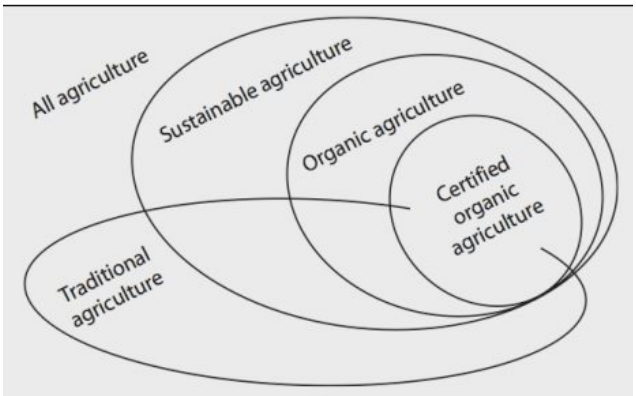
3. *Clear text*. As the wordings "Agricultura ecologică" and "Republica Moldova" are written on a pattern and on curve it is less readable. From another side there is an overlapping of meaning with the text "Eco".
4. *Appropriateness*. This logo is supposed to be placed on food products, thus it has to be eye appealing. It is known that buyers "taste" the food by eye first.

As the current national organic logo isn't yet well known to the public, it is advisable for the Moldovan authorities to review it in line with best practices. The "User manual of the EU organic farming logo"[17] includes several examples of use cases of the "Euroleaf" that are not possible for the current version of the Moldovan organic farming logo.

Moldova **European Union** **France** **Switzerland**

3.3 TRENDS IN THE NATIONAL ORGANIC SYSTEM

Many countries, including Moldova, have good statistics on certified organic agriculture, mainly due to various financial incentive schemes linked to certification. Still, the organic world is larger, and the effort to assess the exact size of the sector in Moldova is a challenge.



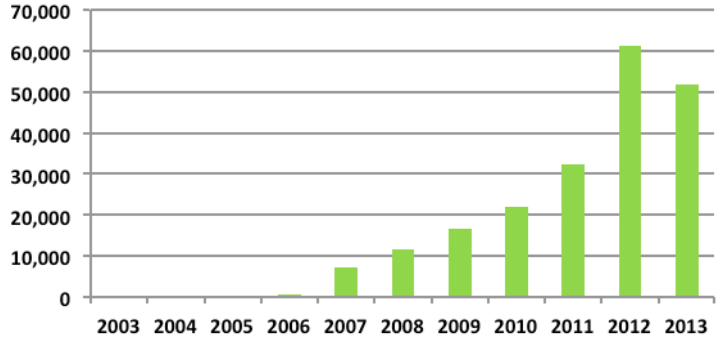
Thus, the official statistics in Moldova do not cover those producers that apply organic agriculture practices, but are not certified, or are certified by foreign organizations, outside of the National Organic Certification System.

3.3.1 Production

According to the official statistics organic agriculture has grown at a steady pace in recent years in Moldova. During 2003-2012, the area under organic crops (both certified and in conversion) went up from 80 ha to 61.280 ha, with a decline to 51.681 ha in 2013 (including 42.327 ha certified organic). In 2012 (the peak year), organic certified area made up to 1.7% of utilized agriculture land in Moldova.

[17] http://ec.europa.eu/agriculture/organic/documents/logo/user_manual_logo_en.pdf

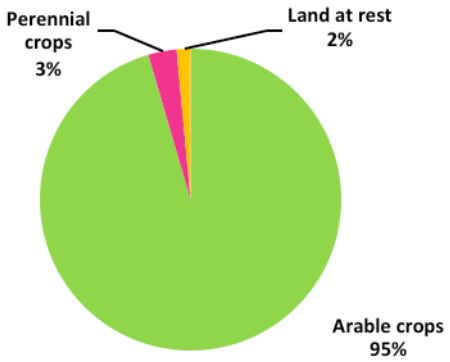
Figure 3: Agriculture area under organic crops (ha)



Source: MAFI, TAIEX Workshop on development of organic farming in Moldova - Adding value to agricultural production, 2014

Structurally, organic areas were mostly under arable crops (95%), while permanent crops occupy only 3%. For comparison, according to the data compiled by FiBL & IFOAM[18], in Europe the permanent crops have a much larger relative share - 19% of the organic cropland area.

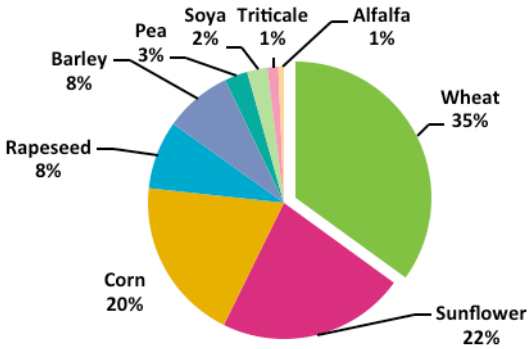
Figure 4: Structure of certified and in-conversion organic areas



Source: MAFI, TAIEX Workshop on development of organic farming in Moldova - Adding value to agricultural production, 2014

Wheat, sunflower and corn are the key arable crops under organic farming, occupying collectively 77%.

Figure 5: Structure by area of annual organic crops

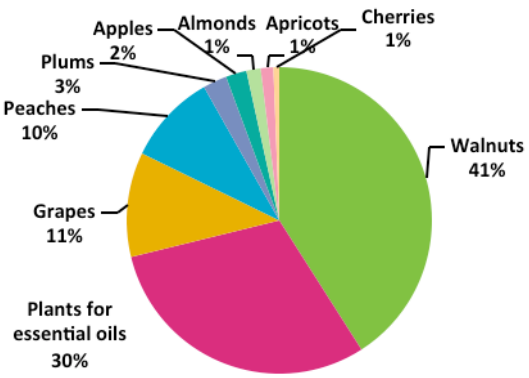


Source: MAFI, TAIEX Workshop on development of organic farming in Moldova - Adding value to agricultural production, 2014

[18] FiBL & IFOAM. The World of Organic Agriculture. Statistics and Emerging Trends, 2014 (https://www.fibl.org/en/shop-en/article/c/international-en/p/1636-organic-world-2014.html)

Walnuts, plants for the production of essential oils and grapes dominate organic perennial plantations (82%).

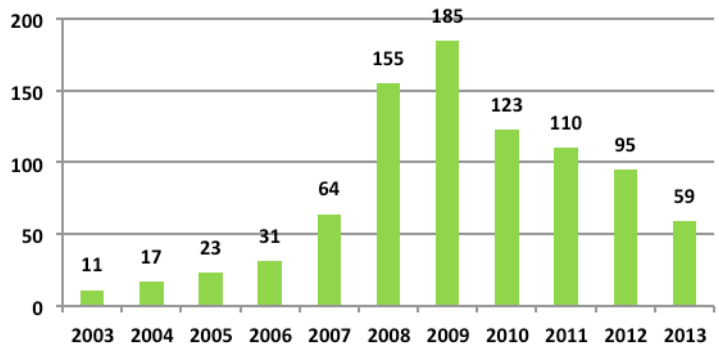
Figure 6: Structure by area of perennial organic crops



Source: MAFI, TAIEX Workshop on development of organic farming in Moldova - Adding value to agricultural production, 2014

The number of certified and in-conversion organic farmers has grown with 60% CAGR during the period 2003-2009, reaching the peak of 185. Since then, the number of farmers covered by the National Organic Certification System is in permanent decline, decreasing three-fold during the last 4 years. Currently there are 16 certified organic growers and another 43 are in conversion process.

Figure 7: Number of certified and in-conversion organic farmers



Source: MAFI, TAIEX Workshop on development of organic farming in Moldova - Adding value to agricultural production, 2014

The apparently contradicting trends – growth in area under organic farming and decline in the number of organic farmers – are explained by the abandonment of the organic farming by a significant number of smaller farmers and emerging of a few large companies producing arable crops for export markets, such as Agricereal SRL, Agrostoc Cooperative, Rostan SRL, Glia CAP and Proget Agro SRL.

3.3.2 Marketing

3.3.2.1 Local Market

It is difficult to discuss about a proper market of organic products in Moldova. There is only one shop – Casa Bio – specialized in trading with organic products, the most part of them being produced abroad. There are no specialized sections in Moldovan stores dedicated to organic products. However organic products can be seen occasionally in bigger supermarkets, targeting US or EU expatriates.

Because organic agriculture and organic products are not promoted properly, the general literacy in the field is quite low and the general public mixes things up when referring to the subject. In contrary to the Moldovan legislation, words such as “biological”, “bio”, “ecological”, “eco”, and “organic” are frequently

used in mass-media to describe products that are not certified-organic. Even the agricultural producers are part of this confusion. For example, the website of the Moldova Wine Guild includes a typical mistake/myth: "*The Moldovans can't afford pesticides and most of their vineyards are organic*".

Among the Moldovan consumers there is an increased concern for the quality and health attributes of their food, and this demand could be served by the certified-organic growers. However, because of no clear differentiation line in the mind of consumers, the organic products generally compete on the same base as the products resulted from conventional agriculture.

The harsh competition on retail markets associated with relatively low purchasing power of residents make retailers irresponsive to organic products potential which, regularly, are more expensive than conventional products.

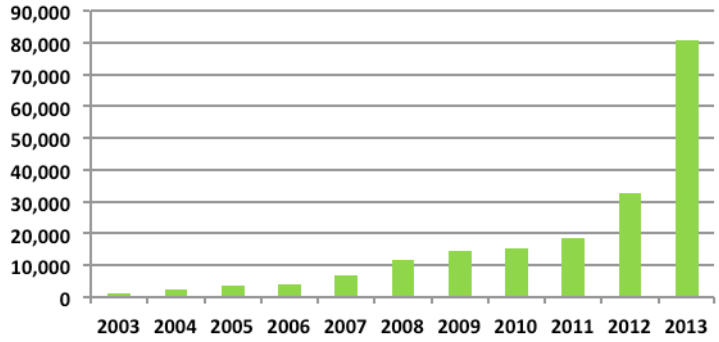
The *Register of economic entities involved in the organic agrifood sector* which is maintained by MAFI is not available online, and thus an opportunity to connect the organic farmers to the market is missed.

3.3.2.2 Exports

From another side exports of organic crops have generally grown steady. Significant increase was realized in 2012 and 2013 mostly due to a number of producers that started to export certified organic grains to the European Union.

In 2013 the exports of certified organic products were 45 thousand MT, and another 36 thousand MT were exported from in-conversion fields. Exports consist mostly of grains, oilseed and protean crops, essential oils, and sunflower oil. 80% of these exports are unprocessed crops.

Figure 8: Exported volumes of products from organic farming (MT)



Source: MAFI, TAIEX Workshop on development of organic farming in Moldova - Adding value to agricultural production, 2014
Note: Data includes products from both certified and in-conversion organic farming

According to the official statistics the main export markets are EU countries - Italy, Germany, Poland, Czech Republic and Slovakia. The total export value is estimated at 587 million MDL (=32 million EUR). The share of products from perennial crops in the value of exports is 18%, significantly higher than their share in the area structure (3%), because of much higher prices per unit of production.

Figure 9: Export of Moldovan organic products in 2013

Produce	Main export destination	Quantity, MT	Value, mln. MDL
Products from arable crops			
Sunflower oil	Poland	2.800	72.1
Feed grains	Italy	16.350	69.4
Soya beans	Italy	8.940	64.3
Sunflower seeds	Slovakia	9.500	59.3
Rapeseed	Germany	10.100	59.0

Produce	Main export destination	Quantity, MT	Value, mln. MDL
Feed peas	Czech Republic	8.650	58.8
Barley	Poland	10.350	37.8
Feed corn	Italy	7.600	29.6
Pumpkin seeds	Holland	500	13.2
Rye	Poland	2.340	9.5
Triticale	Czech Republic	2.100	8.0
Products from perennial crops			
Shelled walnuts	Germany	962	86.4
Dried plums	Germany	208	7.2
Dried apples	Germany	175	6.4
Dried rosehips	Switzerland	68	3.0
Dried cherries	Austria	44	2.4
Cherries, preventively preserved	Austria	130	1.1

Source: MAFI, TAIEX Workshop on development of organic farming in Moldova - Adding value to agricultural production, 2014
Note: Data includes products from both certified and in-conversion organic farming

3.4 MOLDOVAN ORGANIC FARMERS WITH INTERNATIONAL CERTIFICATIONS

A significant number of exported-oriented companies operating in organic farming are not covered by the National Organic Certification System because of particularities of the certification systems in the export markets they operate.

For example, EU recognizes the organic certification systems of only 11 countries, and the Republic of Moldova is not in this list. For the Moldovan organic growers wishing to export to EU there are two options:

1. *Control by EU-recognised inspection body or inspection authority*. From 1 July 2012, the EU Commission has established a list of control authorities and control bodies competent to carry out inspections in countries not included in the list of recognised third countries, as stated in Annex IV to Regulation (EC) No 1235/2008.
2. *Authorisations to importers on a case by case basis*. In order not to disrupt international trade, and to facilitate the transition toward the system of *EU-recognised inspection bodies or inspection authorities*, till July 1, 2014, the EU Member States were allowed to continue to grant import authorisations for consignments from third countries not inspected by the bodies from the above mentioned list. Importers had to prove that products were obtained according to production rules equivalent to those laid down by Community legislation and were subject to inspection measures.

Table 4: List of recognized certification bodies authorized by EU to operate in the Republic of Moldova

Certification body	Product categories		
	Unprocessed plant products	Live animals or unprocessed animal products	Processed agriproducts for use as food
Abcert AG	X		
Agreco R.F. Göderz GmbH	X		X
Austria Bio Garantie GmbH	X		
BCS Öko-Garantie GmbH	X		X
Bio.inspecta AG	X		X
CERES GmbH	X	X	X
Control Union Certifications	X		X
Ecocert SA	X		X
Istituto Certificazione Etica e Ambientale	X		X

Certification body	Product categories		
	Unprocessed plant products	Live animals or unprocessed animal products	Processed agriproducts for use as food
SGS Austria Controll-Co. GmbH	X		X

Source: Consolidated version of Commission Regulation (EC) No 1235/2008 of 8 December 2008 laying down detailed rules for implementation of Council Regulation (EC) No 834/2007 as regards the arrangements for imports of organic products from third countries

Out of this list, only the ICEA certification body from Italy is also recognized in the National Organic Certification System. There are no EU-recognized certification bodies for Moldova for the following three categories: "Aquaculture products and seaweeds", "Processed agricultural products for use as feed" and "Vegetative propagating material and seeds for cultivation".

Several organic growers and processors have selected to be certified by an EU-recognized inspection body and, as they don't sell their products to the local market, are not inspected by a local inspection body and are out of the National Organic Certification System. MAFI is aware about their activities, but hasn't implemented a consistent system of collecting data about these companies. Few official data exists about their activity (area, volume and value of products, etc.).

Table 5: Moldovan organic companies certified by EU-recognized bodies

Certification body	Name of the Moldovan certified operator	Field of activity
CERES	IM Nova Nut SRL	Walnut in shell, walnut kernels
	Pieralex SRL	Walnut kernels
	Minunata Xenia SRL	Walnuts, sour cherries, white and red mulberries, sea-buckthorn, red chokeberry, blackthorn
BCS Öko-Garantie	Maestro-Nut SRL	Walnut kernels, Walnuts in shell
	Prometeu-T S.A.	Walnuts, Walnut kernels, Walnuts in shell
	Monicol SRL	Plums, dried, Peaches, Plum puree concentrate, Plums, Pears, Walnut kernels, Hazelnuts in shell, Walnuts in shell
SGS	Lion Gri SRL	Wines
Control Union Certifications B.V.	Black Sea Seeds SRL	Phaseolus vulgaris, phacelia tanacetifolia, anethum graveolens, cucumis sativus, cucurbita pepo, eruca sativa

Source: Data collected from the websites of the certification bodies

Considering that *Table 5* includes the largest Moldovan walnut exporters, the true size of the Moldovan organic farming sector is significantly larger than presented in *Section 3.3 - Trends in the National Organic System* in the part regarding the perennial crops.

