Towards a better integration of biodiversity concerns in the Common Agricultural Policy

The Cumulative Sustainable Rural Development Index

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Abbreviation list

AEI – Agri-Environmental Indicators
AES – Agri-Environment Schemes
ANC – Areas under Natural Constraint
AWU – Annual Working Unit
BI – Biodiversity Index
CAP – Common Agricultural Policy
CBD – Convention for Biological Diversity
CEE – Central and Eastern Europe
CMEF – Common Monitoring and Evaluation Framework
CORINE – Coordination of Information on the Environment
CSI – Core Set of Indicators
DG – Directorate General
DSR – Driving State-Force-Response
EASAC – European Academies Science Advisory Council
EC – European Council
ECNC – European Centre for Nature Conservation
EEA – European Environmental Agency
EEC – European Economic Community
EFA – Ecological Focus Area
EFBI – European Farmland Bird Index
EI – Economic Index
EIP – European Innovation Partnership
EP – European Parliament
EU – European Union
EU-SILC – European Union Statistics on Income and Living Conditions
EUR – Euro (currency of the Eurozone)
DLG – Government Service for Land and Water Management of the Netherlands
FP – Framework Programme
GAEC – Good Agricultural and Environmental Conditions
GDP – Gross Domestic Product
GIS – Geographic Information System
HLY – Healthy Life Years
HNV – High Nature Value
IACS – Integrated Administration and Control System
IAS – Invasive alien species
IEEP – Institute for European Environmental Policy
IRENA – Integration of Environmental Concerns into Agriculture
JRC – Joint Research Centre
LAG – Local Action Group
LFA – Less Favoured Areas
LPIS – Land Parcel Identification System
MFF – Multiannual Financial Framework
MS – Member State

NACE – Statistical Classification of Economic Activities in the European Community
NGO – Non-Governmental Organisation
NRDP – National Rural Development Programmes
OECD – Organisation for Economic Co-Operation and Development
PEBLDS – Pan-European Biological and Landscape Diversity Strategy
PPS – Purchasing Power Standards
RBMP – River Basin Management Plans
RDP – Rural Development Programmes
SI – Social Index
SDI – Sustainable Development Indicators
SMR – Statutory Management Requirements
SRDI – Sustainable Rural Development Index
SWOT – Strengths Weaknesses Opportunities Threats
UAA – Utilised Agricultural Area
UN – United Nations
UNEP – United Nations Environment Programme
UNESCO – United Nations Educational, Scientific and Cultural Organization
UNFCCC – United Nations Framework Convention on Climate Change
WCMC – World Conservation Monitoring Centre
WFD – Water Framework Directive

Executive Summary

The Common Agricultural Policy (CAP) has a long history in the European Union (EU) and although it is a symbol of Community through its market unification and policy harmonization aspects, it also came under severe criticisms during its existence. Since early 1990s, the CAP has gone through a number of reforms aimed at making it a greener, fairer and more sustainable policy for the European farmers, tax payers and consumers. With almost half of the EU budget, CAP is still the single most expensive policy of the Community and expectations towards its deliverables are naturally high.

Coming short of achieving its 2010 Biodiversity Targets, the EU vouched for renewed efforts in halting and reversing biodiversity loss through its 2020 Biodiversity Strategy and Targets. Amongst others, there has been a growing recognition of the fact that agriculture has one of the most significant impacts on biodiversity. Many of the habitats and species of Community Importance are dependent on farming systems. On the one hand, agricultural intensification mostly in Western Europe and on the other hand abandonment of agricultural land in newer Member States (MSs) are some of the main sources of biodiversity loss. There is now consensus that better synergies should be made between agriculture and other sectors in order to make the efforts for stopping biodiversity loss more efficient. At the same time, nevertheless, the Commission highlighted the importance of shifting the focus from nature conservation to sustainable use.

A number of biodiversity or biodiversity-related indicators are operational or currently under development across Europe. Some of the most relevant include Streamlining European Biodiversity Indicators (SEBI) and the Agri-Environmental Indicators (AEI), however there are a number of notable regional/pan-European indicator initiatives such as BioBio. At a local level, there are examples from countries like France, Italy and Romania where simple indicators were developed in order to assess habitat diversity, especially in the context of High Nature Value farmland (HNV). However, the monitoring systems in place for evaluation of CAP measures are directed towards the Rural Development Programmes (RDPs) of Pillar 2, while no assessment is made for Pillar 1, which is responsible with most of the CAP budget.

Drawing from its past studies, from a review of existing indicators and from the experience of members from Central and Easter Europe, CEEweb advances in this a Sustainable Rural Development Index (SRDI) that would support the transition from evaluating from a purely nature conservation approach to a sustainable use of resources and enhancement of ecosystem services, in line with the 2013 Communication of the Commission. The logic behind the study is that preservation or stimulation of biodiversity-friendly farming systems depends on a number of social and economic factors that need to be efficiently addressed by the policy. In the short-term we are confronted with a crucial period in terms of reversing biodiversity loss in European agriculture. However, this process can only be achieved through a sustainable and balanced rural development that would provide the much needed social and economic tools to farmers so that they can truly become the stewards of the environment.

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Introduction

Agriculture in the European Union – an overarching sector

The European Union (EU) has one of the most developed sectors of environmental policy in the world. Recent decades have seen a sharp increase in the percentage of Europeans concerned about the state of the environment and also in the way EU citizens understand environmental issues. A recent study commissioned by the Directorate General (DG) for Environment showed that 96% of Europeans believe that pollution of air and water and man-made disasters are a threat to biodiversity. Also, 94% of EU citizens are aware that intensive farming, deforestation and overfishing are other acute causes of biodiversity loss (EU Commission 2013a). Nevertheless, although EU has a number of policies aimed at halting and reversing biodiversity loss, its 2010 Biodiversity Targets were not achieved. Efforts have been under way for the fulfilment of the new 2020 Biodiversity Targets but there are clear signals for poor progress on most objectives (Birdlife 2012).

Fig. 1) Examples of High Nature Value (HNV), a biodiversity rich farmland (from upper left to lower right): a) Traditional hay meadows and pastures in the Saxony region of Romania; b) Low-intensity, small-scale farming/grazing in Castilla-La Macha, Spain; c) Traditional orchards with permanent semi-natural understory in Southern Germany; d) Mediterranean dry olive crops on Lesvos Island, Greece. Courtesy of Tibor Hartel (a), Berta Martin Lopez (b), Ursel Maichel-Schimtt (c) and Thanasis Kizos (d). Reproduced from Plieninger and Bieling 2013

Indeed, as most Europeans correctly pointed out, agriculture plays a quintessential role in the biodiversity equation. It is estimated that more than half of all European species depend on agricultural habitats, some of which are endemic or threatened (Kristensen 2003). Moreover, according to Keenleyside et al. (2014) 57 semi-natural habitats of Community importance and subject to the Habitats Directive are said to be dependent on specific, low-intensive agricultural practices (see fig.1). Also, the existence of 63 habitats of European conservation interest depend on the continuation of such farming practices (Halada et al. 2011). Agriculture is responsible for 24% of EU's water use but this share can reach as much as 80% in the Member States from Southern Europe (Scardingo and Viaggi 2007). In terms of pollution, more than half of the nitrogen in water comes from farming, which is also a significant source of phosphates (EU Commission 2010).

While this might come as a surprise, it is worth noticing that farming makes up 47% of the European territory (Birdlife 2014) and therefore management practices in agriculture have a direct impact on the availability of natural resources and determine the state of environment for present and future generations. During the past decades, two main threatening processes have shaped the agriculture sector in Europe. On one hand, intensification of production, increase in farm size and mechanisation particularly in Western Europe led to the homogenization and simplification of the landscape and a loss of the biodiversity rich mosaic resulting from traditional agriculture techniques (Jongman 2002; IEEP 2006). On the other hand, farmland abandonment across the EU caused by a combination of socio-economic transformations and climatic-topographic handicaps also contributed to this process, as most traditional agricultural systems need to be actively managed in order to be maintained over time (DLG 2005). Farmland abandonment occurs predominantly in poorer or isolated rural areas and is particularly marked in mountain areas, where a failure to adjust agriculture through changes in farming practices and farm structure means less or no income is generated for businesses and households (MacDonald et al. 2000).

Agricultural land use in Europe has a significant impact on biodiversity and ecosystem services in and outside Natura 2000 sites. For instance, an EU Commission report on the implementation of the Water Framework Directive (WFD) in the MSs concluded that more than 90% of the assessed River Basin. Management Plans (RBMP) pointed to agriculture as a "significant pressure in the basin, including diffuse or point source pollution by organic matter, nutrients, pesticides and hydromorphological impacts" (EU Commission 2012). Also, RBMPs did not provide many details on how NRDPs could contribute to solving this issue. The EU's Common Agricultural Policy (CAP) and its 'second pillar' funds – distributed by Member States through the Rural Development Programmes –thus affect biodiversity and ecosystems. According to the Commission, RDPs should continue to contribute to the conservation of biodiversity in farmed/forested areas, as proposed in the Community's Strategic Guidelines for Rural Development, 2007 –2013 (EU Commission 2012).

