Annex: Concept Note

Towards a new public goods payment model for remunerating farmers under the CAP Post-2020

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1. Background

Agriculture is highly dependent on our environment and natural resources to produce private goods for the market (e.g. farm produce) and public goods (PGs) for society (e.g. soil fertility, biodiversity). However, farmers are largely confronted by the need to maximise their price competitiveness for the private goods they produce in an increasingly globalised food system. Thus, there is often an insufficient economic motivation for farmers to provide PGs, demonstrating the failure of the market to adequately value the provision of such goods and services.

The 2013 reform of the Common Agricultural Policy (CAP) for the 2014–2020 period aimed to be a flagship initiative for the delivery of more environmental and climate friendly agriculture, encapsulated in the slogan "*public money for public goods*". To deliver more PGs from EU agriculture was considered essential to justify the CAP budget. This was reflected in the reform's priority areas which included viable food production, sustainable management of natural resources, and balanced territorial development throughout the EU (European Commission, 2013b).

PGs associated with agriculture include the provision of environmental and social goods such as farmland biodiversity and animal welfare which cannot be adequately supplied through functioning markets. Under the CAP reform the PGs agenda was primarily focused on the integration of environmental concerns into the CAP. This was based on a distinction between, firstly, ensuring a sustainable way of farming by avoiding environmentally harmful agricultural activity and, secondly, providing incentives for environmentally beneficial public goods and services (European Commission, 2015).

To this end, the reform sought to use both Pillar 1 (direct payments and market measures) and Pillar 2 (Rural Development Programmes - RDPs) to provide more PGs from EU agriculture through a combination of mandatory and voluntary single target measures applicable to farms in receipt of CAP payments. In addition, organic farming was explicitly recognised under both Pillars for the first time in terms of its contribution to PGs, with organic farms automatically eligible greening payments under Pillar 1 and a dedicated measure under Pillar 2 for organic farming payments (conversion and maintenance). However, the final reform also resulted in many questionable exemptions for mandatory

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measures and a reduction in funding for voluntary measures which are generally more ambitious (Hart 2015a, 2015b).

Since almost 40% of the EU's Multiannual Financial Framework (MFF) 2014-2020 (EU budget) goes to the CAP, the decisions made about which farming systems and practices to promote, directly shape the kind of food system we have in the EU. Although the CAP has begun to move slowly in a more sustainable direction over the last two decades, through the introduction of specific reform objectives, it remains primarily orientated towards the international trade agenda. Roughly 70-80% of the CAP budget goes to area-based direct payments and a significant proportion of these payments lead to inflated land values and the promotion of further intensification. Still only 20-30% of the total CAP budget is directed towards environmental and climate action while a mere 1.5% is targeted at investments in sustainable organic farming systems (Stolze *et al.*, 2016).

Most these environmental payments are also area-based and are calculated on the grounds of income forgone and costs incurred. There is often insufficient economic incentive for farmers to take up these measures in a systematic way. Thus, the development of more sustainable food and farming systems using the CAP remains an add-on rather than a central part of the policy. With these realities, there is huge potential to use the next CAP reform for the Post-2020 period to better incentivise and reward environmental, and also other societal services delivered by farmers. Such an approach should aim at fully reconciling farm incomes with the delivery of both private goods for the market and PGs for society.

At EU level discussions on the next CAP reform Post-2020 have already begun, with the European Commission launching a public consultation in February 2017. Its aims to understand stakeholder views on the CAP and to take them into account in the further development of the policy. The results of the consultation will feed into an impact assessment on the future of CAP culminating in a Communication on the next reform expected (European Commission, 2017). The consultation follows the adoption of the *Cork 2.0 Declaration "A Better Life in Rural Areas"* in September 2016 calling for an innovative, integrated and inclusive EU rural and agricultural policy guided by ten policy orientations from promoting rural prosperity and managing natural resources to encouraging climate action and improving performance and accountability. In the Declaration both policymakers and stakeholders from across of EU reaffirmed the need for public policy to incentivise and reward the delivery of environmental PGs and services, taking account the diversity of local contexts within the Union (European Union, 2016). In this backdrop organisations such as IFOAM EU - the International Federation of Organic Agriculture Movements EU (IFOAM EU Group, 2017) and DVL - German Association for Landcare (Dierking *et al.*, 2016), along with several other interest groups, has been suggesting alternative concepts for how the CAP payments could be made more effective in delivering PGs.