3.5 ACTORS INVOLVED IN THE ORGANIC SECTOR

3.5.1 Government institutions

Within the Ministry of Agriculture and Food Industry, a special unit was created to support the development of the organic farming – the "Organic Farming and Products of Origin" Service. The Service initiates the development of the pertaining regulations, leads the Commission for authorisation of inspection and certification bodies, maintains the Register of organic farmers, and coordinates the public policies in the field of organic farming through a sector development program.

The first sector development program was included in Government Decision No. 149 of 10/02/2006. In 2010 the program was updated by the staff of the Service based on the achieved progress and new challenges, but didn't pass through the Government approval mechanism.

3.5.2 Research and Development, extension service and crop advisors

The key institution for fundamental and applicative research related to organic farming in Moldova is the Institute of Genetics, Physiology and Plant Protection – IGPPP (recently established by the merger of another two institutions). Its directions of activities involve several key aspects for organic farming, such as genetics, plant physiology, seed production and amelioration, and biochemistry. Additional contributions to the organic agriculture are brought by the Research Institute of Field Crops "Selectia", Institute of Pedology and Agrochemistry "N.Dimo", Centre for Applied Pedology, Agrarian University and the Practical Scientific Institute of Horticulture and Food Technology.

The researchers of these institutes are involved in several research projects that have application for organic farming. For example, IGPPP budget for last year was around 1.3 million EUR used to finance 22 fundamental and applicative research projects. A key complaint of Moldovan organic farmers is that too frequently research findings are not translated into practical tools for application in their farms.

In 1999 the Center of Advanced Biological Technologies (CABT) was established by a group of scientists from the former Institute of Genetics & Plant Physiology of the Academy of Sciences of Moldova to commercialize some the developed technologies.

National Agency for Rural Development (ACSA), the non-governmental, non-profit and non-political organization having the role of the National Extension Service doesn't provide specialised assistance in the field of organic farming. The development of organic sector of Moldova is seriously constrained by the lack of crop advisors – a link between researchers and farmers – that could provide on-field guidance and consulting during the production process.

In 2006 the State Agrarian University of Moldova has enlarged the scope of its "Soil Science" Chair to include organic farming. Currently "Agroecology and Soil Science" Chair has three priority components:

- Educational, including preparation of licenced specialists in the field of agroecology;
- Fundamental and applicative research with focus on soil science;
- Extension services.

If the growers involved in conventional agriculture have several guides and manuals covering the entire production technology, this type of holistic materials is missing for the organic farmers.

3.5.3 Non-governmental organizations

A series of local NGOs, such as ProRuralInvest NGO, Bios NGO and Cutezatorul NGO, are actively promoting the concept of organic farming, primarily with funding from international donors. Usually the projects targeting organic farming are of small scale, and are mainly oriented at raising awareness among farmers and consumers about various aspects of organic farming.

In 2010 the National Association of Organic Farmers "APEM - AGRO" was established. The Association promotes the products of its 40+ members by organizing joint stands at local and international fairs and tries to be the voice of the private sector in the dialogue with the Government.

3.5.4 Inspection and certification bodies

There are 6 accredited inspection and certification bodies accredited by the MOLDAC National Accreditation Centre and authorized by the Ministry of Agriculture and Food Industry:

1. Certificat-Eco SRL;

2. CRPA Inspect;
3. ÎCS „ICEA Group" SRL;
4. ÎCS „Ecogruppo Italia-M" SRL;
5. ÎCS „BioZoo" SRL;
6. ÎCS „CERTROM-MOL" SRL.

4 certification bodies are connected with parent organizations in EU (Italy – 3, and Romania – 1). By far the largest area is certified by BioZoo (77%), followed by Eco Gruppo (16%).

Table 6: Key data on the activity of the organic certification bodies in Moldova

Certification body	Nr. of organic producers		Area, ha	
	Certified	In-conversion	Certified	In-conversion
CRPA - Inspect	10	13	2.687	332
ICEA - Group	---	8	338	252
Certificat - Eco	---	18	---	189
Eco Gruppo		2	5.870	2.164
BioZoo	6	2	33.482	6.417
SUB-TOTAL	***16***	***43***	***42.327***	***9.354***
TOTAL	**59**		**51.681**	

Source: MAFI, TAIEX Workshop on development of organic farming in Moldova - Adding value to agricultural production, 2014

One alleged fraud case involving the former parent company of ÎCS „BioZoo" SRL is under on-going investigation by the Italian authorities under the name of "Vertical Bio". As this could involve the largest Moldovan organic certification body by controlled area, it is advised to MOLDAC and MAFI to closely monitor the situation and initiate timely actions in order to prevent damage to the image of the nascent Moldovan organic sector. This should involve review of the conflict-of-interest policies and their application, especially for potential cases when the certification body serves as a consultant for the grower, or is involved in the trading with the grower's products.

3.6 ACCESS TO INPUTS, TECHNOLOGIES AND RESOURCES

3.6.1 Seeds

The application of organic principles enables employment of local resources, including local seed varieties. The Moldovan researchers and their institutions released a series of seed varieties for some major crops (corn, wheat, apples, walnuts, grapes, etc.) with resistance to diseases and biotic and abiotic stress. Still, these varieties do not cover the entire spectrum of crops, and there are problems with the availability of high-quality seedling materials of these seed varieties. As result, there is a need to import the seed material from nearby countries. The Moldovan regulations don't allow the grower to import seeds of varieties that are not included in the Catalogue of Plant Varieties. The process of variety testing and registration should be initiated by the breeder; in the case of Moldova most international breeders are not interested in the Moldovan market, and as result the Moldovan farmers don't have access to the new crop varieties tailor-made for organic farms.

The EU Regulations and USDA's National Organic Program requires the use of organic seed when commercially available. However, the organic seed sector is almost non-existent in Moldova (only one company - Black Sea Seeds SRL – is a certified producer of seeds of some crops). The proposal for new organic farming regulations in EU significantly limits the possibility of "no organic seed available" waivers, so the Moldovan organic farmers inspected by EU-recognized bodies should expect more pressure from their auditors to use certified organic seeds.

3.6.2 Biotechnologies

The United Nations Convention on Biological Diversity defines biotechnology as: "…any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use."

Crop biotechnologies have developed incrementally over the past century, but progress has accelerated greatly over the last two decades leading to many important scientific achievements and impressive technological advances[19]. A range of crop biotechnologies is used in Moldova (such as micropropagation, bioprotection, and biofertilization), although most of them are still at piloting stage.

In Moldova, the Institute of Genetics, Physiology and Plant Protection has developed and implemented a range of biological means of plant protection and growth regulators. The products are commercialized by the Institute and its affiliated companies: Eco-Consult SRL and Alimeco SRL. The Institute has also partnerships with similar foreign organizations to make available their technologies to Moldovan farmers. The State Register of crop protection means and fertilizers include such products as Trihodermina Th-7F-BL (trichoderma harzianum), Trihodermina BL (trichoderma lignorum), Recol (extract from Reynoutria sachalinensis), Pelecol, Funecol (copper sulfate), Reglalg 1(spirogira spp.), Paurin (pseudomonas fluorescens), Verticilina granulara-BL (verticillium lecani), Rizoplan (pseudomonas fluorescens), and Virin series of viral products.

The researchers of the Institute of Genetics, Physiology and Plant Protection and its affiliate EcoConsult SRL are currently developing an integrated pest alert system ProBio based on a network of weather stations, available for all growers at http://www.eco-con.net. A similar system was already implemented by iMetos SRL based on Fieldclimate technologies developed in Austria.

Still, the biotechnological solutions of the Institute of Genetics, Physiology and Plant Protection do not cover the entire spectrum of the needs of the Moldovan organic growers. At the same time, the international manufacturers and suppliers are very reluctant to register their products in Moldova, because the potential market is judged to be very small, and the marketing and registration costs will not be justified by the subsequent sales.

The lack of the needed technologies on the local market is a serious problem for the existing organic growers, as it leads to higher costs and/or lower productivity, putting at risk the sustainability of their operations. It is also cited as a key barrier by the non-organic growers when discussing the possibility to enter into organic farming operations.

MAFI recognizes the problem and is trying to bring the international manufacturers to Moldova by organizing their visits to the country. For example, in 2013 the representatives of the large Spanish company AISA „Aditivos Intelegentes" visited Moldova, but so far none of their products in officially registered in the country.

Biotechnologies can be used to process organic waste so that it may be used in agriculture. For Moldovan conditions, the most relevant organic waste is the animal manure. Applying animal manure to a field is an effective way of increasing both nutrients and organic matter content in the soil. Animals typically pass, as waste, 75-90% of the nutrients they are fed. Animal waste materials usually contain the primary plant nutrients (nitrogen, phosphorus, and potassium), the secondary plant nutrients (calcium, sulphur, and magnesium), and some minor plant nutrients (such as zinc, copper, boron, iron, and manganese).

---

[19] FAO, Biotechnologies for Agriculture Development (http://www.fao.org/docrep/014/i2300e/i2300e.pdf)

Organic certification may require that manure be composted[20] before application, depending on its source. For example, the National Organic Program in the USA provides guidelines for the use of raw animal manure which must be composted unless it is:

- Applied to land used for a crop not intended for human consumption;
- Incorporated into the soil not less than 120 days prior to harvest of a product whose edible portion has direct contact with the soil surface or soil particles;
- Incorporated into the soil not less than 90 days prior to harvest of a product whose edible portion does not have direct contact with the soil surface or soil particles.

Supplying nutrients organically is a challenge for the long-term development prospects of the Moldovan organic farming, as the availability of animal manure drastically decreased with the move of the Moldovan animal husbandry from large-scale operations in the household sector and very few composting operations exist in the country.

With funds from the Agency for Innovation and Technological Transfer, the technology of vermicomposting was developed and piloted. Current suppliers of vermicompost include Agros-Intex SRL, Antonii SRL, Viermeco SRL and a couple of family farms. The World Bank Agricultural Pollution Control Project and GEF/UNDP Living Water Exchange projects have piloted with relative success the concept of centralized manure composting facilities. Unfortunately, this experience wasn't taken up by other communities because of lack of technical knowledge and community organizational skills.

[20] Composting is the controlled aerobic biological decomposition of organic matter into biologically active humus as a result of intense microbial activity.

3.7 SWOT FOR ORGANIC AGRICULTURE IN MOLDOVA

STRENGTHS	WEAKNESSES
• Traditions and experience in production of wines, fruits and vegetables • High share of private agricultural land • Proximity to developed markets with growing demand for organic food • R&D institutions with large experience in organic farming approaches • Preferential access to EU market – the largest market for organic food – for most of agricultural crops • Recognition of importance of the organic agriculture in attaining the objectives of the National Agriculture and Rural Development Strategy 2014 – 2020	• Reliance on imported inputs and limited access to quality inputs • Poorly-financed agrifood sector and limited access to equity and loans • Obsolete or isolated education system and extension service, with limited relevance to organic agriculture • Poor interconnection between R&D system and the private farmers • Lack of coordination in the supply chain • Poor organization and cooperation among producers • Subsidy support measures in continuous process of change with impossibility for long-term planning of organic operations • Lack recognition of equivalency from EU of the National Organic Certification System • Poor communication of Moldovan organic offer to potential local and foreign buyers and consumers
OPPORTUNITIES	**THREATS**
• Increased demand for organic food in EU • Increased demand for organic food on the local market • Synergies and economies of scale for marketing cooperation among organic growers • Synergies from development of connected activities (agro-tourism, folkloric festivals, etc.)	• Difficulty to meet the ever stricter organic regulations in key export markets such as EU and USA

3.8 KEY PROGRAMMES AND POLICIES THAT CAN PROVIDE FINANCIAL AND OPERATIONAL SUPPORT TO THE ORGANIC SECTOR DEVELOPMENT

The public support measures for the development of the organic farming should recognize the multitude of its beneficiaries: the consumer, the public and the grower itself. Organic production is at the same time:

• A production method in line with the **preference of certain consumer** for products using a natural substances and processes (impact for the CONSUMER)	Therefore it should be rewarded by the markets and hence be financed by the consumers
• An overall system of farm management and food production that combines best **environmental practices** and a high level of **biodiversity** with the **preservation of natural resources** (impact for the PUBLIC)	Seen from this angle, the development of organic farming should be driven by society.

Based on this analysis and building upon the achievements already accomplished, the Government of Moldova should update its National Program regarding Organic Agrifood Products (approved as part of GD 149 of 10.02.2006) along the following strategic directions:

Objective 5. Information-led development of the organic food market, by increasing consumer awareness, providing more information and promotion to consumers and operators, stimulating the use of the national organic logo, providing more transparency to the local and foreign buyers, and improving the availability of production, supply and demand statistics as policy and marketing tools;

Objective 6. Improvement and reinforcing of the national organic farming regulations, import and inspection requirements, increasing transparency and consumer confidence, and increasing the efficiency and transparency of the inspection system;

Objective 7. Improving the access of the farmers to the inputs, technologies and resources;

Objective 8. Making public support for organic farming more effective by a more coherent support from the Agriculture Subsidy Fund and National Ecologic Fund, and by strengthening research on organic farming.

Specific actions required for Objective 1:

- Re-design of the current national organic logo;
- Approval by the GoM of the regulations regarding the use of the national organic logo;
- Clarify the institution responsible for the official control of the local market regarding the use of the national organic logo and the use of wording “bio”, “eco”, “organic” for agrifood products;
- Establish a private-public partnership between MAFI and the Organic Farmers Association for the management of the national organic logo;
- Create a website under direct control of MAFI explaining to the consumers the concept of certified organic farming and listing the Moldovan organic farmers;
- Implement annual consumer information campaigns with support from the National Environmental Fund;

- Develop generic business plans for growing, processing and marketing of various organic crops and mixes thereof, to demonstrate to farmers and potential investors the existence of markets and the economic feasibility of organic agriculture in Moldova.

Specific actions required for Objective 2:

- Recognize the equivalence of the inspections and certifications performed by EU-recognized certification bodies in the Republic of Moldova. This will avoid unnecessary costs for the export-oriented growers and will allow a better monitoring of the national organic sector;
- Further harmonisation with EU regulations, preferably on an annual basis to avoid big discrepancies between Moldovan and EU regulations. This will include completing the standards for areas not yet covered, such as wine;
- Adopt EU approach regarding the frequency, timing and duration of inspection and certification visits;
- Review the rules governing the inspection and certification bodies and perform an audit of their enforcement in order to avoid conflicts of interest;
- Apply for and obtain the status of "Authorized Country" by the European Union (Commission Regulation No 1235/2008) by demonstrating the equivalency of Moldovan regulations and control system with those laid down in EU.

Specific actions required for Objective 3:

- Introduce import derogations for seed varieties imported by the organic farmers for the cases when the local market doesn't offer similar-performing varieties and the required variety is not included in the National Catalogue of Plant Varieties;
- Introduce import derogations for biotechnologies to be used by organic farmers that are not included in the State Register of Crop Protection Means and Fertilisers;
- Create a website listing and describing the practices and technologies available in Moldova that can be used by the organic farmers and the conventional agriculture farmers wishing to increase the sustainability of their operations. Additionally, provide contact information of the researchers and crop advisors that offer implementation support;

Specific actions required for Objective 4:

- The current system of top-up subsidies for enlarging of organic agriculture areas should be maintained;
- Based on the model of EU, introduce conversion and maintenance payments for certified organic growers as payments for ecosystem services and benefits they provide. The payments will be disbursed by AIPA and funded from the resources of the Agriculture Subsidy Fund and/or National Environmental Fund;
- Strengthen research on organic farming by:
    - Focusing the R&D efforts on the priority directions discussed with the private sector;
    - Putting more focus on the implementation aspects of the R&D activities;
    - Improve coordination of the R&D institutions with Agency for Innovations and Technology Transfer.