Nonetheless, agriculture's role in our society goes beyond food production and biodiversity conservation. 12 million farms span across Europe, engaging approximately 25 million people in farm work, 92% of which were members of the farmholder family (EU Commission 2013b). Family farming does not only play an essential role in food security, but it is also

crucial for the preservation of traditions, local identities and cultural heritage (EU Commissioner for Agriculture, 2013). Some of the biodiversity-rich agricultural landscapes, such as High Nature Value (HNV) farmlands (see fig. 1) have been created over centuries of synergy between rural communities and nature and their characteristics make them central to European identity and culture (Oppermann et *al.* 2012). Following these characteristics, these type of landscapes are considered, at least throughout Europe, cultural landscapes (Plieninger and Bieling 2012) and are congruent to UNESCO`s definition of organically evolved cultural landscape, which:

"results from an initial social, economic, administrative, and/or religious imperative and has developed its present form by association with and in response to its natural environment. Such landscapes reflect that process of evolution in their form and component features." (UNESCO 2008)

Despite its quintessential social, cultural and environmental value, it is imperative to remember that European agriculture is a sector of great inequality. 6 million or half of the total farms across the EU are classified as 'small farms', holdings with less than 2 hectares. However, these holdings only account for the farming of 2.5% of the Utilised Agricultural Area (UAA) despite the fact that farms over 100 hectares – making upp 2.7% of the total farm number in EU – are responsible with the farming of 50% of UAA (Matthews 2013).

Fig. 2) A shepherd and its flock in the Bran region of Romania. Although shepherding is still a common site in Romania, there are increasingly fewer people willing to take on the job. That is why most of them are middle aged or older. Photo courtesy Kaustubh Thapa 2014

The study

High hopes were yielded from the 2013 reform of the Common Agricultural Policy, which was expected to deliver a fairer, greener and more sustainable farming sector for Europeans. However, the political agreement reached in 2013 saw a dilution of the greening measures and brought intense criticisms from conservationists and green NGOs. In 2013, CEEweb released a study to show that for the 2007-2013 NRDPs, agri-environment schemes and other measures with an impact on biodiversity conservation have met with moderate to high success in Central and Eastern Europe, as far as their uptake is concerned (CEEweb 2013).

There are also concerns with regard to the efficiency of these schemes and their impact on biodiversity conservation, which at the same time is difficult to measure, considering that monitoring systems are inadequate or, in many cases, not in place. In the context of EU's 2020 Biodiversity targets, this study reviews the work carried out on biodiversity indicators related to agriculture and on agri-environmental indicators. Analysing the situation for these policy tools, the study examines their limitations and, drawing from the experience of CAP implementation in Central and Eastern Europe, advances policy recommendations for a sustainable integration of environmental concerns into the CAP and a realistic, accurate reflection of the biodiversity conservation progress in agriculture.

Fig 3) Structure of the study

The following chapters will argue that at the moment, there are sufficient tools to examine the progress towards EU's 2020 Biodiversity Targets. These tools are outcomes of various initiatives – some at a local level, but some at a broader national or pan-European level. Nevertheless, progress on achieving the biodiversity targets can only be made through a sustainable rural development of the European farming communities, in particular through maintaining small and medium sized farmers active in the sector. Drawing from the experience of farming dynamics in the CEE, it becomes clear that purely biodiversity-focused indicators are insufficient and in order to assess the genuine progress and predict realistic scenarios for biodiversity status in agriculture, a cumulative tool that embraces the social, economic and environmental aspects of farming communities is needed (see fig. 4)

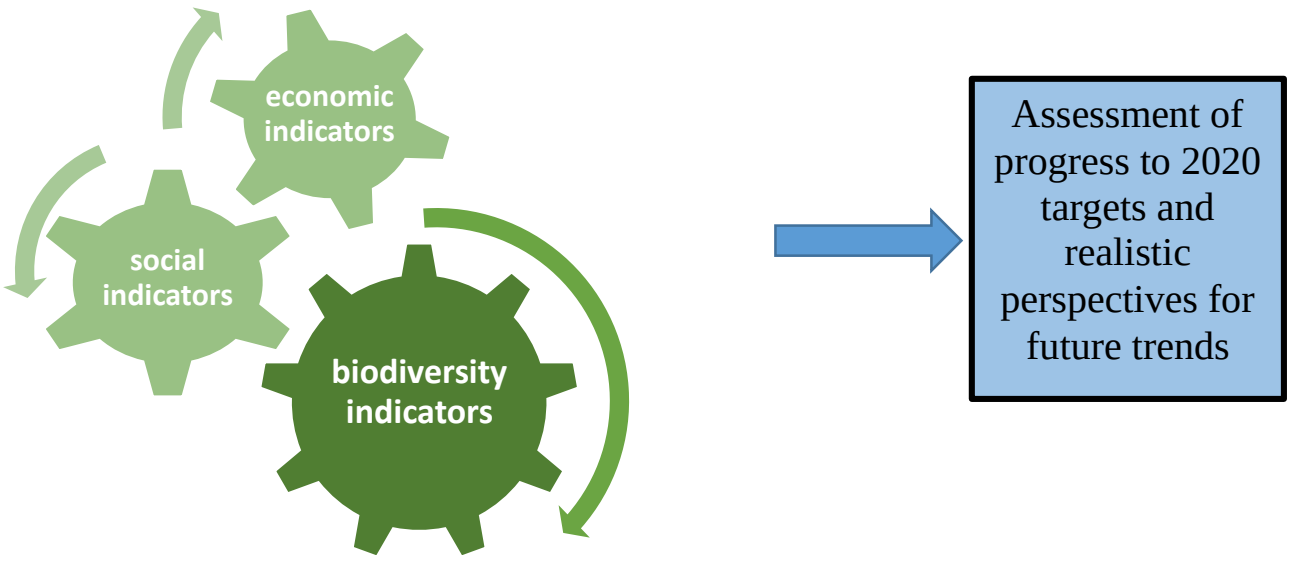

Fig. 4) A cumulative tool to assess progress to 2020 Biodiversity Targets

The Common Agricultural Policy – past and present

After years of post-war food shortages and rations, the newly formed European Economic Community (EEC) decided to establish a policy mechanism that would safeguard food supply, stabilize the market, provide decent income for the farmers and make food items affordable for the general population. During the 1958 Stresa Conference in Italy, Member States set the aims and objectives for the Common Agriculture Policy, which entered into force in 1962. From the very beginning, CAP was the single most expensive measure of the European Union and by 1985 it accounted to 75% of the Community's total budget (EU Commission 2013c). At the same time, CAP has also been perhaps EU's most controversial policy instrument and has undergone a number of reforms during the past 50 years. Its strong initial focus on increasing agricultural production triggered criticisms once Europe recovered from its post-war crisis. Overproduction led to creating the infamous 'butter mountains' and 'wine lakes' in the 1980s and raised serious concerns about human health and the state of environment.

> ***"Where intensive production takes place nature is abused, water is polluted and the land empoverished"*** (EU Commission 1991)

At the same time, the CAP was seen as an unfair mechanism of income distribution, as it was favouring the large farms while neglecting small farmers. In a 1991 Communication to the European Council (EC), the European Commission was observing that 80% of the CAP support was directed to 20% of the farms, which at the same time accounted for the greater part of the land used in agriculture. Moreover, the Commission was stressing that while the policy's budget had increased from 4.5 billion EUR in 1975 to 31.5 billion EUR in 1991, the purchasing power of small and medium farmers improved very little over the same period of time (EU Commission 1991). Finally, the Commission's conclusions were that the CAP needed a prompt fundamental reform and failure to bring the necessary changes would trigger unwanted market response and an untenable budget. It is on this note that the 1992 MacSharry reform took place, in what the Commission described as shifting support from production to producers. The price support for arable crops was significantly reduced and direct payments were introduced to compensate farmers on a per hectare basis, independent of the volume of production. Rotation was introduced on fallow land, which also became subject to appropriate management rules tailored for the local environment and small farmers benefitted from a 'simplified scheme', which meant that they did not have to set aside land. New agri-environment schemes were set in place to encourage less intensive production and more environment friendly agriculture techniques, perhaps the most preeminent being the afforestation measure targeted at improving forest resources and tackling climate change. Finally, two main instruments to support restructuring of farms were implemented: an early retirement scheme for farmers and support for young farmers.

The 1992 reform was reinforced during the 2003 restructuring of the CAP, when in order to further align the agricultural sector to market demand separation between production and direct payments was strengthened in what is now known as 'decoupling'. Environmental and food safety concerns were also better integrated in the new reform through the new 'cross-compliance' requirement, which meant that in order to receive direct payments, farmers had to comply with a minimum number of rules. The cross-compliance measure had two components: the Statutory Management Requirements (SMR) and the Good Agricultural and Environmental Conditions (GAEC).

> ***"Cross compliance rules concern food safety, animal health, plant health, the climate, the environment, the protection of water resources, animal welfare and the condition in which farmland is maintained"*** EU Commission 2014

Through the Agenda 2000, the CAP had previously been restructured in two main pillars in 1999: Pillar 1 for direct payments and Pillar 2 for rural development. The 2003 reform, however, went a step forward, in that it allowed for 'modulation', so that unspent money from Pillar 1 could be redistributed to Pillar 2.