An Organic Research Program that identifies the critical development areas and urgent needs is an important tool. It helps funders (GoM, international development partners, foundations, private sector) prioritize among different projects and facilitates coordination of inputs. A research program also serves as a guide and inspiration for research institutions and individual researchers who are interested in organic agriculture and sustainable development of the food sector. A research program should point out urgent production problems that need to be solved, but also more complex issues implying changes

in the whole food sector, from primary production to processing and marketing. At the same it must be based on the internationally agreed-upon principles and international, national and local goals for organic farming.

For the highest relevance of research, a research program should involve all interested stakeholders. The elaboration of such a program should involve farmers, market actors, extension workers, processors, NGOs, government authorities, and others. The program should point out possibilities, and the work should contain mechanisms for evaluation and for distribution and application of research results.

4 Improving Agriculture Subsidization to Support Greening and Growing the Organic Sector in Moldova

4.1 ANALYSIS OF THE CURRENT SYSTEM IN AGRICULTURE SUBSIDIES

4.1.1 Analysis of Existing Legal Framework Governing the Subsidization Processes

The current system of supporting the agricultural producers through subsidies stems from two financial mechanisms established in 2005:

- The fund for support to establishment of vineyards was established by Parliament Decision No. 21 of 08.04.2005;
- The fund for subsidization of agricultural producers was established by Parliament Decision No. 381 of 29.12.2005, and included 8 support measures:
    - Support for producers of sugar beet;
    - Support for tobacco producers;
    - Support for establishment of fruit plantations and fruit nurseries;
    - Support for procurement of crop protection means and fertilizers (reimbursement of the 20% VAT);
    - Support for animal husbandry sector;
    - Support for the producers selling their products on the local market.

In 2007 the Government Decision No. 1305 of 28.11.2007 approved the Concept of the Agricultural Subsidy System for Agricultural Producers for 2008-2015, that stressed the importance of supporting long-term investments as opposed to covering the operational costs, the main objective of several measures available at that time.

During the last couple of years, the key support measures addressed the priorities identified in the National Strategy for Sustainable Development of the Agro-industrial Complex of the Republic of Moldova (2008-2015), approved by Government Decision No.282 of 11.03.2008 and the periodic Government Activity Plans[21].

To improve the management of the Agricultural Subsidy Fund, through its Decision No.60 of 04.02.2010 the Government established the Agricultural Intervention and Payment Agency (AIPA), as an institution under MAFI.

The exact amount of support available from the Agricultural Subsidy Fund is determined by the annual State Budget and in some years is subject to additional financing. At the beginning of each year, the Government approves a Regulation detailing the measures available in a given year, eligibility criteria, ceiling amounts, etc. The draft Regulation is developed by MAFI after review of the Fund activity jointly with the representatives of the agricultural producers and other relevant ministries.

The Agricultural Subsidy Fund operates on first-come first-served basis. At the current support rates, the annual value of the Fund is consistently lower than the value of subsidy applications. During the last couple of years, the Government has adopted a special financing mechanism that prevents the creation (existence) of any outstanding debts of the Fund at the end of each budgetary year, without increasing the Fund value. This is achieved by proportionally allocating the last 30% of the Fund to the farmers that applied for support after the first 70% of the Fund were disbursed.

[21] The Government Activity Plans since 2005 year are available here: www.gov.md/lib.php?l=ro&idc=445

4.1.2 Analysis of Existing Support Measures in the Agricultural Subsidy Fund

Since its establishment, Agricultural Subsidy Fund passed through a trial-and-error process with several support measures, before coming to the current set of 10 support measures backed in 2014 by a budget of 500 million MDL (around 27 million EUR):

1. Stimulation of loans taken by agricultural producers (interest rate subsidy);
2. Stimulation of insurance of agricultural risks (insurance subsidy);
3. Stimulation of establishment of perennial plantations (investment subsidy per hectare, varying according to crop and planting scheme);
4. Stimulation of investments in production of vegetables under cover (investment subsidy calculated as percentage of investments made in assets eligible for support);
5. Stimulation of investments in procurement of agricultural machinery and tools, including irrigation systems (investment subsidy calculated as percentage of investments made in assets eligible for support);
6. Stimulation of investments in equipment and technologies of animal husbandry farms (investment subsidy calculated as percentage of investments made in assets eligible for support);
7. Stimulation of procurement of breeding stock and maintenance of their genetic fund (investment subsidy per unit procured, varying according to species);
8. Stimulation of post-harvest and processing infrastructure (investment subsidy calculated as percentage of investments made in assets eligible for support);
9. Stimulation of consolidation of agricultural land (subsidy calculated as percentage of the eligible costs incurred during land consolidation);
10. Stimulation of irrigation of agricultural land (subsidy calculated as percentage of electricity costs for water pumping).

Since establishment of AIPA in 2010, the Agricultural Subsidy Fund has provided support for more than 15 thousand farmers. More than 100 million EUR were disbursed by AIPA to support the planting of new orchard and vineyards on 17 thousand hectares, construction of 170 hectares of greenhouses and tunnels, procurement of 4700 units of agricultural machinery, installation of 450 irrigation systems, renovation of 82 animal farms, construction and renovation of 114 cold storage and packinghouses, renovation and retooling of 107 agricultural processing units[22].

There are 4 main contentious points of the current system:

- Usually the investment process takes longer than the 1-year cycle of changing the Fund Regulations, and the provided support could be lower than expected at investment planning stage;
- The subsidies are provided after all costs are incurred by the farmer. This helps AIPA to make sure only fully-implemented activities are supported, but the drawback is the limited access to subsidies for smaller farmers that have a more difficult access to external financing such as bank loans;
- There are still measures supporting operational costs (such as interest rate subsidies) that could be removed, with funds going for increased investment subsidies;
- Insufficient integration of environmental aspects in the support measures.

[22] Based on the data provided in National Agriculture and Rural Development Strategy 2014-2020 approved by Government Decision Nr. 409 of 04.06.2014

4.1.3 Assessment of Gaps and Arrears related to Greening of the Agriculture

"Efficient utilization of natural resources and environment conservation" is one of the major objectives of the support provided through the Agriculture Subsidy Fund[23]. This is achieved by:

5. Increased support to organic growers: higher support rates for organic growers are included in 3 out of 10 support measures;
6. Increased support for the procurement of agricultural machinery that could be used in conservative agriculture operations: there is a higher support rate in Measure 5 for the procurement of a no-till planter as opposed to a simple precision planter;
7. Eligibility of support for some agriculture machinery used in soil conservation and waste management operations: Measure 5 support is provided for procurement of balers and pruning choppers;
8. Requirements for the presence of the State Ecological Assessment (expertiză ecologică de stat) for the newly constructed post-harvest and processing units (Measure 8) and cattle farms (Measure 6).

4.1.4 Assessment of Gaps and Arrears related to Organic Sector Development

The measures of the Agriculture Subsidy Fund are available to all growers, including organic growers. Additionally, there is a subset of measures explicitly targeting the organic growers included in the National Organic Certification System (both certified and in-conversion operations):

- Measure 1 "Stimulating farmers lending by financial institutions" has an increased support ceiling for the interest rate subsidy: 200 thousand MDL (15 thousand USD) for loans directed to organic farming development versus 100 thousand MDL for other types of agricultural loans (7.5 thousand USD);
- Measure 3 "Support for investments in establishing of multiannual plantations" provides increased investment subsidies for the establishment of organic plantations: additional 5000 MDL/ha ($370/ha) for fruit, grape, nut and berry plantations and additional 2000 MDL ($150/ha) for aromatic crops (rose oil, lavender, hyssop and sage);
- Measure 4 "Support for investments in production of vegetables in protected areas" increases the support for organic farming by 10% of the value of eligible investment versus the support received by conventional growers.

Table 7: Support from the Agriculture Subsidy Fund in 2012 and 2013 years

Support measure	Number of applicants		Value of support, MDL	
	2012	2013	2012	2013
Measure 1	0	11		959.944
Measure 3 – grapes	0	1		594.300
Measure 3 – other	5	4	995.800	595.250
Measure 4	0	0		
TOTAL:	**n/a**	**n/a**	**995.800**	**2.149.494**

Source: MAFI, TAIEX Workshop on development of organic farming in Moldova - Adding value to agricultural production, 2014

There are two main contentious points of the current system:

- Support is provided only for organic growers that are part of the National Organic System. The export-oriented organic growers that are certified only by EU or US certification bodies are not eligible for the specific support for organic agriculture offered by the Subsidy Fund;

[23] Government Decision No. 135 of 24.02.2014 regarding allocation of resources of the Agriculture Subsidy Fund for 2014 year

- The environmental services provided by the organic growers are disregarded.

The current system is applied since 2012, and it superseded a totally different approach used in years 2008-2011:

- Conversion to organic agriculture was supported by specific area subsidies during the first two years of conversion (three years for multiannual crops). The conversion payments weren't crop specific as in EU: 700-800 MDL/ha ($60/ha) for the first year of conversion and 400 MDL/ha ($35/ha) for the second and third year of conversion. In some years, the support was limited to the first 100 ha managed by the organic grower;
- Price support was provided to organic growers by a subsidy equal to 20% of the value of organic products sold on the local market (in 2009 there was an additional export subsidy equal to 40% of the value of exported organic products).

The price support subsidy was the most controversial support measure of the Fund as it was considered by many as "easy to be abused" measure (it is difficult for a third party to verify the yields from the organic areas).

4.2 CONCEPT PROPOSAL ON IMPROVING THE AGRICULTURE SUBSIDIES SYSTEM

4.2.1 Financing framework

The recently approved National Agriculture and Rural Development Strategy 2014-2020 recognizes the importance of environmentally friendly agriculture management, by setting "Sustainable Management of Natural Resources" as one of its three strategic priorities.

The Strategy includes three supporting measures:

- Measure 2.1. Support for the land and water management practices, including land consolidation, crop rotation, irrigation systems and equipment;
- Measure 2.2. Support for environmentally-friendly production technologies and approaches, including organic farming, biofuels, and reforestation of eroded land;
- Measure 2.3. Support for adaptation and mitigation of climate change risks.

As part of its financial planning, the Strategy envisions to allocate for Priority 2 "Sustainable Management of Natural Resources" around 30% of total available financial resources with the following breakdown: for Measure 2.1 –20%, for Measure 2.2 – 5%, and for Measure 2.3 – 5% of total available resources.

Table 8: Expected results and progress indicators for Priority 2 "Sustainable Management of Natural Resources"

Indicator	Measurement	Unit	Target
Sustainable management of natural resources	Share of land under sustainable management practices in total agricultural land	%	Increase by 70%
Support for the sustainable management of land and water	Number of land parcels	number	Decrease by 15%
	Area of irrigated land	Ha	Increase by 50%
Support of organic technologies and products and assurance of biodiversity	Area under no-till technology	Ha	Increase by 100%
	Area under organic farming	Ha	Increase by 60%
	Area under energy crops	Ha	3000 ha

Indicator	Measurement	Unit	Target
	Area of reforested land, including protective forest strips	Ha	Increase by 7000 ha
Support for climate change adaptation and mitigation	Costs for climate change adaptation and mitigation measures	MDL	Increase by 70%

Source: National Agriculture and Rural Development Strategy 2014-2020

The Strategy envisions using the Agriculture Subsidy Fund as a key tool toward achieving the above-mentioned targets. A series of changes in the measures and regulations of the Agriculture Subsidy Fund are needed to support a better use and targeting of the limited State Budget resources.

4.2.2 Elimination of environmentally harmful or demotivating subsidies

The first priority for the "greening" of the Agricultural Subsidies System is to abolish or modify those that clearly promote unsustainable practices or demotivate farmers from applying environmentally-friendly practices and technologies.

The current Measure 10 "Stimulation of Irrigation of Agricultural Land" provides for 50-80% reimbursement of electricity costs associated with water pumping from central irrigation systems. Although it clearly wasn't the intention of this measure, this discourages farmers from investing in energy-saving water pumping solutions. ***It is recommended to apply a fixed subsidy per cubic meter of pumped water***, as currently applied for water pumped from sources other than the central irrigation systems.

Currently, by not linking the subsidies with the mandatory legal environmental requirements, the Government misses an opportunity to promote environmentally-friendly practices and technologies. ***It is recommended to introduce the cross-compliance mechanism*** using the model of the European Union (see Section "*Best Practices in Greening the Agriculture in the European Union"* in *Annex 4. Best Practices in Public Sector Support for Greening the Agriculture*). A checklist of priority requirements of relevant national regulations should be developed jointly by the Ministry of Agriculture and Food Industry, AIPA, and the Ministry of Environment and used to verify compliance of applicants for agricultural subsidies. A potential stumbling block is the object of control: should the entire farm be assessed or just the area directly linked to the investment for which subsidies are demanded? In European Union, this problem is not relevant, as under the Single Payment Scheme the subsidy payments are done to farmers per area of agricultural land maintained in cultivatable condition, and cross-compliance criteria are applied to the entire area for which subsidies are demanded.

4.2.3 Introduction of "market smart" subsidies

All environmentally-friendly technologies or technical solutions enabling better farming practices should be eligible for Agricultural Subsidies System. The introduction in 2013 of weather stations in the list of eligible investments under Measure 5 "Stimulation of investments for procurement of agricultural equipment and tools" was a right step in support of better crop protection decisions, but its elimination in the subsequent year is incomprehensible considering the definite priority of the Government to integrate environmental considerations in the Moldovan farming systems. Another contradiction is the eligibility of sprayers (of pesticides and chemical thinners), and the non-eligibility of mechanical blossom thinning machines. The Governmental institutions shouldn't reject the inclusion of innovative solutions in the Agricultural Subsidies System solely because they are rarely used in Moldova. On the contrary, the subsidies should be used to introduce and promote new environmentally-friendly approaches.

Another "market smart" subsidy that should be included in the Agricultural Subsidies System is ***area-based subsidy for organically-cultivated land***, as payment for environmental services provided by the

organic farms. This measure should be available for both in-conversion and certified farmers. A differentiated scale per type of crop should be adopted, based on the model of the European Union (see Section "*Public support of organic farming in the European Union"* in *Annex 4. Best Practices in Public Sector Support for Greening the Agriculture*). As opposed to the current practice of annual review of support measures, the area-based subsidies for organic farmers should be based on 4- or 5-years long contracts, in order to take into consideration the particularities of converting to and maintaining organic farming approaches.

Currently the Government of Moldova (Ministry of Agriculture and Food Industry, AIPA, and the Ministry of Environment) implements the Moldova Agriculture Competitiveness Project (MAC-P) funded by the World Bank and the Global Environment Fund. One of the project's components provides financial support in the form of ***matching investment grants*** to farmers for piloting the adoption of ***sustainable land management practices*** and technologies; and investment support for the ***rehabilitation of anti-erosion shelterbelts*** with the purpose of maintaining and enhancing the productivity of agricultural land. After the first round of disbursement of the matching grants is completed, it is recommended to review the program in order to permanently introduce a similar measure in the Agricultural Subsidy System covering the entire spectrum of sustainable practices, including water management and soil management. The best approach would be to have a roster of accredited service providers (consultants) that develop environmental management plans for interested farmers, and AIPA to agree to provide subsidies for the measures included in those plans.

The Measure 2.2 "Support for environmentally-friendly production technologies and approaches" of the National Agriculture and Rural Development Strategy also discusses ***reforestation of eroded land***, with an implied assumption to support this process through the Agricultural Subsidy Fund. However, this fund is not listed in the Law No. 1041 of 15.06.2000 regarding improvement of eroded land through afforestation; instead, the Law makes reference to the National Ecological Fund. The creation of a working group of representatives of agriculture and environment ministries and industry experts is required to develop the financing mechanism, and resolve potential legal constraints.

Annexes

ANNEX 1. ORGANIC AGRICULTURE: HISTORY, PRINCIPLES, BENEFITS

According to FAO/WHO Codex Alimentarius, organic agriculture is "a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system".

Presently, the most distinguishable advantages of organic agriculture against conventional agriculture refer to the use of pesticides (restrictions to use pesticides enhance underground waters quality and pesticides residuum in food products), the use of plant nutrients (organic food is associated with less in rates of nutrients in food products), soil protection (crop rotation, mixed grassland, cultivating crops that retrieve and consume soil nitrogen surplus etc.), enhancing biodiversity (conservation of natural habitats).

The global concept of organic agriculture starts from two major social implications:

A. Organic agriculture is a unique method of manufacturing food products, which created a specific market for organic products and clients ready to buy these products, usually, at a higher price. From this point of view, organic agriculture is financed by the consumers who see their advantage in its benefits. In this context, organic agriculture is governed by market rules.
B. Organic agriculture is also known for delivering public goods, mostly ecological benefits, but also public health, social and rural development, and biodiversity welfare. In this case, one emphasizes farmers. land management. This delivery of public goods can be also supported by public money. From this angle, organic agriculture development is also a choice of politics, mostly based on environment protection policies.

Both roles of organic agriculture make their contribution to enhance farmers' earnings, while economic opportunities for the food value chain stakeholders derive from market mechanisms.

Organic agriculture brings a type of reengineering of agriculture business - this means a fundamental rethinking of production processes in order to dramatically enhance the links between the market, the producers and the clients, in order to suppress operation costs and increase competitiveness. The theories prove that the viability of this process also depends on how intense is the collaboration between agriculture and environment policy makers, as well as on how much the Government is ready to adopt a multidimensional stand that promotes the ecologic balance equilibrium in strategies targeting social and economic development. This must also be in line with increasing social welfare and social coherence.

The History and Development of Organic Agriculture in the World

It is quite difficult to determine when organic agriculture first emerged. Its concept existed before the invention of synthetic agrochemicals. However, as an independent branch of organic agriculture it has been formed in the early 20th century. The concept of organic farming was firstly introduced by Lord Northbourne, an expert on agriculture at the University of Oxford, used in his book "Take Care of the Earth" published in 1940.

One of the founders of organic agriculture was Albert Howard, the British botanist. His book "Agricultural Testament," published in 1940, had an enormous impact on many scientists and farmers.

Howard described the negative impact of chemical fertilizers on the health of animals and plants, proposed a system of soil fertilizing, based on the use of composts from crop residues and manure.

In 1939 Eve Balfour under the influence of Howard's work put the world's first scientific experiment on agricultural lands in the UK to compare traditional and organic agriculture. 4 years later she released her book "Live Soil". The work was widespread and has led to foundation of today's one of the most well-known organizations for organic farming – Soil Association.

An important contribution to the development of organic agriculture has been made by Rudolph Steiner, who created the first comprehensive work devoted to organic farming: "The Spiritual and Scientific Fundamentals for Successful Development of Agriculture".

In the United States in 1943 Louis Bromfield published his book "Pleasant Valley", which describes his agrarian experience in Ohio, USA. Bromfield was an active supporter of the agricultural practices that promote soil conservation, besides he supported most of Howard's ideas. In his book "Farm in Malabar" published in 1948 Bromfield described his experience of organic farming on his farm.

However, the most powerful carrier of new ideas in the United States was Jerome Irving Rodale. Rodale was one of the first who popularized the term "organic agriculture". In 1942 he founded the magazine "Organic Farming and Gardening". In 1950 Jerome Irving Rodale founded another magazine - "Prevent", which set out the philosophy of organic agriculture. In the 1954 the editions were managed by Rodale's son Robert Rodale. Unlike his father, who focused on the fact that organic products are the most useful for the health, Robert Rodale regarded the social and environmental benefits of these products. In 1971 Robert founded the Rodale Research Center, which is now called "Rodale's Institute of Experimental Farming".

Organic agriculture in Japan has started to develop about 100 years ago. An important contribution to its development was made by Japanese philosopher Mokichi Okada. He paid particular attention to the so-called "nature farming", the principles of which largely correspond to the modern organic farming.

What is Organic Farming?

Organic farming (also known as ecological or biological farming) is commonly recognised as a farming system that excludes the use of synthetic fertilisers and pesticides. This is a rather simplistic view of organic agriculture as it differs from other farming systems around the management of the entire system. Organic farming is a clearly defined production system that takes a holistic approach to production, considering the entire farm or production system as an ecological unit.

Central to the organic farming system, in terms of physical production, is the management of the soil. Soil is managed in such a way as to optimise soil health through the management of the inorganic and organic soil factors to enhance biological processes that improve plant health. Crop combinations and rotations are managed in such a way as to improve plants' competitive ability and create a favourable environment for the presence of natural predators of crop pests. In livestock, animals are managed to enhance natural resistance to pests and diseases though good nutrition and management practices such as interrupting host/pathogen relationships. These practices reduce the necessity for external inputs to manage disease and fertility.

Organic farming is not only about managing the soil – plant – environmental interaction in a holistic manner – it also has food quality, human health, animal welfare and socio-economic aims. As a result of these principles and philosophies, organic food has a strong brand image in the eyes of the health-, environment- and socially-conscious consumer. Organic agriculture is therefore not only driven by farmers' philosophical approaches to agriculture, but is also drawn by consumer demand. This strong

brand image combined with generally limited supply means that organic produce can command higher prices for retailers and farmers than conventionally produced food.

There is no universally recognised definition or description of organic farming. A good working definition is provided by the International Federation of Organic Agriculture Movements (IFOAM)[24]:

"Organic Agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved."

According to IFOAM[25], organic agriculture is based on four fundamental principles:

1. ***The principle of health:*** *Organic Agriculture should sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible.*
   - The health of individuals and communities cannot be separated from the environment.
   - The role of organic agriculture is to sustain and enhance the health of ecosystems and organisms. Organic agriculture aims to produce high quality, nutritious food that contributes to preventive health care and well-being. It should avoid the use of fertilisers, pesticides, animal drugs and food additives that may have adverse health effects.
2. ***The principle of ecology:*** *Organic Agriculture should be based on living ecological systems and cycles, work with them, emulate them and help sustain them.*
   - Organic Agriculture is rooted within living ecological systems and production is to be based on ecological processes and recycling.
   - Organic farming, pastoral and wild harvest systems should fit the cycles and ecological balances in nature and organic management must be adapted to local conditions, ecology, culture and scale. Inputs should be reduced by reuse, recycling and efficient management of materials and energy in order to maintain and improve environmental quality and conserve resources.
   - Organic agriculture should attain ecological balance through the design of farming systems, establishment of habitats and maintenance of genetic and agricultural diversity. Those who produce, process, trade, or consume organic products should protect and benefit the common environment including landscapes, climate, habitats, biodiversity, air and water.
3. ***The principle of fairness:*** *Organic Agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities.*
   - Fairness is characterised by equity, respect, justice and stewardship of the shared world, both among people and in their relations to other living beings.
   - This principle emphasises that people in organic agriculture should conduct human relationships in a manner that ensures fairness at all levels and to all parties, should provide everyone involved with a good quality of life, contribute to food sovereignty and reduction of poverty. Animals should be provided with the conditions and opportunities of life that accord with their physiology, natural behaviour and well-being.
   - Fairness requires systems of production, distribution and trade that are open and equitable and account for real environmental and social costs.
4. ***The principle of care:*** *Organic Agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment.*

[24] http://infohub.ifoam.org/en/what-organic/definition-organic-agriculture
[25] http://infohub.ifoam.org/en/what-organic/principles-organic-agriculture

- Organic Agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment.
- Organic agriculture is a living and dynamic system that responds to internal and external demands and conditions. Practitioners of organic agriculture can enhance efficiency and increase productivity, but this should not be at the risk of jeopardising health and well-being. Consequently, new technologies need to be assessed and existing methods reviewed. Given the incomplete understanding of ecosystems and agriculture, care must be taken when introducing new technologies.
- This principle of care views precaution and responsibility as key concerns in management, development and technology choices in organic agriculture. Science is necessary to ensure that organic agriculture is healthy, safe and ecologically sound. However, scientific knowledge alone is not sufficient. Practical experience, accumulated wisdom and traditional and indigenous knowledge offer valid solutions, tested by time. Organic agriculture should prevent significant risks by adopting appropriate technologies and rejecting unpredictable ones, such as genetic engineering. Decisions should reflect the values and needs of all who might be affected, through transparent and participatory processes.

Demonstrated Benefits of Organic Farming

Food Security and Long Term Productivity

According to the FAO[26], "*Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life.*"

The review of available studies shows that organic agriculture can contribute to food security through:

- Increased productivity - particularly in areas prone to food shortages[27];
- Provision of safe food that supports a varied diet;
- Increased income or return on labour;
- Reduced costs of production;
- Risk reduction through diversification;
- Increased awareness of the need for sustainable production and consumption and the need to protect the environment;
- Supporting innovation, and recognising and integrating indigenous knowledge;
- Long-term sustainability.

Environment

FAO "Organic agriculture, environment and food security" paper provides a good summary of the environmental benefits of organic agriculture:

1. Soil

[26] http://www.fao.org/economic/ess/ess-fs/en/

[27] Gunnar Rundgren points out that converting from intensive conventional systems, a yield drop of 5-20% can be expected, while on irrigated land, yield tends to stay the same. Importantly, however in "traditional" rainfed systems, it is often the case that yields are increased after conversion to organic farming systems. (Rundgren, G. "Organic Agriculture and Food Security", IFOAM http://www.grolink.se/Resources/studies/117_Dossier_1_OA_and_Foodsecurity-1.pdf)

- Organic matter content is usually higher in organically-managed soils, indicating higher fertility and stability of organic soils as well as moisture retention capacity, which reduce the risk of erosion and desertification.
- Organically-farmed soils have significantly higher biological activity and a higher total mass of micro-organisms, making for more rapid nutrients recycling and improved soil structure. While the proportion of soluble nutrient fractions is lower on organically managed soils, there is no decrease in organic yields since higher biological activity and higher mycorrhizal root colonization counteract nutrient deficiency.

2. Water
   - Organic agriculture poses no risk of ground and surface water pollution through synthetic pesticides.
   - Nitrate leaching rates per hectare are significantly lower in organic agriculture compared to conventional systems.
3. Air
   - Organic agriculture enables ecosystems to better adjust to the effects of climate change and has a major potential for reducing agricultural greenhouse gas emissions.
   - Organic agricultural strategies, by recycling organic matter and tightening internal nutrient cycles, contribute to carbon sequestration.
4. Energy
   - Organic agriculture performs better than conventional agriculture on a per hectare scale, both with respect to direct energy consumption (fuel and oil) and indirect consumption (synthetic fertilisers and pesticides).
   - Efficiency of energy use of organic farms is high.
5. Biodiversity
   - Agricultural genetic resources, including also insects and micro-organisms, have all been shown to increase when land is farmed organically.
   - Wild flora and fauna within and around organic farms are more diverse and abundant than in conventional or integrated agriculture.
6. Ecological services
   - Organic agriculture offers vast food resources and shelter for beneficial arthropods and birds, thus contributing to natural pest control.
   - Organic agriculture contributes to the conservation and survival of pollinators, thanks to the banning of synthetic chemical pesticides and herbicides and the enhanced ecosystem diversity.
7. Landscape
   - Organic agriculture systems create diversified landscapes, which contributes to functional diversity and aesthetical values.
   - The establishment of semi-natural habitats within organic systems and the avoidance of pesticide use contribute to maintaining the biological connectivity and the larger ecological web, which benefit both agriculture and nature conservation.

It can therefore be reasonably concluded that (well managed) organic agricultural systems provide better environmental benefits (or less environmental harm) in most respects, when compared with conventional farming systems. Organic systems can counteract resource depletion (soil, water, energy, nutrients), contribute positively to climate change and can help to maintain and enhance biodiversity.

Social Benefits

It is generally accepted that organic farming operations offer greater social benefits than conventional agricultural systems. For example, IFOAM's basic standards include consideration of "quality of life

conforming to the UN Human Rights Charter to cover their basic needs and obtain an adequate return and satisfaction from their work, including a safe working environment" as well as consideration of "the wider social and ecological impact of the farming system". The broad recommendations from the IFOAM Basic Standards are as follows:

- Compliance with International Labour Organisation (ILO) conventions and UN Charter of Rights for Children;
- Access to potable water, food, housing, education, transportation and health services;
- Provision of basic social security needs of the employees, including maternity, sickness and retirement benefits;
- Equal opportunity and adequate wages when performing the same level of work regardless of colour, creed and gender;
- Adequate protection from noise, dust, light and exposure to chemicals within acceptable limits;
- Contracts should be fair, open to negotiation, and honoured in good faith.

In changing to organic farming practices, many aspects of the operation, including labour demand, social structures, and decision making processes change. Organic systems often require more labour input to replace external energy and capital inputs. Further, as a result of crop diversification, different planting and harvesting schedules associated with crop rotation practices, distributes labour demand through the season. These practices stabilise employment, reduce turnover, and reduce problems related to migrant labour as well as spreading the overhead costs per employee more evenly over the year. Finally, diversity in agricultural production and value added products can increase income-generating opportunities and spread the risks of failure over a wider range of crops and products.

ANNEX 2. THE WORLD OF ORGANIC AGRICULTURE

Key World Indicators

Indicator	World	Leading countries
Countries with data on certified organic agriculture[1]	2012: 164 countries	
Organic agricultural land	2012: 37.5 million hectares (1999: 11 million hectares)	Australia (12 mio. hectares, 2009) Argentina (3.6 mio. hectares) US (2.2 mio. hectares, 2011)
Share of total agricultural land	2012: 0.87 %[2]	Falkland Islands (Malvinas) (36.3 %) Liechtenstein (29.6 %) Austria (19.7 %)
Further, non-agricultural organic areas (mainly wild collection)	2012: 31 million hectares (2011: 32.5 million hectares; 2010: 43 million hectares)	Finland (7 million hectares) Zambia (6.1 million hectares; 2009) India (4.7 million hectares)
Producers	2012: 1.9 million producers (2011: 1.8 million producers; 2010: 1.6 million producers)	India (600'000), Uganda (189'610), Mexico (169'707)
Organic market size	2012: 63.8 billion US dollars (approx. 50 billion euros) (1999: 15.2 billion US dollars) Source: Organic Monitor	US (22.6 billion euros), Germany (7 billion euros) France (4 billion euros)
Per capita consumption	2012: 9.08 US dollars[3]	Switzerland (189.1 euros), Denmark (158.6 euros) Luxemburg (143 euros)
Number of countries with organic regulations 2012	2012: 88 countries (2011: 86 countries)	

According to the latest FiBL-IFOAM survey on certified organic agriculture worldwide, as of the end of 2012, there were 37.5 million hectares of organic agriculture land, including in-conversion areas. The regions with the largest areas of organic agricultural land are Oceania (12,2 million hectares, 32% of the world's organic agricultural land), Europe (11.2 million hectares, 30%) and Latin America (6.8 million hectares, 18%).