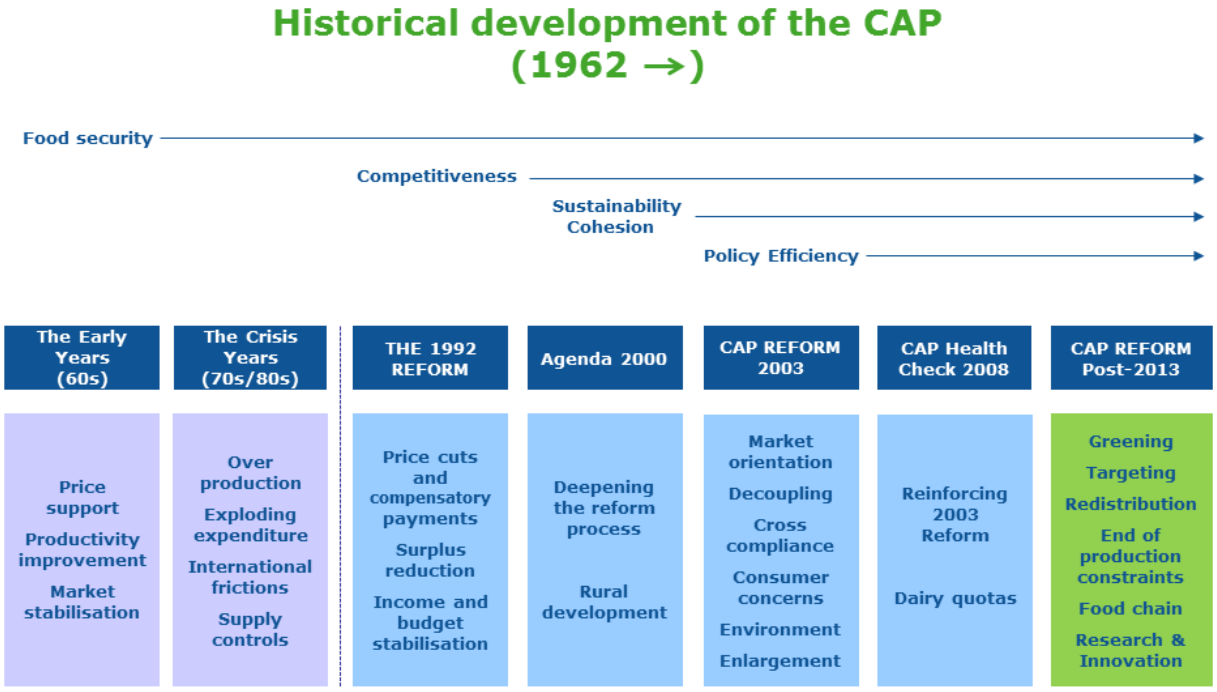

Fig. 5) Historical development of the CAP (source: EU Commission 2014a)

However, for the subsequent 2007-2013 Multiannual Financial Framework (MFF), Member States largely refrained from using modulation, which was also limited to only 20% between countries and sometimes regions. In 2008, the Commission undertook a 'Health Check' of the CAP, which concluded with some notable modifications. First, it was decided that milk

quotas would be phased out by 2015 and this should occur in the form of a gradual increase in the quotas. Secondly, decoupling of support was applied to all products, apart from cow, goat and sheep premia. Thirdly, the set-aside rule was abolished and cross-compliance rules were simplified for farmers. Finally, timid measures to press for more modulation were made, by reducing the amount of direct payments from farmers receiving more than 5000 EUR by 5% and transferring the amount into Pillar 2. An additional 4% was applied for farms receiving more than 300,000 EUR (EU Commission 2014a).

The post-2013 CAP reform was expected with a lot of enthusiasm by environmentalists as it promised more funds for the greening of EU agriculture and a much stronger emphasis on Europe's rural development (see fig.5). Also, it was the first time in history when the European Parliament (EP) acted as a co-legislator for the reform's legal commitments, together with the EC. The CAP's overall policy objectives were seen as viable food production; sustainable management of natural resources and climate action; and balanced territorial development (EU Commission 2014b). Building on this, the reform's objectives were to enhance competitiveness, improve sustainability and provide for greater effectiveness. After three years of reflections, consultations and negotiations, a political agreement between the Commission, Parliament and the Council was reached in June 2013, but its outcome came short of fulfilling its sustainability objectives and its focus on a green European agriculture (Pe'er et al. 2014).

The policy remained EU's budget centerpiece, with 37.8% of the Union's budget for 2014-2020. Pillar 1 accounts for 76.6% of the total CAP budget and Pillar 2 for the remaining 24.4% (EU Commission 2014b). Total CAP budget is expected to continuously decrease between 2013 and 2020: Pillar 1 will account for €37.2 billion in 2020, compared to €43.2 billion in 2013 (a 14% decrease), while Pillar 2 will amount to €11.4 billion compared to €13.9 billion in 2013 (a 18% decrease). Also, the share of the two pillars will slightly change by 2020 –Pillar 1 will account for 76.8% and Pillar 2 to 23.2% in 2020, compared to 75.7% and 24.3% respectively in 2013 (EU Commission 2014b).

In the reformed CAP, both pillars have experienced content changes (see fig 6). For Pillar 1, some of the most important include the clarification of who an 'active farmer' is, in order to exclude entitlement to payments of airports, sports clubs, waterworks or real estate services. Moreover, Ecological Focus Areas (EFAs) are now required under greening, 5% of arable land/farmholding, which must be genuinely beneficial to biodiversity and contribute to the improvement of soil and water quality. However, EFAs apply only for farms larger than 15 ha. By contrast, the average EU size for a farm is 12.6 and can be as low as 3.4 ha in Romania and 5.6 ha in Croatia (Eurostat 2014a). Also, 69% of the European farm holdings are smaller than 5 ha, a number that increases to 89% for holdings under 15ha (EU Commission 2013d). This means that only slightly over 10% of the farmers will actually contribute in the scheme. Moreover, 35.5% of EU's Utilised Agricultural Area (UAA) is exempt from the EFA measure (EU Commission 2013d).

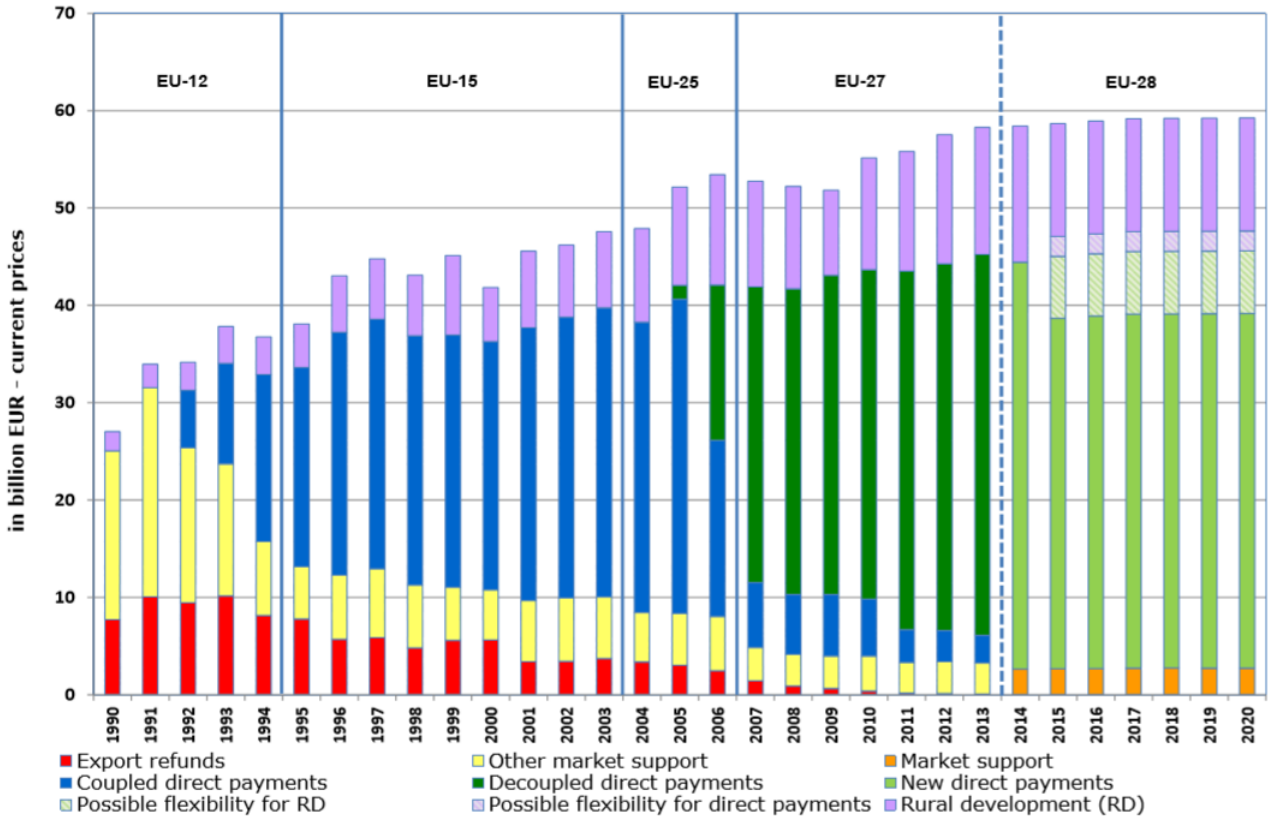

Fig.6) Historical structure of CAP and its Pillar composition for 2014-2020 (source: EU Commission 2014b)

Greening payments have also been extended to protecting permanent pastures and grasslands that provide environmental services for carbon storage and biodiversity–often, in practice, High Nature Value (HNV) farmed landscapes –offering wider recognition and protection than provided within Natura 2000 sites. MSs have, in varying degrees, the option of transferring funds from Pillar 1 to Pillar 2, or reverse from Pillar 2 to Pillar 1. In view of the reduction of the Pillar 2 budget in absolute terms, and as a percentage of CAP budget, it is desirable that MSs favour transfer from Pillar 1 to Pillar 2: with the incentive under the new CAP that such transferred funds do not require co-financing by MSs. Last but not least, MSs may opt to make degressive payments under Pillar 1, offering higher payments per ha for the first 30ha or up to national average farm size, making the CAP fairer for small-and medium-sized farms.

As previously mentioned, the multiannual Pillar 2 budget accounts for 23.4% of CAP expenditure and is subject to national co-funding by MSs of up to 50%17. Pillar 2 is intended to support socio-structural and more targeted environmental measures as well as rural development, not only for farmers but also for rural communities more broadly. Pillar 2 funding is mostly directed towards Less Favoured Areas (LFAs, renamed ANCs or Areas under Natural Constraint), young farmers, AESs and organic farming, animal welfare, investments in agricultural collective infrastructures, innovation, and marketing of food products. Pillar 2 provides a menu of measures from which MSs and regional authorities can set up their 2014-2020 RDPs. MSs are required to spend at least 30% for environmental and

climate measures, including Natura 2000 payments, payments for organic production or environment/climate related investments. Agri-environment measures will benefit from the possibility of including transaction costs for up to 20% of the premium paid, which will be available for farmer groups as well as individual farmers. In this way, it is expected that the measure will be more attractive. The afforestation measure (221) will require caution, protection of grasslands and the use of local species. The Cooperation Measure, including the newly-launched European Innovation Partnership (EIP), is expected to support joint projects in all fields, among groups of farmers, NGOs and rural development movements, academics and businesses. The LEADER programme remains as an additional tool in strengthening rural development networks and a community led local development approach (EU Commission 2014b).

EU 2020 Targets and Biodiversity Indicators

Although Europe did not manage to meet its 2010 Biodiversity Targets, renewed efforts have been made towards achieving the new set of targets set for 2020. One of the six EU targets is aimed specifically at agriculture and forestry, stating that EU should

"By 2020, maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP so as to ensure the conservation of biodiversity and to bring about a measurable improvement in the conservation status of species and habitats that depend on or are affected by agriculture and in the provision of ecosystem services as compared to the EU2010 baseline, thus contributing to enhance sustainable management." (EU Commission 2014c)

Although somehow vague and not as ambitious as the 2010 Targets, the 2020 Biodiversity Strategy clearly highlights the importance of agriculture and, even more, the central role CAP should play in the conservation of biodiversity and provision of ecosystem services. Nevertheless, the 2008 CAP 'Health Check' acknowledged that biodiversity is still a challenge that needs serious attention (EU Commission 2008), in spite of an exhaustive Biodiversity Action Plan for Biodiversity the Commission launched in 2001, which aimed to promote and support environment-friendly agricultural practices, enhance sustainable farming and good ecological infrastructure and genetic pool.

In a 2013 report from the European Commission to the European Parliament, the Council and the European Economic and Social Committee, it was highlighted that in order to preserve the genetic diversity of European agriculture, policy must be shifted from conservation to sustainable use (EU Commission 2013e). The report also pointed out to the number of projects dedicated to enhancing genetic diversity for the Community's agricultural sector. The Commission provided a figure of 59,000 contracts awarded through national rural development programmes in 21 Member States during 2007-2011, totalling 143 million EUR (EU Commission 2013e). However, a simple look at the figure with the evolution of CAP budget will show that for the same period, more than 250 billion EUR were spent on CAP - making the 143 million EUR a mere 0.006% of the CAP budget. At the same time, 59,000 contracts are equivalent to only 0.05% of the 12 million farms reported in EU in 2010 (see Fig.7).

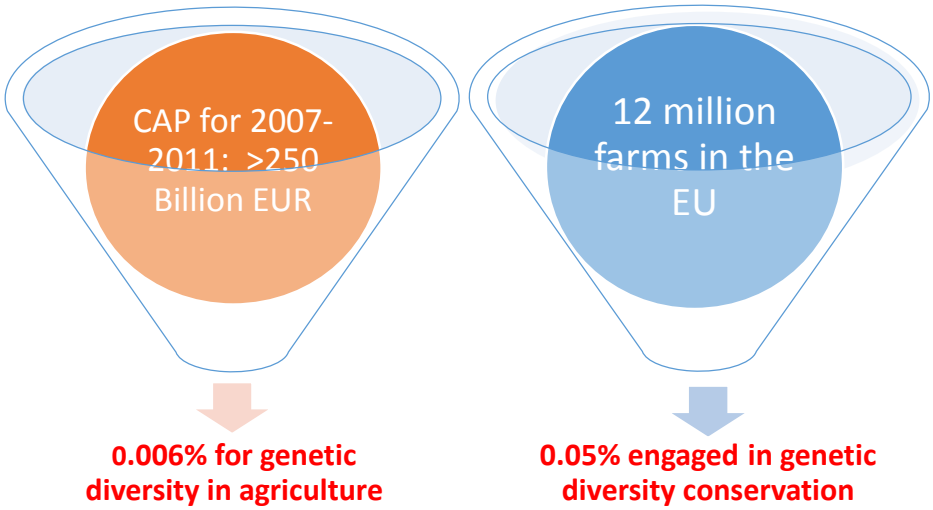

Fig.7) Comparative spending on preservation of genetic resources in agriculture vs. the total CAP budget and total number of farms in the EU

What are indicators?

Indicators have a wide range of definitions, however, an oversimplified interpretation would point to the fact that "indicators help you understand where you are, which way you are going, and how far you are from where you want to be" (Hart 1995). A similar approach is vouched by the United Nations (UN), from whose perspective indicators should address four main policy questions:

- what is changing?
- why is it changing?
- why is it important?
- what are we doing about it?

(UN 2014)

According to the definition of indicators adopted by the UN, there are several core characteristics of this concept. First of all, an indicator has to be valid, in that in provides an accurate measure of the outcome resulted from an intervention. Second, an indicators also has be precise and measurable – its quantity should be determined by using available tools and methods Moreover, it has to be reliable and so consistently measurable over time by various observers using a similar methodology. A good indicator is simultaneously timely, which means it is able to provide periodical measurements, fit for the goals and objectives of the programme. Last but not least, the indicators have to be programmatically important. In other words, it has to be linked to the programme or to achieving the programmes objectives (UN 2014).

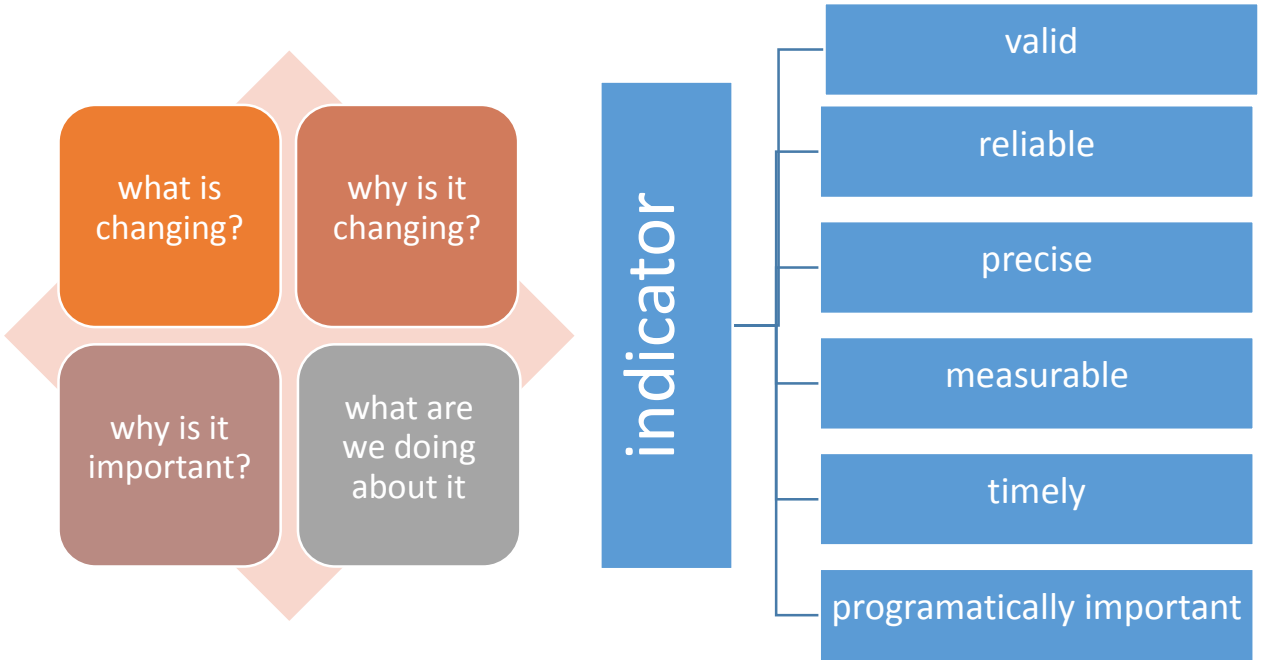

Fig.8) Main questions and characteristics specific to an indicator (adapted from UN 2014)

Biodiversity indicators in Europe

In order to assess and inform on the progress towards EU's 2010 Biodiversity targets, Streamlining European Biodiversity Indicators (SEBI) was launched in 2005 at a Pan-European level. SEBI is a partnership between European Environmental Agency (EEA), its Topic Centre on Biological Diversity (ETC/BD), DG Environment of the European Commission, the Czech Republic (as lead country for the Kiev Resolution action plan on biodiversity indicators, the European Centre for Nature Conservation (ECNC), UNEP/PEBLDS Secretariat, and UNEP-WCMC (the World Conservation Monitoring Centre). By 2006, 26 indicators were established by a network comprising more than 120 experts across Europe. Indicators ranged from ecosystem coverage to nitrogen balance in agriculture and public awareness. The main characteristic of SEBI is that the initiative was created with the purpose of building on already existing monitoring and modelling activities so that it does not duplicate efforts (EU Commission 2014d).