Table 9: World organic agricultural land (including in-conversion areas) and shares of total agricultural land in 2012

Continent	Organic agricultural land (thou. ha)	Share of total agricultural land
Africa	1.145	0.1%
Asia	3.217	0.2%
Europe	11.171	2.3%
Latin America	6.836	1.1%
Northern America	3.012	0.7%
Oceania	12.164	2.9%
Total	**37.544**	**0.9%**

Source: FiBL-IFOAM. The World of Organic Agriculture, Statistics and Emerging Trends, 2014

Currently, 0.9% of the agricultural land of the 164 countries covered by the survey is organic. By region, the highest shares of the total agricultural land are in Oceania (2.9%) and in Europe (2.3%). In the European Union, 5.6% of the farmland is organic.

Almost two-thirds of the organic agricultural land was grassland/grazing areas (22.5 million hectares). With a total of 7.5 million hectares, arable land constitutes almost 20% of the organic agricultural land. Most of this category of land is used for cereals, including rice (3.1 million hectares), followed by green fodder from arable land (2.3 million hectares), oilseeds (0.6 million hectares), protein crops (0.3 million hectares), and vegetables (0.2 million hectares).

Permanent crops account for 3.2 million hectares, or 7% of the organic agricultural land. The most important permanent crops are coffee (0.7 million hectares), followed by olives (0.6 million hectares), nuts and grapes (0.3 million hectares each), and cocoa (0.2 million hectares).

Most of the wild collection area (including areas for beekeeping) is in Europe and Africa. Berries, medicinal and aromatic plants, and fruit are among the most important crop for this category of land.

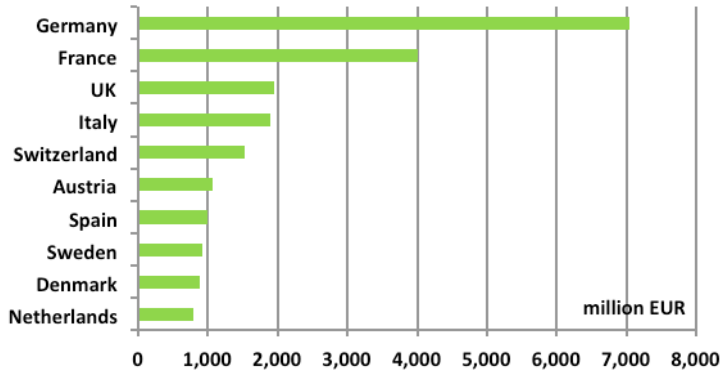
Latest research from Organic Monitor finds international sales of organic food and drink approached 64 billion USD in 2012. Growth is occurring in all regions; however, demand for organic products is mainly in North America and Europe. Organic product sales are projected to continue to rise in the coming years.

In 2012, the countries with the largest organic markets were USA, Germany and France. The highest per-capita consumption was in Switzerland, Denmark, and Luxembourg. The highest market shares were reached in Denmark, Switzerland, and Austria.

The Organic Market in Europe

According to data provided by the EU-funded project OrganicDataNetwork, the organic market in Europe amounts to 22.8 billion euros (European Union: 20.9 billion euros). Germany, the largest market in Europe, had retail sales of 7.0 billion euros, followed by France (4.0 billion euros), UK (2.0 billion euros) and Italy (1.9 billion euros).

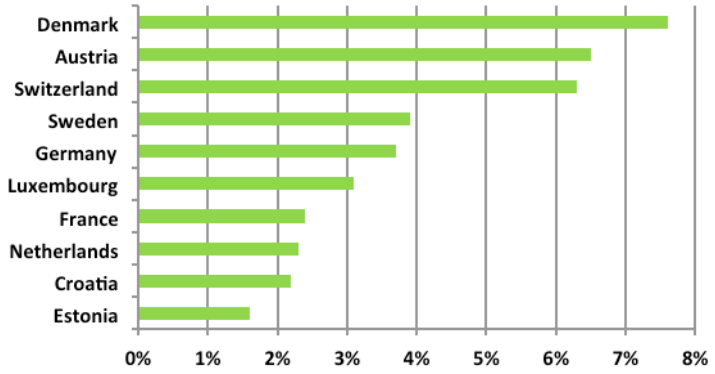
Figure 10: The ten European countries with the largest markets for organic food and beverages in 2012



Source: FiBL-IFOAM. The World of Organic Agriculture, Statistics and Emerging Trends, 2014

The highest market shares of organic foods in total food consumption were reached in Denmark (7.6%), Austria (6.5%), and Switzerland (6.3%).

Figure 11: The ten European countries with the highest organic market shares in 2012



Source: FiBL-IFOAM. The World of Organic Agriculture, Statistics and Emerging Trends, 2014

The highest per-capita consumption of organic food in 2012 was in Switzerland (189 euros), Denmark (159 euros), and Luxembourg (143 euros).

Figure 12: The ten European countries with the highest per-capita consumption of organic food and beverages in 2012

Source: FiBL-IFOAM. The World of Organic Agriculture, Statistics and Emerging Trends, 2014

Within the overall organic market in Europe, certain organic products are more dominant than others. Fruit and vegetables are pioneering organic products in Europe. They now have shares of between one third and one fifth of many national organic markets. They are especially strong in Italy, Ireland, Norway, Sweden and Germany.

In many countries and in Northern Europe in particular animal products, especially milk and dairy products, make up a high share of all organic products sold. Meat and meat products are very successful, with market shares of around 10% in Belgium, the Netherlands, Finland and France. On the other hand, in many countries, the meat and meat-based product market is not yet developed, due to lack of manufacturing capacities and high price premiums compared to conventional products.

Figure 13: Product shares of the UK organic market

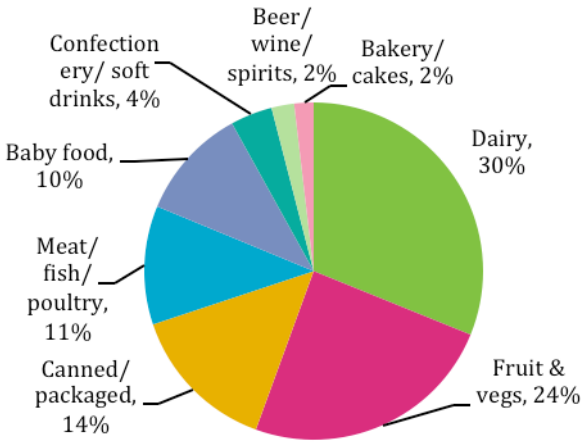


Figure 14: Sales channels of the UK organic market

Source: Soil Association, UK Organic Market Report, 2014
Note: Multiple retail sales only

Beverages, mainly wine, constitute an important part of the organic markets – nearly 15% in France and Croatia. Hot beverages (coffee, tea, and cocoa) make up 3 to 5% of the organic market. Milled cereal products, which are easily sold and stored in supermarkets, achieve high shares in the Czech Republic, Finland and Norway. Bread and bakery products are very important in the organic product range, with around 10% of the market, in Switzerland, the Netherlands, France, Sweden, Finland, and Germany.

When comparing the market shares of organic products within the total market one of the success stories in many European countries are eggs. According to the OrganicDataNetwork survey, organic eggs have market shares of up to 20% in Switzerland, and around 10% in most of the countries for

which data was available. Sales of eggs reflect the high concerns of consumers with regards to animal welfare and also their readiness to pay relatively high preice premiums. In Germany, for example, organic eggs are at least double the price of conventional eggs – one of the highest price differentials to be found within organic product groups.

- After eggs, vegetables enjoy the highest market shares (in value), with organic accounting for 8-12% of all vegetables sold in Switzerland, Austria, and Germany;
- In many countries, organic dairy products achieve market shares of about 5% of all dairy products sold. In Switzerland, the figure is even higher – 10%;
- Single products, such as organic baby food and meat substitutes, often achieve high shares of the total market in many European countries. Fresh carrots, for example, have a 30% market share in Germany;
- On the other hand, products like beverages and meat (especially poultry) generally have low market shares due to high price premiums compared to conventional products.

The organic consumer (UK case study)

According to data compiled by the Soil Association, in UK four out of five households buy organic products (80.3%). More than half of shoppers (55%) say they believe it is important to do so, while only 6% think shopping organic is 'not at all important'.

Organic consumers are much more interested in food quality, provenance and buying local than the average shopper. In-depth research suggests that organic consumer motivations can be grouped together into four broad and sometimes overlapping areas of motivation:

1. Living healthily;
2. Being a global citizen (or 'doing the right thing' from an ethical perspective);
3. Preferring 'real food' (predominantly meaning natural and unprocessed);
4. Seeking out quality (some choose organic options for treats or 'special occasion' cooking).

More than three-quarters of households buy organic products but sales are dominated by a small core of committed shoppers. A third of organic shoppers (33%) account for well over three-quarters of spending (85%), while just 6% of shoppers are responsible for half of all sales (51%). The most committed buyers are aged 28-44: this is the age bracket where organic products attract the highest spend compared to the national average for all age groups.

Figure 15: Top reasons for buying organic

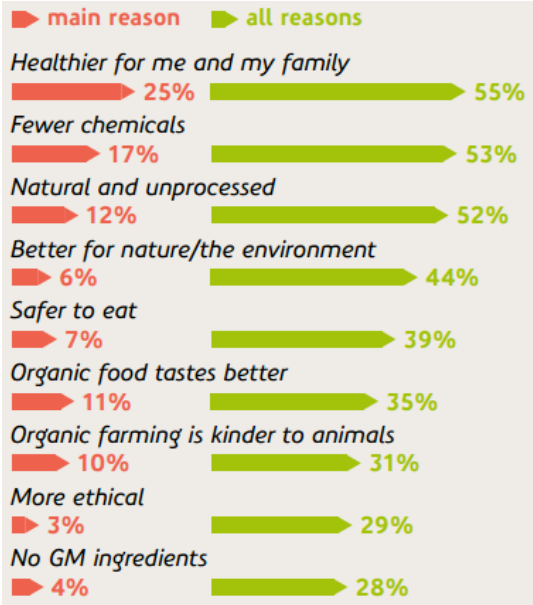
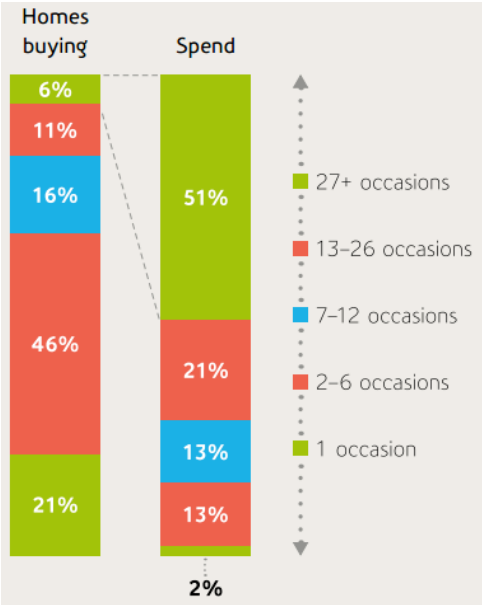


Figure 16: Spending frequency of organic buyers



Imports (Germany case study)

Germany is not only the largest market for organic products in Europe but also one of its largest organic producers. In spite of this fact, Germany imports, depending on the product, 2 to 95% of such organic products which could also have been produced in the country.

Cereals

The import share of organic cereals is 15%, and could go higher in years if bad weather. Wheat has the highest import share of 21%. The import share varies according to quantity, quality, and price level of the German harvest; however, there is a large potential for an increase of production in Eastern European countries (Romania, Russia, Ukraine, and Slovakia).

Protein crops

For protein crops, the import share is 24%. These imports will become even higher once the legal requirement of 100% organic feed has been implemented. In this context, soybeans, usually classified as oilseeds, are important. They account for 76% of all organic oil seed imports. The cultivation of this crop, even though feasible in Germany, is not easy. There is clear potential for further expansion.

Fodder crops

The availability of fodder crops has an effect on pig and poultry production, which entails high costs for fodder and investments, even though the demand for organic pork can by far not be met.

Potatoes

Organic fresh potatoes are, by volume, among the most important organic fresh products, after organic eggs and organic fresh vegetables. They held a market share of 4.7% in 2010. In 2009, the import share was 28%. It will probably remain at that level, as the organic area expanded considerably already at the end of the 1990s and retailers prefer to offer imported potatoes in the early potato season.

Vegetables

As regards vegetables, organic carrots are by far the most sold product and are grown on 14% of the carrot area in Germany. As the individual farms cannot expand the areas cultivated with carrots,

Germany imports 48% of its organic carrots. In order to increase German production, additional producers would need to use additional small areas. The high import rates of fruit vegetables such as tomatoes (80%) and peppers (90%) are due to the all year round demand for products that can only be grown in season in Germany. As regards vegetables from protected cropping, the demand for local produce is high, so that an increase of imported volumes is limited.

Fruit

Organic bananas and apples are the best-sold organic fruit products. Organic bananas have, naturally, an import rate of 100%. The import rate for organic apples was also high at 50% in 2009/2010. However, during that time the organic apple area in Germany expanded to 3'000 hectares and now constitutes 9% of the apple area in Germany. Therefore, it can be expected that, under the right weather conditions, German production will increase and the import share will decrease.

Dairy products

Germany imports 26% of its fresh organic milk and 26% of its organic butter, most of it coming from Denmark and Austria. The import share for cheese is probably in a similar range. Other products such as yoghurt and cream originate from Germany—at a rate of almost 100%. 16% of milk is imported when calculated in milk volumes (without consideration of the cheese imports).

Main supplying countries

For Germany, the biggest suppliers of organic cereals are Italy, Russia, Kazakhstan, Romania, and Slovakia. Regarding protein crops (fodder peas, field beans, lupines), Lithuania plays by far the most prominent role, with almost half of the imports coming from there. For oilseeds including soybeans, Romania and Italy are the most important suppliers. However, several countries outside Europe (Kazakhstan, Argentina, India, and Brazil) are beginning to play an increasingly important role for soybean imports. Potatoes are mainly imported from Israel, Egypt, and Austria. The Netherlands are an important supplier of carrots, onions, eggs, and pork. Fruit vegetables mainly come from Spain and Italy. Israel supplies larger quantities of potatoes, tomatoes, and peppers. Italy supplies one third of the apples sold in Germany. The bananas imported are mainly from the Dominican Republic, Ecuador, and Costa Rica.