In terms of agriculture, the most relevant indicators are SEBI 006 Livestock genetic diversity, SEBI 019 Agriculture: nitrogen balance, SEBI 020: Area under management practices potentially supporting biodiversity. Nevertheless, essential information for agro-systems is also provided through SEBI 001 Abundance and distribution of selected species, SEBI 003 Species of European interest and SEBI 005 Habitats of European interest. A number of trends have been observed with the help of these indicators. For instance, estimates show that Utilised Agricultural Area (UAA) under organic production increased 42% between 2005-2010, comprising at present 5.1% of EU's total UAA (Biala 2014). Also, SEBI 003 indicates 80% of assessments for amphibians linked to agro-ecosystems are unfavourable. Common bird populations were also shown to have decreased by 14% in 22 European countries since 1990, while European grassland butterflies recorded a drastic

decline of 70% for the same period (Biala 2014). Nevertheless, SEBI indicators have a number of limitations that are widely recognised. For example, SEBI 006 is restricted to a very small subset of biodiversity and does not say much about agro-biodiversity at large. Another limitation is that it is not clear how to assess genetic diversity from the morphological diversity of varieties, but this limitation could be surpassed by performing genetic studies (EASAC 2005). In the case of SEBI 003, the status of threatened and/or protected species is always made difficult by the fact that such species are, because they are threatened and/or protected, usually rare and, therefore, their status and trends in abundance are difficult to measure (EASAC 2005, see table 1 below).

SEBI	Description	Limitations
003	Species of European interest	The status of threatened and/or protected species is always made difficult by the fact that such species are, because they are threatened and/or protected, usually rare and, therefore, their status and trends in abundance are difficult to measure.
005	Habitats of European interest	This indicator says little about the condition of the remnant habitats and ecosystems. For instance, habitat loss could be halted, but other drivers such as direct exploitation, invasive species and pollution could still push the decline of species and populations.
006	Livestock genetic diversity	This indicator is restricted to a very small subset of biodiversity and does not say much about biodiversity at large. Another limitation is that it is not clear how to assess genetic diversity from the morphological diversity of varieties, but this limitation could be surpassed by performing genetic studies.
019	Agriculture: nitrogen balance	The relationship between nitrogen deposition and surplus and the impact on habitats/species is only established to a certain extent.
020	Agriculture: areas under management practices potentially supporting agriculture	Despite the development of indicators of sustainability in forestry and agriculture, only some of these indicators provide information on an area basis. The derivation of a composite indicator or the selection of a single indicator to describe the area of an ecosystem under sustainable management is challenging: information from sustainability indicators that do not provide data on an area basis will be lost. Nevertheless, indicators such as the area of high nature value farmland are potentially valuable single indicators of area under sustainable management (see EEA 2004). ICES data could be mused to establish the area of fisheries under sustainable management, although differences in the assessment of sustainable management of different fish species in the same area is a complicating factor. The prospects for developing this indicator meaningfully for aquaculture is much less good.

Table 1) Main EU biodiversity indicators with direct or indirect reference to the agriculture sector (Adapted from EASAC 2005)

Indeed, while SEBI indicators are constantly being improved and diversified, agriculture does not seem to play a central role to their focus. This is despite the fact that half of all European species rely on agricultural habitats (Kristensen 2003) and the sector accounts for 47% of EU-27 land-use (EU Commission 2013c). Nevertheless, either through research projects of institutions and experts throughout Europe or through EU-level initiatives, recent years have seen a push for the development of agri-environmental indicators.

At the EU level, the Commission has formulated a number of agri-environmental indicators as a recognision of the impact the farming sector has on the environment in general and biodiversity in general. In its 2000 "Communication to the Council and the European Parliament on Indicators for the integration of environmental concerns into the Common Agricultural Policy", the Commission highlighted that intensification of farming and land abandonment are two characteristic processes that have shaped the EU's agriculture during the past decades. Nevertheless, it is those processes that led to degradation of water, soil and air and a decrease in biodiversity. Therefore, the Commission vouched for a better integration of environmental concerns into the CAP and a set of operational agri-environmental indicators that would enable policy-makers to measure environmental efficiency (EU Commission 2000). Part of EU's Renewed Sustainable Development Strategy, the indicators aim to:

- Provide information on the farmed environment
- Track the impact of agriculture on the environment
- Assess the impact of agricultural and environmental policies on environmental management of farms
- Inform agricultural and environmental policy decisions
- Illustrate agri-environmental relationships to the broader public

(Eurostat 2014b)

The Communication was followed by a project between EEA as a coordinating body, DG Environment, DG Agriculture and Rural Development, Eurostat and the Joint Research Centre (JRC). Under the name of Indicator Reporting on the integration of Environmental concerns into Agriculture (IRENA), the project's outputs were a list of 42 indicators and sub-indicators and their respective 40 factsheets for EU-15. Subsequent to its 2006 Communication, the Commission finally decided on a total of 28 indicators, grouped in 4 domains: responses; driving forces; pressures and benefits; and state/impact. Moreover, 13 sub-domains were created for the main domains, in order to accommodate the complexity and inter-dependency between human activities, agriculture and biodiversity (see table 2). For instance, the water abstraction indicator provides an estimated share of the agricultural sector in terms of freshwater abstraction, which was found to reach as much as 80% of some of the Southern and South Eastern European regions (Eurostat 2014b). Another agri-environmental indicator looks at farmers' training level and the extent to which environmental farm advisory systems are used. However, only 9 of the 28 indicators are operation and available for analysis, while the remaining 19 are undergoing further

Domain	Sub-domain	Nr	Title
Responses	Public policy	1	Agri-environmental commitments (O)
		2	Agricultural areas under Natura 2000 (U)
	Technology and skills	3	Farmers' training level and use of environmental farm advisory services (U)
	Market signals and attitudes	4	Area under organic farming (O)
Driving forces	Input use	5	Mineral fertiliser consumption (U)
		6	Consumption of pesticides (U)
		7	Irrigation (O)
		8	Energy use (U)
	Land use	9	Land use change (U)
		10.1	Cropping patterns (O)
		10.2	Livestock patterns (O)
	Farm management	11.1	Soil cover (U)
		11.2	Tillage practices (U)
		11.3	Manure storage (O)
	Trends	12	Intensification/extensification (O)
		13	Specialisation (O)
		14	Risk of land abandonment (U)
Pressures and benefits	Pollution	15	Gross nitrogen balance (O)
		16	Risk of pollution by phosphorus (O)
		17	Pesticide risk (U)
		18	Ammonia emissions (U)
		19	Greenhouse gas emissions (U)
	Resource depletion	20	Water abstraction (U)
		21	Soil erosion (U)
		22	Genetic diversity (U)
	Benefits	23	High Nature Value farmland (U)
		24	Renewable energy production (U)
State/Impact	Biodiversity and habitats	25	Population trends of farmland birds (O)
	Natural resources	26	Soil quality (U)
		27.1	Water quality - Nitrate pollution (U)
		27.2	Water quality - Pesticide pollution (U)
	Landscape	28	Landscape - state and diversity (U)

Table 2) AEI developed by the Commission. Operational indicators are indicated with "(O)", indicators still undergoing preparation with "(U)" (adapted from Eurostat 2014b).

preparation. Furthermore, the Commission acknowledged that in addition to the conceptual and methodological improvements needed at the moment, a full set of operational indicators will be reached only after considerable efforts will be channelised to overcome data deficiencies and extension of the indicators to the new Member States (EU Commission 2014e).

The EU-wide initiative to integrate environmental concerns into the CAP was not left without alternatives. A number of local, regional or even pan-European projects have been carried out with the purpose of providing more accurate, region-specific agri-environment indicators. A "Biodiversity indicators for organic and low-input farming systems" project was conducted between 2009 and 2012 within the EU's FP7 Research and Innovation programme. It implied the selection and testing of a number of candidate indicators on 195 farms across 12 case study regions across Europe. The findings permitted a further narrowing-down of the indicator list to a core set of eight indicators for habitat diversity, four indicators for species diversity, three indicators for genetic diversity and eight indicators for farm-management practices. These 23 indicators are said to complement the aforementioned SEBI and IRENA indicators and cost estimates for their implementation on 50,000 farms across the EU would, according to the authors, amount to 0.25% of the total CAP budget (Agroscope 2012). The set of indicators are related to a number of characteristics (see table 3) and throughout the 12 case studies, they have proved to show a considerable value fluctuation on a farm-by-farm and region-to-region basis. 16 of the 23 indicators were found applicable to all farm types, while the other 7 are restricted to specific types of farms, such as farms with specialized grazing livestock and farms with field crops and horticulture. The indicators were not tested on highly- intensive or industrial crop or permanently housed, animal production farms (Agroscope 2012).

BioBio Indicators	- Farm-management indicators relate to external inputs (energy, nutrients, pesticides), disturbances (field operations used in the cultivation of horticultural, arable and forage crops) and livestock husbandry.
	– It relates to the scale of individual farms;
	– It focuses on "state indicators" which report on the actual status of biodiversity;
	– Habitat diversity indicators cover the different habitat types, their geometry, and their nature;
	– Species diversity indicators cover the different trophic levels and major ecological functions of biodiversity;
	- Genetic diversity indicators address the diversity of both crop species and livestock;

Table 3) BioBio Indicators and their main characteristics

Biodiversity indicators have been proposed at a local level as well. For instance, ADEPT Foundation of Romania developed a butterflies and moth indicator for the High Nature Value (HNV) dry grasslands of Transylvania. It was found that the degree to which 22 butterfly and moth species are present in the Transylvanian HNV dry grassland habitats provides an accurate indicator on the habitat's preservation status. Within the same EU-funded SIPA LIFE project, ADEPT also established a set of indicator plants of the HNV dry grasslands of Transylvania. Similarly to the butterfly and moth indicators, a number of 30 easily identifiable plant species were selected as representative for the habitat, most of them widespread while some of them locally scarce.