Table 10: Germany: imports, production, and import share, 2009/10 season

Product	Imports	Production	Import share	Key suppliers
Cereals	***114,000***	***667,000***	***15***	
Wheat	70,000	185,000	27	Italy, Kazakhstan, Romania, Hungary, Russia, Slovakia, Ukraine
Maize	18,000	25,000	42	Romania, Italy, Slovakia, Hungary
Spelt	10,000	80,000	11	Italy, Slovakia, Hungary
Rye	8,000	200,000	4	Lithuania, Austria, Latvia, Russia
Barley	11,300	89,000	11	Russia
Rice	3,500	-	100	Italy, India, Pakistan
Oats	1,600	82,000	2	Finland, Denmark, Sweden
Protein crops	***14,600***	***45,000***	***24***	
Field beans	2,400	14,300	14	Lithuania, Romania
Field peas	10,000	16,400	38	Lithuania, Russia, Slovakia
Lupines	1,000	13,700	7	Lithuania, Poland
Lentils	340	-	100	Canada, Turkey

Product	Imports	Production	Import share	Key suppliers
Oil seeds	***41,640***	***13,000***	***76***	
Soy beans	19,000	1,400	93	Italy, Romania, Kazakhstan, India, Argentina, Brazil
Sunflower kernels	11,000	2,050	84	Romania, Brazil, Argentina, China
Linseed	5,200	300	95	Canada, Argentina, China, Russia
Sesame	640	-	100	Egypt, Uganda
Rape seed	5,000	10,000	33	Romania, Russia, Kazakhstan, Hungary
Potatoes	***38,000***	***100,000***	***28***	***Austria, Israel, Egypt, Netherlands***
Vegetables				
Carrots	47,000	50,000	48	Netherlands, Israel, Italy
Tomatoes	18,000	4,000	82	Spain, Netherlands, Italy, Israel
Sweet peppers	5,900	600	91	Spain, Israel, Netherlands
Onions	4,500	8,500	35	Netherlands, Argentina, Egypt
Cucumbers	4,600	4,500	51	Spain, Netherlands, Bulgaria
Strawberries	***1,100***	***2,280***	***33***	***Spain, Italy***
Fruit				
Apples	26,000	26,000	50	Italy, Austria, Argentina, New Zeeland
Bananas	72,000	-	100	Columbia, Ecuador, Dom. Rep.
Pork	***7,000***	***24,400***	***22***	***Netherlands, Austria, Denmark, Italy***
Sugar	***2,500***	***49,000***	***5***	***Brazil, Paraguay, Ecuador***
Eggs (mio. pieces)	***97***	***383***	***20***	***Netherlands, Italy***
Milk	***97,000***	***545,500***	***15***	***Denmark, Austria***

Source: AMI/FiBL, Importe von Bio-Produkten nach Deutschland ermittelt (http://www.bioimporte.de/de/pressemitteilungen/mitteilung-vom-30112011.html)

In many of the above-mentioned countries, areas are under conversion, and thus further products can be expected for the international market from there. Already now, Germany is relying on these imports, in particular for products that can be produced here only with difficulties or that can only be seasonally produced. For many livestock products such as eggs, milk, and pork, German consumption is currently higher than production. If enough and cheaper feedstuffs were available, there would be significant potential for these products. Indeed, data for the last marketing season shows an increase of German organic imports from Ukraine and Romania.

ANNEX 3: GLOBAL REGULATORY AND TRADE ENVIRONMENT FOR ORGANIC AGRICULTURE

Organic Standards

Based on the definition and principles of organic agriculture, there was a need to establish what organic farming systems meant in practice. Consequently, standards were required to ensure that organic production and processing systems uphold the definition of organic farming. Organic standards detail the minimum requirements of the farming system in order to ensure that the definition of organic farming is upheld.

In 1967 Soil Association published the first standards for organic agriculture, primarily as a means of protecting the consumer and the genuine organic farmer from bogus claims. Farmers were invited to register their farms with the Soil Association and sign a declaration that they would abide by these guidelines. On-site inspection to verify that farmers met the standards did not commence until the mid-1970s, and with this, the first organic seals were born. At the time the market for organic food was small, and the Government took no interest in what constituted an organic product.

INFOBOX: Main definitions associated with certification

- *Accreditation* - The procedure by which an authoritative body gives formal recognition that a body or person is competent to carry out specific tasks. In a certification system, an accreditation body will accredit, or approve, a certification body as competent to carry out certification.
- *Certification Body* - A body that is responsible for verifying that a product sold or labelled as a certified product is produced, processed, prepared, handled, and traded according to the certification standards. Certification bodies should be impartial third parties with necessary technical competence in certification.
- *Certification* - A procedure through which recognised (or accredited) certification bodies provide written or equivalent assurance that a product conforms to certain principles, criteria or standards.

In 1972 a non-governmental international organization International Federation of Organic Agricultural Movements (IFOAM) was established. In 1980 IFOAM published its first standards that are essential for creation of state standards and inspection systems.

In the USA the first laws on organic farming were issued in Oregon (in 1974) and California (in 1979). In 1990 the USA issued the Organic Food Production Act, however, all the requirements of organic agriculture have come into force only in October 21, 2002 under the auspices of the US Department of Agriculture (USDA).

In European Union, Regulation 2092/91, covering the labelling of organic foods, was adopted in 1991. Although not the world's first such legislation (France, Spain, and Denmark already had legislation, as did some US states), it probably has had the most far-reaching consequences to date on the organic movement. This significant impact has resulted from the combined effect of it being the first regional, statutory definition and the fact that EU represents one of the largest markets for organic produce. Businesses, both inside and outside Europe, had to comply if they wanted to sell within or into the European market.

In many countries in the EU, private organisations had already formulated their own standards and labelling schemes prior to the implementation of national regulations. These standards were mostly

guiding principles rather than detailed production and processing standards but were trusted by many consumers. The implementation of national regulations forced private standards to comply with them.

Current EU organic legislation

In June 2007 the European Council of Agricultural Ministers agreed on a new *Council Regulation on organic production and labelling of organic products*. This Council Regulation contains defined goals, principles and general rules for organic production.

The goal of this new legal framework was to set a new course for the continued development of organic farming. Sustainable cultivation systems and a variety of high-quality products are the aim. In this process, even greater emphasis is placed on environmental protection, biodiversity and high standards of animal protection. In addition, the legislation aims at ensuring consumer confidence and protecting consumers' interests.

Foods may only be marked as "organic" if at least 95% of their agricultural ingredients are organic. Organic ingredients in non-organic food may be listed as organic in the list of ingredients, as long as this ingredient has been produced in accordance with the organic legislation. In order to ensure better transparency, the code number of the control body must be indicated.

According to the EU legislation, producers of packaged organic food must use the EU organic logo (as of 1 July 2010). The use of the logo on organic foods from third countries, however, is optional. When the EU organic logo is used, the place of production of the agricultural ingredients must be indicated.

Imports from third countries

Organic products from third countries may only be placed on the EU market when they are labelled as products with indications referring to organic production, if they have been produced in accordance with production rules and subject to inspection arrangements that are in compliance with, or equivalent to Community legislation.

Imports into the EU are allowed according to the following schemes established by Commission Regulation (EC) No 1235/2008:

- *Country Authorisation*
  In order to ascertain that goods have been obtained according to production rules equivalent to those laid down in the Community, the European Commission makes a thorough investigation into the arrangements in the country concerned, examining not only the requirements imposed on production but also the measures applied to ensure effective control. Where rules are found to be equivalent, the third country is included in the list of authorised countries, which currently includes Argentina, Australia, Canada, Costa Rica, India, Israel, Japan, Switzerland, Tunisia, USA, and New Zealand.
- *Control by recognised inspection body or recognised inspection authority*
  From 1 July 2012, the Commission has established a list of control authorities and control bodies competent to carry out inspections in countries not included in the list of recognised third countries. The function of these authorities and bodies is to guarantee that products have been produced in compliance with Community production rules, or are equivalent to Community legislation.
  Imports of organic products can only take place if these recognised authorities or bodies have controlled them.
- *Authorisations to importers on a case by case basis*

In order not to disrupt international trade, and to facilitate the transition between the rules established by Regulation (EEC) No 2092/91 and those established by Council Regulation (EC) No 834/2007, a transitional system was applicable.
From January 1, 2009 and up to July 1, 2014, the EU Member States were allowed to continue to grant import authorisations for consignments from third countries not included in the above mentioned list. Importers had to prove that products were obtained according to production rules equivalent to those laid down by Community legislation and were subject to inspection measures. The EU Member State had to notify the European Commission and the other Member States the list of products for which it has issued an authorisation.

ANNEX 4. BEST PRACTICES IN PUBLIC SECTOR SUPPORT FOR GREENING THE AGRICULTURE

Best Practices in Greening the Agriculture in the European Union

Cross-compliance

Cross-compliance is a mechanism that links direct payments to compliance by farmers with basic standards concerning the environment, food safety, animal and plant health and animal welfare, as well as the requirement of maintaining land in good agricultural and environmental condition. Since 2005, all farmers receiving direct payments are subject to compulsory cross-compliance.

Cross-compliance includes two elements:

- Statutory Management Requirements: These requirements refer to 18 legislative standards in the field of the environment, food safety, animal and plant health and animal welfare:
- Good agricultural and environmental condition: The obligation of keeping land in good agricultural and environmental condition refers to a range of standards related to soil protection, maintenance of soil organic matter and structure, avoiding the deterioration of habitats, and water management.

Table 11: Statutory Management Requirements for EU cross-compliance mechanism

SMR1 - Conservation of Wild Birds	SMR11 - Food Hygiene
SMR2 - Protection of Groundwater	SMR12 - Feed
SMR3 - Sludge	SMR13 - Foot and Mouth
SMR4 - Nitrates	SMR14 - Swine Vesicular Disease
SMR5 - Conservation of Natural Habitats and of Wild Flora and Fauna	SMR15 - Bluetongue
SMR6, 7, 8 & 8a - Identification and Registration of Animals (Bovine, Ovine, Porcine)	SMR16 - Animal Welfare (Calves)
SMR9 - Plant Protection Products (Pesticides)	SMR17 - Animal Welfare (Pigs)
SMR10 - Hormones	SMR18 - Animal Welfare (General)

Source: Council Regulation (EC) No 73/2009 of 19 January 2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers

Cross-compliance represents the "baseline" or "reference level" for agri-environment measures. For all requirements falling under cross-compliance, the ***compliance costs have to be born by farmers*** ("Polluter-Pays-Principle"). The cross-compliance mechanism penalises farmers who infringe EU law on environmental, public and animal health, animal welfare or land management by reducing the EU support they receive. The size of the reduction depends on the severity of the infringement. In case of negligence, the percentage of reduction shall not exceed 5% and, in case of repeated non-compliance, 15%. In case of intentional non-compliance, the percentage of reduction shall not be less than 20% and may go as far as total exclusion from one or several aid schemes and apply for one or more calendar years.

Cross-compliance is an important tool for integrating environmental requirements into the Common Agricultural Policy. Cross-compliance ensures that support granted under the Common Agricultural Policy contributes to promoting sustainable agriculture and, thereby, responds positively to concerns of citizens at large.

Table 12: Cross-Compliance - Statutory Management Requirements applicable for Scotland

Ref. No.	EC Directive / Regulation	What will be the Cross Compliance requirement to be met by the farmer?

Ref. No.	EC Directive / Regulation	What will be the Cross Compliance requirement to be met by the farmer?
1	Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds	Article 3 requires Member States to take action to secure or re-establish habitats for all naturally occurring wild birds Article 4 requires Member States to take special protection measures for certain species of bird, including the establishment of Special Protection Areas (SPAs). Appropriate steps have to be taken to avoid pollution or deterioration of habitats or disturbance of birds on these sites. There is a similar requirement for habitats outside protected sites. Article 5 prohibits the deliberate killing and significant disturbance of wild birds, deliberate destruction of, or damage to, their nests and eggs, removal of their nests or taking of their eggs except under licensed conditions e.g. for protection of crops. Article 7 permits hunting of wild birds subject to conditions. Article 8 prohibits certain means of killing wild birds. This Directive is principally of relevance to farmers in the following circumstances: - action which breaches article 4 (protection of SPAs and other habitats of birds elsewhere in the countryside) may lead to cross-compliance penalties. In particular, a farmer may be liable to penalty if he carries out, without consent, an operation which Scottish Natural Heritage has informed him he needs their consent for. - killing or significant disturbance of birds, or damage to nests and eggs, contrary to the Wildlife and Countryside Act 1981 and subsequent legislation on the protection of birds.
2	Council Directive 80/68/EEC of 17 December 1979 on the protection of groundwater against pollution caused by certain dangerous substances	Under the Groundwater Regulations 1998 land managers require an Authorisation from SEPA before disposing of List I and List II substances to land. The major consequence of this is that farmers require authorisation for disposal of spent sheep dip and pesticide washings to land. Where List I and List II substances are otherwise used, manufactured, stored or handled farmers will be expected to comply with relevant legislation, codes of practice or other relevant good practice. Where it is necessary for the protection of groundwater, SEPA will serve a Notice that requires the activity to comply with certain conditions, or, where the risks cannot be controlled, SEPA may prohibit the activity altogether. The Sheep Dipping Code of Practice may be cited in a Notice served by SEPA..
3	Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture	Use only of sludge treated in accordance with the Directive. Observation of specified harvesting intervals and other requirements to prevent contaminants (e.g. heavy metals) reaching the human food chain. Farmers in NVZs will be expected to record the use of sludge in their Fertiliser and Manure Plan and to observe the relevant closed period, as necessary. Scottish Water, as the principal sludge producer in Scotland, is required to comply with the Sludge (Use in Agriculture) Regulations 1989. Normally, the treatment of agricultural land with sewage sludge will be supported by professional advice as to the nutrients supplied, timing and method of application etc. SEPA audits the sludge registers held by Scottish Water.
4	Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources	Farmers with land in NVZs should comply with the mandatory measures contained in the Nitrogen and Phosphorus Supplement to the PEPFAA Code in addition to adhering to the Action Programme measures. The measures are set out in the Action Programme for Nitrate Vulnerable Zones (Scotland) Regulations 2003 (SSI 2003/51).

Ref. No.	EC Directive / Regulation	What will be the Cross Compliance requirement to be met by the farmer?
5	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna	Article 6 requires (i) Special Areas of Conservation (SACs) to be designated for habitats (listed in Annex I) and species (listed in Annex II) to be protected from damage, deterioration of habitats or disturbance of species; and (ii) the effects of plans or projects that could cause adverse effects to be considered. Article 13 requires prohibition of destroying, cutting or uprooting of protected plant species listed in Annex IV(a) of the Directive. Article 15 requires prohibition of certain methods of killing or taking wild species. Article 22 requires regulation of introduction of non-native species where prejudicial to native wildlife. This Directive is principally of relevance to farmers in the following circumstances: - action which breaches article 6 (protection of SACs) may lead to Cross Compliance penalties. In particular, a farmer may be liable to penalty if he carries out, without consent, an operation which Scottish Natural Heritage has informed him he needs their consent for. - deliberate killing or disturbing of protected animal species, including activities deleterious to their breeding sites or resting places. - destruction, cutting or uprooting of protected plant species, use of prohibited methods of killing or taking wild species or evidence of non-compliance with measures designed to regulate introduction of non-native species.
6	Council Directive 92/102/EEC of 27 November 1992 on identification and registration of animals	Farmers are required to comply in full with the domestic legislation which implements EU requirements governing the, record keeping, and movement requirements for cattle, sheep, goats and pigs. The domestic legislation currently in force is : The Sheep and Goats Identification (Scotland) Regulations 2000 The Cattle Database Regulations 1998 The Cattle Identification Regulations 1998 The Pigs (Record, Identification and Movement Order 1995 The Bovine Animals (Identification, Marking and Breeding Records) (Amendment) Order 1993 The Cattle Identification (Amendment Regulations 1998 The Cattle Identification (Notification of Movement) (Scotland) Amendment Regulations 2002 The Cattle (Identification of Older Animals) (Scotland) Regulations 2000
7	Commission Regulation 2629/97 of 29 December 1997 laying down detailed rules for the implementation of Council Regulation 820/97 as regards eartags, holding registers and passports in the framework of the system for the identification and registration of bovine animals	Farmers are required to comply in full with the domestic legislation which implements EU requirements governing the identification, record keeping, and movement requirements for cattle, sheep, goats and pigs. The domestic legislation currently in force is : The Sheep and Goats Identification (Scotland) Regulations 2000 (SSI 2000/418) as amended. The Cattle Database Regulations 1998 (SI 1998/1796) The Cattle Identification Regulations 1998 (SI 1998/871) as amended The Pigs (Record , Identification and Movement Order 1995 (SI 1995/11) The Bovine Animals (Identification, Marking and Breeding Records) (Amendment) Order 1993 (SI 1993/503) The Cattle Identification (Amendment Regulations 1998 (SI 1998/2969) The Cattle Identification (Notification of Movement) (Scotland) Amendment Regulations 2002 (SSI 2002/22) The Cattle (Identification of Older Animals) (Scotland) Regulations 2000 (SSI 2001/1)

Ref. No.	EC Directive / Regulation	What will be the Cross Compliance requirement to be met by the farmer?
8	Regulation 1760/2000 of the European Parliament and of the Council of 17 July 2000 establishing a system for the identification and registration of bovine animals and regarding the labelling of beef and beef products	Farmers are required to comply in full with the domestic legislation which implements EU requirements governing the identification, record keeping, and movement requirements for cattle, sheep, goats and pigs. The domestic legislation currently in force is: The Sheep and Goats Identification (Scotland) Regulations 2000 The Cattle Database Regulations 1998 The Cattle Identification Regulations 1998 The Pigs (Record , Identification and Movement Order 1995 The Bovine Animals (Identification, Marking and Breeding Records) (Amendment) Order 1993 The Cattle Identification (Amendment Regulations 1998 The Cattle Identification (Notification of Movement) (Scotland) Amendment Regulations 2002 The Cattle (Identification of Older Animals) (Scotland) Regulations 2000
9	Council Directive 91/414/EEC of 15 July 1991 concerning the placing of plant protection products on the market	1. That the farmer has not retained products that are no longer approved for use. 2. That the farmer is carrying out spray operations on approved crops only, following the Green Code using the pesticide at the correct dosage levels and leaving sufficient 'buffer zones' so that the spray does not enter water courses. Plant Protection Products (Scotland) Regulations 2003 (SSI 2003/579) refer.
10	Council Directive 96/22/EC of 29 April 1996 concerning the prohibition on the use in stockfarming of certain substances having a hormonal or thyrostaic action and of beta-agonists	No illegal use of substances having a hormonal, thyrostatic action, or the use of beta agonists. Where confirmed residues of banned substances are found following MHS inspection the SVS will carry out an on-farm investigation, including taking extra samples.
11	Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety	(i) Ensure that the food and feed safety requirements, specified in Articles 14 and 15 of Regulation 178/2002, are met. (ii) Ensure that all stages of production, processing and distribution within the businesses under their control, satisfy the food and feed safety requirements of food law which are relevant to those activities, and verify that such requirements are met (Article 17). (iii) Maintain traceability systems (Article 18). (iv) Withdraw and/or recall food or feed from the market if this is not in compliance with food or feed safety requirements, and notify competent authorities (Articles 19/20).
12	Regulation (EC) 999/2001 of the European Parliament and of the Council of 28 January 2002 laying down rules for the prevention, control and eradication transmissible spongiform encephalopathies.	Article 7: The farmer must not feed to ruminants protein derived from mammals or feed any products of animal origin to farmed animals, in accordance with Annex IV. Further, the farmer must not export or store feed intended for farmed animals which contains protein derived from mammals or feed intended for mammals, except for the feeding to dogs and cats. Article 11: The farmer must immediately notify the DVM of any animal suspected of being infected by a TSE. Articles 12, 13: Once notification of a TSE suspect is made, the farmer must fully comply with movement restrictions or any other notices served on that animal or animals by an inspector under these articles. Article 15: This Article moves away from the individual farmer by largely focusing toward the trade aspects of the industry. However, should the farmer have in his possession a TSE suspect animal(s) which is already covered in Articles 12 and 13, he must remain in full compliance of any movement restrictions.
13	Council Directive 85/511/EEC of 18 November 1985 introducing Community measures for the control of foot-and-mouth disease	As implemented in the UK by the Foot-and-Mouth Disease Order 1983 (S.I. 1983/1950), as amended; requires any person who has in his possession or under his charge an affected or suspected animal or carcass to notify the fact to the authorities.

Ref. No.	EC Directive / Regulation	What will be the Cross Compliance requirement to be met by the farmer?
14	Council Directive 92/119/EEC of 17 December 1992 introducing general Community measures for the Control of certain animal diseases and specific measures relating to swine vesicular disease	The notification provisions of this Directive are implemented in the UK via the Specified Diseases (Notification) Order 1996, as amended, which requires a person who has in his possession or under his charge an animal or carcase which he knows or reasonably suspects is infected to notify the authorities. There is a similar requirement in respect of swine vesicular disease in the Swine Vesicular Disease Order 1972.
15	Council Directive 2000/75/EC of 20 November 2000 laying down specific provisions for the control and eradication of bluetongue	As implemented in by the Bluetongue (Scotland) Order 2003, requires any person who knows or suspects that an animal or carcass in his possession or under his charge is diseased to notify the authorities.
16	Council Directive 91/629/EEC of 19 November 1991 laying down minimum standards for the protection of calves	The Welfare of Farmed Animals (Scotland) Regulations 2000, as amended. The Code of Recommendations for the Welfare of Cattle contains a section on calf rearing. Failure to comply with the Regulations and Code may lead to loss of subsidy.
17	Council Directive 91/630/EEC of 19 November 1991 laying down minimum standards for the protection of pigs	The Welfare of Farmed Animals (Scotland) Regulations 2000, as amended. The Code of Recommendations for the Welfare of Pigs. Failure to comply with the Regulations and Code may lead to loss of subsidy
18	Council Directive 98/58/EC of 20 July 1998 concerning the protection of animals kept for farming purposes	The Welfare of Farmed Animals (Scotland) Regulations 2000, as amended. Failure to comply with the Regulations and Code may lead to loss of subsidy.

Table 13: Cross-compliance - Good Agricultural and Environmental Condition (the Scottish Framework)

Issue	Standard	Measure	Guideline
Soil Erosion: Protect soil through appropriate measures.	Minimum soil cover.	1) All land that has carried a combinable crop must, over the following winter, have either: crop cover, grass cover, ploughed surface or a roughly cultivated surface. All other cultivated land should be treated similarly whenever soil conditions after harvest allow.	1) Under arable cropping, there are measures available to you to prevent soil erosion over the winter period. Options available in arable fields are having either: crop cover, stubble cover or land that has been ploughed or roughly cultivated. Fine seedbeds should only be created very close to sowing.
Soil Erosion: Protect soil through appropriate measures.	Minimum land management reflecting site-specific conditions.	2) In areas prone to wind erosion you must take steps to reduce the risk of soil loss in spring.	2) There are measures available to minimise soil erosion by the wind. These are - maintaining crop cover, using coarse seedbeds, shelter belts, nurse crops or mulches. You should undertake all or some of these measures if there is a risk of soil erosion by the wind.
Soil Erosion: Protect soil through appropriate measures.	Minimum land management reflecting site-specific conditions.	3) Use minimum cultivation techniques for sandlands. Sandlands are defined as light sandy soils.	3) There are measures available to reduce soil erosion on sandlands. For example using minimum cultivation techniques on the land by ploughing and rolling with the crop sown at right angles to the direction of the rolling.
Soil Erosion: Protect soil through appropriate measures.	Minimum land management reflecting site-specific conditions.	4) On sites where capping is a problem you must leave a rough seedbed or break any cap that forms or take other appropriate measures to avoid erosion.	4) On sown sites avoid capping. Fine seed beds can lead to the surface becoming sealed or capped. Options available to remediate this situation include reducing seedbed cultivation to produce a coarser tilth or by breaking the cap that forms. A capped surface is defined as: those conditions which occur particularly in sandy and silty soils when water infiltration is reduced to the point where there is observable run-off, the formation of rills and gullies and/or soil deposition at the sides of fields, on roads or in water courses and ditches.

Issue	Standard	Measure	Guideline
Soil Erosion: Protect soil through appropriate measures.	Minimum land management reflecting site-specific conditions.	5) Prevent land from becoming badly trampled or heavily poached by livestock (i.e. where there is no vegetative cover and/or in poached areas, where there is evidence of run off or standing water). Avoid overgrazing and heavy poaching of banks of watercourses, particularly watering points and feeding areas. This measure must be observed in conjunction with measure 14 (rotate feeding sites) and measure 16 (overgrazing). This measure does not apply to areas within the vicinity of gateways and farm tracks necessarily used during wet-periods. Otherwise applies to all grazing land.	5) In order to protect the land against soil erosion, prevent the land from becoming badly trampled or poached by livestock. If this occurs, remove stock until the land has recovered or you have undertaken remedial action. On peat soils this action will need to be taken earlier than on other soils due to the fragile nature and increased susceptibility of the soil to erosion. Any problems should be rectified by the next growing season after the period that the problem has occurred. High concentrations of stock often cause poaching, frequently as a result of supplementary feeding practices, with obvious damage to the vegetation. When supplementary feeding outdoors, it will often be preferable to rotate feeding sites and make sure feeding rings are suitably positioned i.e. well away from water courses and not on ground sloping towards a watercourse. Sacrificial feeding areas may be more desirable on improved grassland/arable land providing the risk of soil erosion is very low. Grazed forage cropped fields that have been poached should be ploughed or sown as ground conditions allow. Vicinity in this instance means approximately 10m.
Soil Erosion: Protect soil through appropriate measures.	Minimum land management reflecting site-specific conditions.	6) Maintain existing field drainage systems including clearing ditches, unless environmental gain is to be achieved by not maintaining field drainage systems. Use appropriate secondary treatment (moling or subsoiling) to maintain the efficiency of the system on suitable soils and to minimise run off. The vegetation from both sides of the ditch should not be removed in any one year.	6) In order to maintain soil health and to reduce erosion, maintain field drainage systems. There may be instances where environmental gain can be achieved by not maintaining some field drainage systems.
Soil Erosion: Protect soil through appropriate measures.	Minimum land management reflecting site-specific conditions.	7) On erodable (sandy and silty) soils establish tramlines across the main slope, where this cannot be done do not use any tramlines until the Spring unless compaction is broken for example with a tine behind the wheels.	7) To reduce soil erosion potential on these soil types, cultivate and drill on these fields across gentle slopes with simple slope patterns. On fields with steeper complex slopes, contour working can lead to a concentration of run off and an increased erosion risk. Such fields may be more appropriately used for permanent crops, such as permanent grass, than for arable cropping.

Issue	Standard	Measure	Guideline
Soil Erosion: Protect soil through appropriate measures.	Minimum land management reflecting site-specific conditions.	8) Follow Muirburn Code.	8) Avoid significant soil loss caused by inappropriate muirburn e.g. extensive erosion on steep sites through burning. Compliance with the Muirburn Code including guidance on the statutory controls on Muirburn will also avoid damage to property, wildlife, game, archaeology and extensive erosion on steep sites through burning.
Soil Organic Matter: Maintain soil organic matter levels through appropriate practices.	Standards for crop rotations where applicable.	9) Optimise the use of organic manures by basing rates of application on soil and crop needs.	9) Match spreading rate to nutrient requirement of the crop, the needs of the planned crop rotation and follow PEPFAA code do's and don'ts on the management and land application of livestock manures and organic by-products.
Soil Organic Matter: Maintain soil organic matter levels through appropriate practices.	Arable stubble management.	10) Follow Straw and Stubble Burning Code.	10) Ensure that straw and stubble burning is carried out in a controlled manner to avoid damage to the farm (e.g. buildings, crops and machinery), the countryside (e.g. hedges, trees and wildlife) and to avoid smoke drift onto nearby roads, homes and businesses.
Soil Organic Matter: Maintain soil organic matter levels through appropriate practices	Arable stubble management.	11) Incorporate Farm Yard Manure shortly after spreading on stubbles.	11) Match spreading rate to nutrient requirement of crop and follow PEPFAA code do's and don'ts on the management and land application of livestock wastes. Well timed applications of manure can help to increase top soil stability.
Soil Organic Matter: Maintain soil organic matter levels through appropriate practices.	Arable stubble management.	12) Incorporate straw evenly.	12) Ideally this should be chopped straw.
Soil Structure: Maintain soil structure through appropriate measures.	Appropriate machinery use.	13) Do not carry out any cultivations if water is standing on the surface or the soil is saturated.	13) By avoiding field cultivations in wet conditions erosion, compaction and rutting of the soil will be avoided. Minimise frequent vehicle movements over the same area of land, especially in poor conditions. Consider the use of low ground pressure tyres, dual wheels or tracked vehicles to minimise impact on soils. Saturation is indicated by the appearance of water when pressure is added e.g. from a footprint.
Soil Structure: Maintain soil structure through appropriate measures	Appropriate machinery use.	14) Rotate feeding sites where applicable. Observe this measure in conjunction with measure 5.	14) If an existing hard area is being used then that should be retained as a feeding site for livestock. However, if hard areas are not in supply then rotate the feeding site to avoid serious damage to the soil structure. Feeding sites must not be located on known ancient monument areas or adjacent to watercourses.

Issue	Standard	Measure	Guideline
Minimum level of maintenance: Ensure a minimum level of maintenance and avoid the deterioration of habitats.	Minimum livestock stocking rates or/and appropriate regimes.	15) Avoid undergrazing at a level where scrub or coarse vegetation is becoming evident and such changes are detrimental to the environmental or agricultural interest in the field.	15) Undergrazing may be identified as allowing the growth, quality or species composition of grazed vegetation to significantly deteriorate through lack of, or insufficient, grazing management. There may be circumstances where there is environmental gain to be made from allowing the encroachment of scrub and coarse vegetation. Where this occurs it will be a requirement that this intention is declared on the IACS return. If your stocking density decreases significantly then the land will be at a greater risk of undergrazing. In this circumstance you should take remedial action or seek professional advice. If you have declared to allow the encroachment of scrub and coarse vegetation and this leads to severe agricultural and environmental degradation then this will be investigated and action will be taken by SEERAD.
Minimum level of maintenance: Ensure a minimum level of maintenance and avoid the deterioration of habitats.	Minimum livestock stocking rates or/and appropriate regimes.	16) Avoid overgrazing with livestock and other species in such numbers as to adversely affect the growth, quality of species composition of vegetation other than vegetation normally grazed to destruction on that land to a significant degree e.g. land that is to be cultivated immediately after grazing by livestock which remove the entire crop. Cases of suspected overgrazing will be investigated. This measure must be observed in conjunction with measure 5.	16) The common conditions indicating overgrazing are: a) Clear evidence due to grazing pressure that the growth, quality or species composition of the vegetation is deteriorating to a measurable extent. Other indicators are: b) Evidence of poor condition of the vegetation combined with evidence of poor animal condition c) Sustained over-reliance on supplementary feed. Where overgrazing is identified, a management regime including a maximum (and where appropriate a minimum) stocking rate to be observed on that site will be prescribed by SEERAD. Failure to observe the stocking limit thereafter would be a breach of this measure. Where overgrazing is as a result of other species e.g. deer, geese and rabbits, which is beyond the control of the farmer then you will not be held accountable for this infringement where you have taken all reasonable measures to prevent overgrazing.