A study developed by Pointreau et al. (2010) was similar to the Romanian case, in that the authors developed an aggregated indicator to identify High Nature Value farmland in France. The three main characteristics of the indicator were diversity of crops, the degree to which farming systems were extensive and the presence of landscape elements distinctive to HNV farmland. Finally, a scoring system was created and offered the possibility to have a variable HNV threshold (Pointreau et al. 2010).

Farmland birds have also been used to indicate the presence of High Nature Value farming. Morelli et al (2013) used a species distribution model (SDM) to evaluate HNV farmland in Central Italy and identified a set of birds that were particular to the HNV agricultural habitats. In addition to their overall conclusion that small scale heterogeneity in farming systems is crucial for nature conservation, the authors showed that by only monitoring four bird species they were able to indicate whether HNV farmland was present or not with an accuracy of 82% (Morelli et al 2013). A basic and simple ecologic assessment tool, this initiative could be valuable in addressing the success of agri-environment policies in the region.

Another study by Butler et al. (2010) quantified the impact of land-use change to European farmland bird populations, which is measured through the European Farmland Bird Index (EFBI) and analysed the key drivers of population change in agricultural landscapes across 20 countries. The authors concluded that changes in resource availability within the cropped area of agricultural landscapes have been the key driver of current declines in farmland bird populations. EFBI is a pan-European monitoring scheme of common birds and it comprises supra-national indices for four main European regions: West, North, East and South, calculated as an average of the constituent countries. National indices are provided for a total number of 135 bird species and the trends are weighted by relative breeding population size of each bird species in each country (Baltic Compass 2012).

Limitations of the use indicators

The Agri-environment measures (AEM) of rural development programmes have a set of requirements for indicator and monitoring called the Common Monitoring and Evaluation Framework (CMEF). Article 81 of Regulation (EC) No 1698/2005 defines that the progress, efficiency and effectiveness of rural development programmes 2007-2013 (including AEMs) in relation to their objectives shall be measured by means of indicators relating to the baseline situation as well as to the financial execution, outputs, results and impact of the

programmes (EU Commission 2005). The CMEF provides a single framework for monitoring and evaluation of all rural development measures and defines a common set of input, output, result, impact and baseline indicators for the rural development programmes. Baseline indicators are used to develop a Strengths Weaknesses Opportunities Threats analysis as the basis to define strategy objectives

Baseline indicators can be differentiated between objective and context-related baseline indicators. The former are directly linked to the wider objectives of the programme and form the reference against which a programme impact will be assessed. Examples are employment in the food industry, index of population of farm birds, self-employed persons and share of population covered by Local Action Groups (LAGs). Context-related baseline indicators provide information on relevant aspects of the general contextual trends (economic, social and environmental) that are likely to have an influence on the performance of the programme. Examples are percentage of land that is defined as Utilised Agricultural Area (UAA), percentage of UAA under Natura 2000, and percentage of long-term unemployment (Baltic Compass 2012).

With the intention of assessing the overall effect of the programme, a number of impact indicators are defined and in terms of environment and biodiversity, some examples are the maintenance of HNV farmland and forestry, tackling climate change or improvements in water quality. This overall strategy is the basis of designation for rural development measures at MS level. For each of the measures, attention will be paid to financial input, output and the value of result indicators, which are designed to quantify the direct and immediate effect of any single measure and inform on changes such as the area under organic farming, the number of farmers trained, the number of new young farmers registered, etc.

The evaluation of the extent to which a programme has achieved its strategy objectives, is built up from the outputs and results of individual measures through the hierarchy of objectives and assessed against the impact indicators at programme level. In other words, input, output and result indicators are applied at measure level, i.e. at AEM level, while the impact indicators aim at measuring the environmental (as well as socio-economic) effects of the whole programme. Nevertheless, in order to achieve a more accurate picture of the programme impact, it is recommended that additional indicators in line with CMEF guidance are drawn by MS and related stakeholders (Baltic Compass 2012).

While the CMEF's objective is to allow for a comparison between MSs and provide a condensed EU level state of affairs (Grajewski and Schrader, 2005), there are a number of limiting factors that make CMEF a rather inflexible, and potentially inaccurate tool. First, there is the great variety and heterogeneity of rural landscapes across Europe and the fluctuating degree of ecosystem service provision between European regions and states. According to Mortimer et al. (2010), this mixed-grained matrix of biodiversity richness and ecosystem services requires a broader set of indicators, distinctive methodologies and a wider range of flexibility in assessing the performance of agriculture.

Undoubtedly, more research is required to define further suitable impact indicators and monitoring requirements which need to be tested through elaborated case studies (Gijsegham et al., 2011, Oréade-Brèche, 2005).

Terluin and Berkhout (2011) question the cost-effectiveness of the strict application of the common impact indicator approach in the CMEF and suggest a mixed case study approach combining integrating qualitative methods to achieve a better understanding of the causal relationships and to reduce the data requirements and associated costs and efforts. Water as a public good is strongly linked to agriculture both in terms of quantity and of quality. Irrigation use leads to a depletion of exhaustible resources such us groundwater reservoirs and it increases conflicts with competitive use of water resources. Intensive agriculture, which relies on the use of fertilizer and pesticide application, plays an important role in increasing agricultural production, although contributing to water pollution (Baltic Compass 2012).

The indicator assessing how European agriculture reverses biodiversity decline is measured through an aggregation of the farmland bird indicator and the maintenance of HNV agriculture and forestry. The Institute for European Environmental Policy (IEEP) published a guidance on the HNV indicator, recommending the use of sample surveys to capture changes in HNV farming practices and in associated nature values. However, Bormann et al. (2009) still report uncertainties about what should be measured as high nature value areas which led to delays in the fieldwork for data collection.

The farmland bird indicator is designed as an impact indicator for the whole programme at regional or national scale and is not intended to measure the effectiveness of specific agrienvironment measure implemented at site level (Lukesch and Schuh, 2010). Moreover, biodiversity is strongly impacted through other sectors, such as industries and tourism – in order to accurately assess the effect of agriculture on reversing biodiversity loss, a set of additional indicators from other sectors need to be added. Also, some argue that a more elaborate and detailed set of indicators is needed, in order to take into account wider species composition and abundance as well as the state of the biotopes (Barankova et al., 2010; Huelemeyer and Schiller, 2010). A wider indicator approach was used by Gomiero et al. (2011) comparing the environmental performance of organic and conventional farming on the basis of a wide range of different indicators including crop, fauna and habitat diversity as well as effects on pest control and pollinators. Another example if the previously mentioned BioBio project. Similarly, also Simoncini (2010) proposes a monitoring approach with several sets of indicators capturing the state of the agro-ecosystems, the local agricultural land use and practices and the impacts of agrienvironmental measures upon the ability of agro-ecosystems to deliver environmental goods and services. The CMEF needs to be understood as unified minimum requirements at EU level and flexibility applied in the selection of appropriate indicators to address spatially explicit environmental problems. Additional environmental outcome indicators at measure level will help to assess the required impact indicators at programme level (Baltic Compass 2012).

Cumulative sustainable rural development index (SRDI)

Last year's CEEweb report on the performance of NRDPs in Central and Eastern Europe signalled many of the limitations pointed out in the previous section. Our study showed that quantitatively, NRDP measures with a direct or partial focus on biodiversity conservation, and measures with no direct focus but potentially positive impact on preservation of biodiversity, recorded moderate to high uptake levels in CEE for the period between 2007 and 2013 (CEEweb 2013).

However, this raised concerns with quality: that is, with regard to the actual impact of measures on reversing biodiversity loss and improving soil and water quality, which were some of the quality targets envisaged by MSs. Also, in most of the cases there was no systematic monitoring of how measures performed in terms of their environmental impact; collection and reliability of data was a major issue. Therefore, although it was acknowledged that to some extent measures such as AES, LFA and Natura 2000 payments contributed to the preservation of HNV grasslands, through stabilisation of income for HNV farmers and reduction of land abandonment, their actual impact on biodiversity was unclear. In some cases, a need for stricter and more efficient control and inspection was identified – this included organic farming and non-productive investments. All case studies offered recommendations for stricter requirements on specific biodiversity conservation issues, considered essential for the efficient channelling of budget resources and for improving their contribution to biodiversity conservation. In this sense, top-up payments for higher-level environmental schemes were seen as an efficient tool to achieve biodiversity targets (CEEweb 2013).

The study also revealed that information and training play a key role in the effective implementation of environment-related measures through the NRDPs, especially for newer MSs. Nevertheless, some of the shortcomings identified for a number of measures were linked to inefficient training services: performance of these services is connected to whether the contracting training body is local/regional or national. If local/regional, services are more adapted and responsive to regional differences and farmer needs. If national, they are characterised by lack of flexibility and failure to identify regional/local constraints and necessities. Uptake rates for measures can be seven times higher (number of farmers) and five times higher (amount of land) where highly-motivated NGOs have helped to promote the measure with farmers. This is because local NGOs benefit from a higher degree of trust from the local communities, making them more willing to adopt greener agricultural schemes. Also, local NGOs tend to have a rich experience with the on-the-ground performance of such measures and can therefore efficiently work to eliminate implementation bottlenecks.

It is important that small scale farmers can benefit from NRDPs in order to become more economically viable. This is especially the case in CEE countries where average farm size is smaller than EU average and farmers are a defining segment of the society - only Romania concentrates nearly 4 million farms, which is more than a third of EU's total farmholdings (EU Commission 2013d). In spite of this, the 2013 study found that inclusion of small scale farmers in the NRDP schemes proved, in some cases, challenging. This was because the

design of some measures did not take into account regional or even national particularities and the authors concluded that eligibility criteria should be made more flexible and the application process simplified (CEEweb 2013).