Issue	Standard	Measure	Guideline
Minimum level of maintenance: Ensure a minimum level of maintenance and avoid the deterioration of habitats.	Protection of permanent pasture.	17) Do not plough up permanent pasture except where this is part of normal rotational management of the land or where it is environmentally beneficial.	17) Permanent pasture is defined as land declared on the Area Aid Application (AAA) submitted in 2003 as permanent grass over 5 years, rough grazing and opened grazed woodland. Land managers may, however, plough up permanent pasture where this is part of normal rotational management of the land or where it is environmentally beneficial. Certain forms of permanent pasture are of high environmental or archaeological value e.g. species-rich grassland, machair habitats, pastoral woodland and heather moorland. Any proposal to plough up pasture of high environmental or archaeological value will normally require the consent of the relevant authority (e.g. SNH for pastoral land in SSSIs, SEERAD for land in an agri-environment agreement) or full Environmental Impact Assessment. Proposals to plough up semi-natural land such as rough grazings which has been in pastoral use for 12 years or more will normally require consent under the Environmental Impact Assessment and consideration of applications under these regulations will take account of the ecological value of the pasture land and of the environmental benefits or disbenefits of the proposed alternative use of the land.
Minimum level of maintenance: Ensure a minimum level of maintenance and avoid the deterioration of habitats.	Protection of permanent pasture.	18) To ensure the protection of rough grazings and other semi-natural areas land managers must not undertake new drainage works, ploughing, clearing, levelling, re-seeding or cultivating unless approved under the Environmental Impact Assessment	18) Ploughing, cultivating and re-seeding results in the natural vegetation being destroyed and replaced with sown grasses. New drainage works, and modification of existing drains, cause lowering of the water table which results in the loss of wetland plant communities and their associated fauna. In nearly all areas of deep peat, re-cutting moorland grips beyond what is needed for routine maintenance will also be considered as damaging and should not be carried out.
Minimum level of maintenance: Ensure a minimum level of maintenance and avoid the deterioration of habitats.	Protection of permanent pasture.	19) To ensure the protection of rough grazings and other semi-natural areas, pesticides, lime or fertiliser must not be applied except in certain cases or as approved under the Environmental Impact Assessment	19) Exceptions to measure 19 are allowed in the following circumstances. Herbicides may be applied to control spear thistle, creeping or field thistle, curled dock, broadleaved dock or ragwort and with the prior written approval of SEERAD for the control of other plants e.g. Japanese Knotweed and Giant Hogweed For the control of bracken with Asulam or other approved herbicides; or Exceptionally, the application of lime or fertiliser where no conservation damage will result e.g. holding fields adjacent to hill fanks.

Issue	Standard	Measure	Guideline
Minimum level of maintenance: Ensure a minimum level of maintenance and avoid the deterioration of habitats.	Retention of landscape features.	20) Take reasonable steps to avoid the deterioration of boundary features including drystane or flagstone dykes, turf and stone-faced banks, walls, hedges and hedgerow trees, boundary trees and field margins. No hedge trimming is permitted between 1 March and 31 July.	20) Land managers should take reasonable steps to avoid the deterioration of boundary features. Drystane or flagstone dykes or walls, hedges and hedgerow trees can only be removed with the prior written agreement of SEERAD or other appropriate Government agency. In part, this includes the avoidance of damaging activities without the prior written specific agreement of SEERAD or other appropriate Government agency. Such activities may include the use, storage or management of materials, machinery or livestock in ways which can reasonably be expected to cause deterioration of boundary features. Examples include: The use of machinery, including cultivations, the application of fertilisers or pesticides, or the storage of materials including livestock manures or straw or silage bales, on or within 1 metre of field margins or the bases of hedges or dykes. The demolition of or removal of material from walls, dykes and banks. The inappropriate or excessive trimming of hedges. The use of trees as straining posts.
Minimum level of maintenance: Ensure a minimum level of maintenance and avoid the deterioration of habitats.	Retention of landscape features.	21) Take reasonable steps to avoid the deterioration of non-productive landscape features which are part of the agricultural unit, such as shelter belts, copses and ponds.	21) As with boundary features, these features should be protected from damaging activities such as drainage or felling (except where this is the subject of specific consent by SEERAD or the appropriate regulatory authority, in particular the Forestry Commission for felling licences, and land managers should take reasonable positive action to prevent these features from deteriorating. Reasonable positive action to avoid deterioration includes: Maintenance of existing stockproof fences around shelter belts and copses. No feeding & other husbandry practices of livestock in copses and shelterbelts to avoid severe poaching. Management and application of livestock manures and organic by products in accordance with the PEPFAA Code so that ponds are protected from eutrophication.
Minimum level of maintenance: Ensure a minimum level of maintenance and avoid the deterioration of habitats.	Retention of landscape features.	22) Avoid damaging or destroying features or areas of known historic or archaeological interest.	22) As defined in the measures section. Follow Scottish Ministers' guidance for the protection of such features.

Issue	Standard	Measure	Guideline
Minimum level of maintenance: Ensure a minimum level of maintenance and avoid the deterioration of habitats.	Avoiding the encroachment of unwanted vegetation on agricultural land.	23) Avoid infestation by species which degrade the agricultural and environmental value of the land to the extent that there is substantial prejudice in the ability to use the land for agricultural purposes. Avoid severe encroachment of other species which degrade the agricultural capacity of the land, but allow encroachment which may be environmentally desirable as part of a mosaic of habitats.	23) Through appropriate grazing, topping or other permissible methods of control land managers should prevent the severe encroachment of species which are both agriculturally and environmentally degrading including rhododendron, bracken, weeds covered by the Weeds Act 1959, Japanese knotweed and giant hogweed. In some instances, encroachment of native species may be beneficial. For instance: this is likely to be the case in the following instances: Recolonisation of trees across the boundary line from native woodland. Recolonisation of scrub species such as gorse, birch and juniper as part of a mosaic of habitats. Reversion of land to wet grassland or wetland, with associated reversion to rushes. These patterns of ecological succession will be regarded as consistent with Good Agricultural and Environmental Condition provided that: They are consistent with maintaining the ecological status of protected areas (e.g. Sites of Special Scientific Interest). The area or field in question remains predominantly agriculturally utilisable. Recolonisation of native species which makes more than 25% of a field unutilisable for cropping or grazing may not be regarded as consistent with GAEC and should be the subject of specific agreement with SEERAD. In general, areas of trees inside an agricultural parcel with a density of more than 50 trees /ha should be considered as ineligible as forage area. Exceptions may be envisaged for tree classes of mixed cropping such as for orchards and for ecological/environmental reasons. The growth of scrub is easily reversible through regular cutting, use of permitted herbicides or grazing. Vigorous recolonising scrub may need to be cut every 5 to 10 years. Rush does not dominate to the extent that the land is no longer agriculturally viable.

Agri-environment measures

Agri-environment measures are a key element for the integration of environmental concerns into the Common Agricultural Policy. They are designed to encourage farmers to protect and enhance the environment on their farmland by paying them for the provision of environmental services.

Farmers commit themselves, for a minimum period of at least five years, to adopt environmentally-friendly farming techniques that go beyond legal obligations. In return, farmers receive payments that

provide compensation for additional costs and income foregone resulting from applying those environmentally friendly farming practices in line with the stipulations of agri-environment contracts.

Agri-environment measures play a crucial role for meeting society's demand for environmental outcomes provided by agriculture. Extensive farming systems, a mosaic of landscapes, environmentally sound farming techniques adapted to region-specific needs, or extensive pasture systems are highly valued. Agri-environment payments encourage farmers to adopt agricultural activities or levels of production intensity that deliver positive environmental outcomes, while not being necessarily the first choice from the point of view of profitability.

Examples of commitments covered by national/regional agri-environmental schemes are:

- environmentally favourable extensification of farming;
- management of low-intensity pasture systems;
- integrated farm management and organic agriculture;
- preservation of landscape and historical features such as hedgerows, ditches and woods;
- conservation of high-value habitats and their associated biodiversity.

Agri-environment measures may be designed at the national, regional, or local level so that they can be adapted to particular farming systems and specific environmental conditions. This makes agri-environment a targeted tool for achieving environmental goals.

Agri-environment measures are co-financed by Member States. EU expenditure on agri-environment measures amounts for 2007 - 2013 to nearly 20 billion EUR or 22% of the expenditure for rural development.

Agri-environment schemes were first introduced into EU agricultural policy during the late 1980s as an option to be applied by Member States. Since 1992, the application of agri-environment programmes has been compulsory for Member States in the framework of their rural development plans, whereas they remain optional for farmers.

Public support of organic farming in the European Union

For more than 20 years, European policies for organic farming have been developed on a number of levels. The first scheme specifically targeted at organic farming was introduced in Denmark in 1987, shortly followed by other countries. As part of the reform of the Common Agricultural Policy (CAP) in 1992, the introduction of agri-environment programmes provided a unified framework for supporting conversion to and maintenance of organic production across the EU. The rationale of this support was mainly based on the contribution of organic farming to two Community policy objectives: protection of the environment and reduction of production surpluses and therewith saving of public expenditures. Thus supporting organic farming was a means to an end and not a policy goal itself. Towards the end of the 1990s, however, the importance of organic farming in the context of the CAP shifted. Due to changing policy, economic and societal framework conditions, organic farming goals and CAP goals increasingly concurred. As a result, the expansion of organic farming has itself become a policy goal in several EU countries.

According to the European Community Strategic Guidelines for Rural Development, support for organic farming is seen as one option to achieve sustainable development. More specifically, EU Member States are encouraged to reinforce the contribution of organic farming to the environmental and animal welfare objectives of the CAP.

The main support measures can be classified as:

1. Refunding of certification and inspection costs related to organic farming;

2. Specific area payments to compensate additional costs or income foregone resulting from organic management;
3. Top-ups of the basic grants related to investments (such as modernisation of agricultural holdings, setting up of young farmers, etc.).

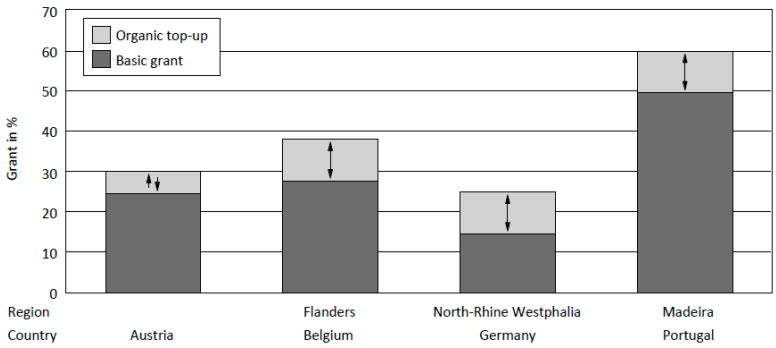
Refunding of certification and inspection costs related to organic farming

Regulation (EC) No. 834/2007 provides the legal basis for the certification of organic products. Only products certified according to this regulation can be labelled as "organic". Member States generally require farms to be certified as organic by accredited certification bodies to qualify for organic support payments. Various Member States use Measure 132 "Participation of farmers in food quality schemes" to cover up to 100 % of the certification and inspection cost incurred by farmers. The maximum contribution is EUR 3,000 per year and holding up to a maximum duration of 5 years.

For example in Austria, 60-80% of the organic inspection and certification costs (max. contribution EUR 700 per year) are reimbursed, while farmers participating in other food quality schemes receive compensation of 30-50% (max. contribution however EUR 1,500 per year).

Top-ups of the basic grants related to investments

Table 14: Level of grants for RDP measure 121 "Modernisation of agricultural holdings" in EU Member States



Specific area payments

Organic farming provides various environmental benefits such as soil conservation, increased faunal and floral diversity as well as reduced soil and groundwater pollution. Although most organic farmers are able to sell their products at a premium price at the markets, additional costs occur. Apart from the Netherlands and France[28], all EU Member States have implemented specific organic farming schemes as a sub-activity of Measure 214 "Agri-environment payments" to cover these additional costs or income foregone. Organic area payments are offered for conversion to and maintenance of organic farming and have been an important driving force for the expansion of organic farming over the last two decades.

Payment rates for individual crops differ substantially between Member States. In order to provide a consistent overview, individual crops have been grouped into seven main land use categories:

- Grassland
- Arable land
- Annual vegetables/herbs

[28] France provides conversion and maintenance payments through a different mechanism (Article 68 of Council Regulation 73/2009). In the Netherlands, no specific organic area payments are provided but organic farmers are supported through general agri-environmental measures.

- Perennials/orchards/fruits
- Greenhouse crops
- Vineyards
- Olive trees

Conversion payments

The organic conversion period is often associated with a decline in crop yields as growers learn new production and management techniques. Coupled with lower premium for "in-conversion" produce, the conversion period can become a financially precarious time for growers. This financial burden has been lessened in the EU by providing subsidies to growers to cover the costs of conversion.

Table 15 provides an overview of the conversion payment rates in different EU Member States. Roughly half of the countries have implemented higher payment rates for the first two or three years, while payments remain constant over the five year period in Austria, Cyprus, Czech Republic, Estonia, Finland, Greece, Latvia, Lithuania, Malta, Slovenia, Sweden as well as some regions in Germany, Italy, Portugal and Spain. Only Denmark, Finland and Ireland (excluding the first six hectares and over 55 hectares of horticultural land) have implemented uniform payment rates across the different land use categories, unlike Austria, the Czech Republic, Hungary, Luxembourg, Malta, Sweden and Portugal, where payment rates vary considerably depending on land type.

Maintenance payments

Table 16 provides an overview of the maintenance payment rates in the different Member States. Generally, EU Member States which provide relatively high conversion support continue to support farmers with relatively high maintenance payment rates. The highest rates for the different land use types can be found in Cyprus and some Italian regions for grassland and arable land, in Malta for annual vegetables, in Cyprus and some regions in Spain for perennials, orchards and fruits, in Austria for greenhouse crops, in some regions in Spain and Cyprus for vineyards and in Italian regions for olive trees.

While the majority of the Member States has lower maintenance payment rates than the average conversion payment rates, 13 Member States (Austria, Cyprus, Czech Republic, some German regions, Estonia, Finland, some Italian regions, Lithuania, Latvia, Portugal (Azores), some Spanish regions, Sweden and Slovenia) have constant payment rates throughout the conversion and maintenance periods.

In addition to Denmark, Finland and Ireland, also England (except grassland) and Wales (except grassland and arable land) have implemented uniform payment rates across the different land use categories during the maintenance period. As with the conversion payment rates, particularly large variations exist in Austria, the Czech Republic, France, Malta, Sweden, Hungary and Portugal.

Average level of support

Average public expenditure for organic support payments under the agri-environmental measure per certified organic hectare (based on EUROSTAT data) varied between EUR 7 (UK excluding England) and EUR 314 (Cyprus) for the period 2008 to 2009 (see Figure). On average, public expenditure amounted to EUR 163 per hectare for EU-27. In seven Member States, public expenditure ranged between EUR 150 and EUR 300 per hectare (Austria, Finland, France, Germany, Greece, Italy and Sweden), whereas in fourteen countries average spending was less than EUR 150 per hectare (Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Hungary, Latvia, Lithuania, Malta, Netherlands, Portugal, Slovakia, Spain and UK, excluding England).

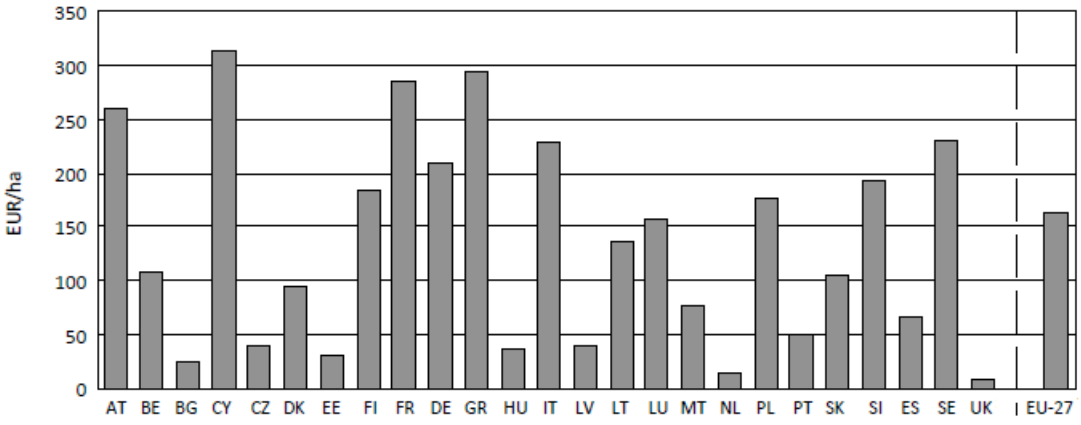



Figure 17: Average public expenditure for organic support payments under the RDP measure 214 per certified organic hectare in 2008–2009