Having taken note of the results from 2013 and after reviewing the existing set of biodiversity, sustainable development and agri-environmental indicators, it becomes clear that progress to achieving biodiversity targets cannot be assessed with the current tools and a more comprehensive, holistic and integrated method is necessary. At the same time, the reporting on RDP performance at the MS level is not only experiencing serious gaps and insufficiencies but it also acts separately from other sectors with direct impact on biodiversity, including farmland habitats. Last but not least, indicators should tap much more into the Pillar 1 of CAP, especially in the context of a reformed policy where green payments are to be introduced in 2015. In line with the Commission's shift from nature conservation to sustainable use, a cumulative index of rural development is needed to assess the causes of biodiversity loss, the processes governing the sustainable management of farmland and the efficiency of responses taken to reverse biodiversity loss.

As a baseline methodology, this study used the Driving State-Force-Response (DSR) framework, launched by the OECD in 1997. The DSR framework takes into account the specific characteristics of agriculture and its relation to the environment. The DSR framework addresses a set of questions related to the complexity of agri-environmental linkages and feedbacks (OECD, 1999), including:
• What is causing environmental conditions in agriculture to change (driving force)?
• What effect is this having on the state or condition of the environment in agriculture (state)?
• What actions are being taken to respond to changes in the state of the environment in agriculture (response)?

(OECD 1997)

The purpose of a sustainable cumulative rural development index would be to provide an accurate indication of the social, economic and biodiversity state of the rural communities at various scales (from farm level to EU level). The index is also an algorithmic combination of already existing (or in the course of development) indicators, building on existing resources rather than doing double work. The index would work out 1) as an average of the three indices if each of the three are higher than 0.5 (threshold to unsustainability) 2) as the lowest value derived from three separate indexes, is at least one of the three scores less than 0.5.

1) **[SI (0-1) + EI (0-1) + BI (0-1)]/3 = SRDI** for SI, EI and BI > 0.5 (see section on challenges)
2) **SRDI = lowest value of SI, EI or BI for scores < or = to 0.5**

SI= social index; EI = economic index; BI= biodiversity index

SRDI would therefore:

1) Provide a hierarchy of sustainable rural development progress as per farm, local, regional, national and EU level.
2) Point to key causes for poor IRDI, so that NRDP and Direct Payments measures are better tailored for implementation at those different levels. For instance, if an area is at present doing well in terms of biodiversity but suffers in terms of economy and/or has significant social issues such as an ageing population, it means in the mid to long run those 2 factors would negatively influence biodiversity status. Implementing authorities and policy makers should then come up with a solution.
3) Give equal weight to biodiversity, social and economic factors. Thresholds should be set within each indicator index in order to identify critical or undesirable conditions.

The need for such an index is justified by the limitations of biodiversity indicators alone to provide an accurate and realistic scenario for biodiversity trends. These indicators are useful insomuch as they can show the state of biodiversity at any given time in present. At the same time, one can analyse the past trends of indicators up to present and reflect on whether there was an overall loss or gain in biodiversity. Nevertheless, future predictions depend on a complex matrix of other factors and some representative examples are the level of education and training of farmers, population structure of rural communities, economic viability of farms, market accessibility or opportunities for income diversification.

A first draft for SRDI

Below is a first proposal of indicators grouped in the 3 indexes. All indicators have already been developed by the EU Commission, JRC, Eurostat or EEA and there is a fairly satisfactory availability of data for each of them. As previously mentioned most indicators are tailored for national level with only a few in the process of being made available at regional level.

Social Index:

Indicator	Components	Data sources
Innovation, competitiveness and eco-efficiency	1) Total R&D expenditure 2) Turnover from innovation 3) Energy intensity of the economy 4) Real effective exchange rate	Eurostat
Inequality of income distribution	The ratio of total income received by the 20% of the population with the highest income (top quintile) to that received by the 20% of the population with the lowest income (lowest quintile)	Eurostat

Education and training	1) At-risk-of-poverty rate by the highest level of education attained 2) Lower secondary educational attainment by age 3) Lifelong learning 4) Tertiary educational attainment, by sex, age group 30-34	1)Eurostat
Public expenditure on education	Total public expenditure on education as a percentage of Gross Domestic Product (GDP)	1) Eurostat 2) Available at national level
Community bond	1) number of residents that are part of a family-run business 2) number of people that are part of associations	1) Available at national level
Old-age income adequacy	1) Duration of working life 2) Aggregate replacement ratio 3) At-risk-of-poverty rate of elderly people	Eurostat
Business ownership by age	Percentage of businesses (family farms) run by different age groups	Eurostat DG Environment National statistics
Healthy life years and life expectancy at birth, by sex	The indicator Healthy Life Years (HLY) at birth measures the number of years that a person at birth is still expected to live in a healthy condition	Eurostat
Openess and participation	Voter turnout in national and EU parliamentary elections	Eurostat
Trust in governance	1) Level of citizen confidence in EU institutions 2) Level of citizen confidence in regional and national institutions	Eurostat

Table 4) SRDI Social Index subcategory

Economic Index:

Indicator	Components	Data Sources
Agricultural Entrepreneurial Income	1) Agricultural entrepreneurial income (or "family farm income") 2)annual working unit (AWU) in agriculture,gross wages and salaries in all NACE activities 3)the total number of hours worked per employee in all NACE activities.	1) Eurostat–Economic Accounts for Agriculture 2) Eurostat–Agricultural Labour Input Statistics
Agricultural factor income	1) Agricultural factor income 2) annual working unit (AWU)	Same as before
Rural employment rate	Employed persons aged 15-64 and 20-64 as a share of the total population with the same age group from thinly populated areas	Eurostat
Degree of rural poverty	It is calculated as the percentage of people who are at risk of poverty or severely deprived or living in a household with low work intensity over the total population.	1) Eurostat 2) EU-SILC
Rural GDP per capita	1)PPS per inhabitant in rural, intermediate and urban areas 2)PPS per inhabitant in percent of the EU average for rural, intermediate and urban areas.	
Economic diversification	% of residents engaged in more than one type of economic activity	National statistics

Table 5) SRDI Economic Index subcategory

Biodiversity Index:

Indicator	Components	Data sources
Emissions from agriculture	1)Aggregated annual emissions of CH_4 and N_2O from agriculture 2)Aggregated annual emissions of CO_2 from agriculture 3) Ammonia emissions from agriculture	1) MS reports to UNFCCC and the EU Monitoring System 2) EEA
Farmland Bird	1) AEI 25	1) Eurostat

Index	2) SDI Common Birds Index 3) SEBI 01	2) European Bird Census Council 3) National indices
HNV farming	% of UAA farmed to generate HNV	1) National/regional data 2) CORINE 3) IACS/LPIS 4) Agricultural census data 5) Species and habitats databases 6) GIS 7) RDP monitoring 8) Designations (e.g.Natura2000)
Water abstraction in agriculture	AEI 20	Eurostat
Water quality	1) Gross nutrient balance (CSI 020; AEI 16) 2) Nitrates in freshwater (AEI 27.1; AEI 15;)	1) Eurostat 2) EEA 3) DG Environment
Soil organic matter in arable land	1) Productivity index 2) Fertilizer response rate 3) Production response rate 4) Soil environmental services index	Developed by JRC 1) AEI 26
Soil erosion by water	1) soil loss rate: AEI 21 2) agricultural area affected by a certain degree of soil erosion by water 3) EIONET-SOIL	1) JRC 2) Reports at national level

Table 6) SRDI Biodiversity Index subcategory

Challenges

First, SI, EI and BI should each provide a realistic and accurate picture of the state of rural communities and environment. This means that each index needs a careful and balanced selection of indicators and the algorithm used to calculate the individual indexes might not give equal weight to each indicators. For instance economic viability of farms could weight more than opportunities for income diversification. At the same time, too many indicators within each index might make the process of calculating SRDI costly and complicated. A solution here would be to select the most influential indicators and match them, if possible, in equal-weight groups. These indicators should also be easy to measure and ideally, data should be readily available.

Applying SRDI to different farming systems. Intensive, production-oriented farming systems could score high for EI but relatively low for BI, while other systems can score high

for BI but lower for EI – this should be clearly visible in the SRDI and setting up a threshold for each index can be part of the solution. A 3-level hierarchy for SRDI would separate rural regions into 1) sustainable; 2) moderately viable and 3) unsustainable. For instance:
0-0.5 = unsustainable
0.5-0.7= moderately viable
0.7-1= sustainable

Downsizing from MS level to regional/community level. Most indicator data is available at the MS level, which means that regional and local variety is overlooked. The purpose of SRDI, however, is to provide a state-level picture – for regional/community level the authors would propose a 'basic health check' template using the same methodology as for SRDI but with fewer, easier to measure and simplistic indicators. Drawing from the experience of its members and the input from a variety of stakeholders involved in NRDP designation and implementation in CEE, CEEweb will continue the efforts to develop such a template in its future studies.

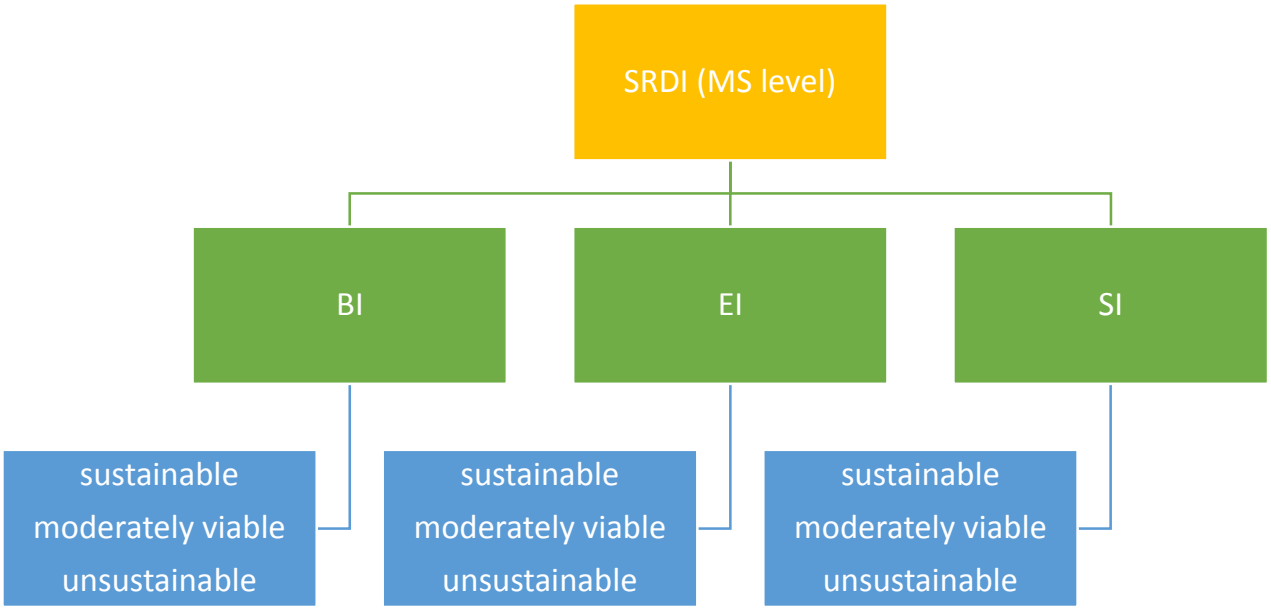

Fig.9) Structure of SRDI

The way forward

The SRDI would answer many questions and provide an honest assessment of NRDP and Pillar 1. However, there are many other questions to be answered about the index itself. First, it will need a careful review of its indicators and expert validation to ensure the final sample is relevant from a national perspective – SRDI should not disadvantage regions within a MS. Second, there is the question of whether all index indicators are weighted equally or not: are some indicators more important than others? If yes, how will this be reflected in the final

algorithm? Another challenge is to incorporate Pillar 1 into the monitoring system and SRDI. At the moment, most of the monitoring and evaluation is done for the NRDP measures of Pillar 1 despite the fact that Pillar 1 is responsible for around 70% of the current CAP budget. SRDI will have to accurately reflect the investments from Pillar 1 and perhaps the key in doing so will be in working more with the social and economic indexes rather than the biodiversity one, for which information is not yet available.

The purpose of SRDI is to indicate areas for improvement so that MS and the Commission can work together and direct most of the money to measures that would prove most supportive to the identified situation. Also, SRDI would be a simplified yet holistic evaluation of the agriculture sector at the national level and could prove an important tool to raise awareness amongst the general public. Ideally, the SRDI would be released each year and not after an MMF, in order to allow timely adjustment measures to take effect.

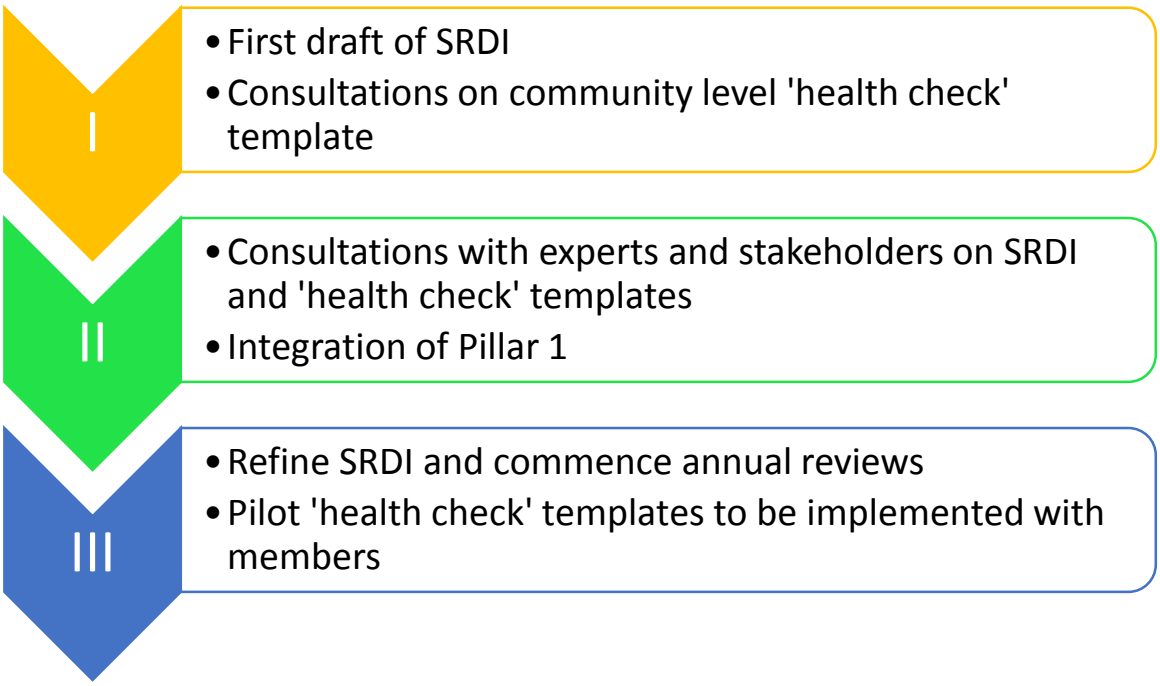

Fig.10) Next steps in developing SRDI

Conclusions

The CAP has historically been the single most expensive policy of the European Community and there are high expectations on its performance from a wide range of stakeholders – farmers, taxpayers, conservationists, corporations and policy makers, they all have various interests and ideas about how the CAP budget should be spent. Nevertheless, it is widely accepted that agriculture should play more than the sole role of food provision and its delivery of a variety of ecosystem services is crucial for the European society, environment and economy. Against this background, the Commission recognised the importance of agriculture in preserving biodiversity by including the sector in one of the six Biodiversity Targets to 2020. It also highlighted the need to preserve the genetic pool that exists in agriculture through a sustainable and balanced rural development.

Nevertheless, this study found that although it accounts for just short of 40% of the total EU budget, a very limited amount of this money goes to the preservation of biodiversity. For example, measures targeted specifically at the conservation of genetic resources for the period between 2007-2011 accounted to only 0.006% of the CAP budget and engaged only 0.05% of the total number of European farms. While other measures are directly or indirectly impacting on genetic diversity, it is on a worrying trend that target 3 of the Biodiversity Strategy is underfunded. The new reform of the CAP fell short of its initial 'green' commitments and so most of the measures directed at halting loss of biodiversity will depend on the way in which Member States are designing and implementing their National Rural Development Programmes. Last year's study from CEEweb found that at least in Central and Eastern Europe, it was difficult to assess the impact of NRDPs on biodiversity conservation and even more difficult to predict future scenarios. This was due to a number of factors, perhaps the most important being the poor monitoring and control systems, unrealistic designation of some RDP measures, a low degree of training and information access for farmers and poor integration of small scale farmers in RDP schemes.

The main argument in the previous chapters was that being able to assess the present state of biodiversity is essential and so is predicting future scenarios with a satisfactory degree of certainty. Despite the fact that at present there are a number of well developed indicators for biodiversity, sustainable development and agri-environment, the study showed that the monitoring method is inflexible and ignores the heterogeneity of European rural farmlands. At the same time, the current monitoring and assessment tools largely neglect Pillar 1 of the CAP – which concentrates most of the policy's budget – and overlooks the impact other sectors and policies have on farmland biodiversity and on the potential of agriculture to preserve its genetic pool. Finally, where in place, monitoring and evaluation processes tend to be carried out in parallel and independent to other factors that are directly impacting them. In other words, the assessments lack a State-Force-Response approach, which is exactly what this study advanced as a solution.

Establishing a Sustainable Rural Development Index (SRDI) is necessary for a number of reasons. First, recent years have seen a shift from 'conservation' to 'sustainable use' – this latter concept needs to be assessed and at present there is no integrated monitoring system in place. Second, SRDI would bring under the same algorithm indicators that are the driving

forces in rural Europe. Loss of biodiversity in European agriculture is caused on one hand by intensification taking place largely in Western Europe and on the other hand by land abandonment mostly in the new MSs. Both processes have socio-economic causes that need to be identified and addressed if measures such as green payments, Natura 2000 or Agri-environment Schemes are to be successful in the long term. Thirdly, SRDI would provide a timely evaluation for MS and RDP partnerships, ideally each year, so that policies can be better tailored and money for biodiversity more efficiently spent. Last but not least, SRDI does not come with new indicators and as such, does not require new resources and funding for monitoring – all its data is taken from already operational or soon to be operational indicators with information available at the EU level.

Finally, it is important that SRDI is accompanied by 'health checks' at farm/community levels, in order to provide accurate and useful feedback local and regional authorities and stakeholders responsible with the implementation of NRDPs. The 'health checks' should be in the form of a very basic and simplified template, following the same methodology as SRDI but in a more basic form, in order to be accessible on the ground and provide a faster feedback at a local and regional level. Both SRDI and the 'health check' templates need more algorithmical development and pilot projects for testing and fine-tuning – however, once operational, both tools will inform in an accurate and valuable way not only the EU bodies and MS but also the general public on the progress towards 2020 targets and the role agriculture plays in preserving Europe's genetic pool.

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