Parallel to and within the public policy debate on the future of the CAP, the terms "sustainable development", "sustainability" and "sustainable agriculture have gained a substantial importance. Since the concept of sustainable development has been proposed as

a fundamental principle for policymakers (WCED, 1987), the Millennium Goals and their successors, the Sustainable Development Goals (SDGs) have been developed (Griggs *et al.*, 2013). Frameworks for measuring sustainability in agriculture and the food sector have been helping to define what sustainable agriculture and food provision encompasses (FAO, 2014).

An increasing number of sustainability assessment tools have been and continue to be developed. Particularly at farm level, tools such as RISE, SMART, IDEA, OCIS PG-Tool etc. assess to what extent farms meet the ideal of sustainability according to specific criteria. The tools have been used predominantly in either research or private sector contexts (Schader *et al.*, 2014a; Wustenberghs *et al.*, 2015). They commonly address all the dimensions of sustainability (Environmental, Social and Economic) and measure to what extent the farm is managed in a sustainable way by means of indicators. These tools do not prescribe a particular way to achieve sustainability and therefore give more freedom to the farmer than the current agri-environmental or other policy measures do. This may provide an incentive for the farmer to become innovative and improve their opportunities for action. However, so far there has been limited exploration of how these sustainability assessment approaches could be used to develop simple, measurable and accessible payment models for remunerating PG delivery as part of a farm's overall business.

The aim of this concept note is to review and assess existing literature, studies and concepts on the effectiveness of the current CAP to public good delivery in food and farming with a critical view on the methodology and outstanding research questions arising from these studies.

2. State-of-the-art

The use of the CAP to support PGs provision in EU agriculture has primarily focused on the delivery of environmental services through a range of different payments largely area-based. Under the 2013 reform existing PGs payments were complemented by new instruments. The CAP now includes on the one hand a basic set of generic measures in the form of greening payments under Pillar 1, which are 100% financed by the EU and are in principle compulsory for all farmers in receipt of direct payments. On the other hand, more targeted and measure specific payments offered under Pillar 2 RDPs – chiefly agri-environment-climate (Measure 10) and organic farming (Measure 11) – are voluntary instruments that farmers can adopt and are co-financed by both EU and Member States [3] (European Union, 2013b, a).

Although these types of payments have been the main instrument used to support the delivery of PGs under Pillar 2, assessments of previous RDPs show that other measures may also partially target (e.g. training and advice) or indirectly support (e.g. farm diversification) environmental services (Cooper *et al.*, 2009). Other measures also give Member States the possibility to support a combination of environment and animal welfare services e.g.

[3] These payments tend to be - orientated mainly towards single environmental objectives (e.g. agri-environment-climate) and multiple environmental and animal welfare objectives (e.g. organic farming). Maximum Co-financing rates up 75% also apply to specific measure contributing to the objectives of environment and climate change mitigation and adaptation in all regions.

organic farming (Sanders, 2013). However, as most Pillar 2 measures are optional for Member States to implement their impact across the EU remains limited. Animal welfare (Measure 16), for example is offered in just 30 out of 118 RDPs for the period 2014-2020 (Baldock and Mottershead, 2017). Given the historical focus on the environment under successive CAP reforms since the 1990s, and renewed emphasis on the sustainable management of natural resources under the 2013 reform, the effectiveness of new and existing instruments to support farmers delivering environmental PGs is explored in more detail below.

Effectiveness of the Pillar I Greening component to deliver PGs

The 2013 CAP reform introduced a new instrument under Pillar 1 - the Greening component. The initial aim of the Greening component is to make the EU direct payment system more environmentally friendly and thus to "provide a basic level of environmental management" from all farms supported under the CAP (Hart, 2015b). It seeks to support farmers that adopt or maintain agricultural practices that help to meet EU climate and environment goals by respecting three generic obligatory agricultural practices (European Commission, 2013a):

1. Maintenance of permanent grassland
2. Dedicating 5% of arable land to Ecological Focus Areas (EFAs)
3. Crop diversification

Although it is still too early to assess the overall impact of the Greening component, one outcome has already emerged in that it has the potential to induce and encourage system thinking as one approach to fostering a greener and more environmentally friendly EU agriculture. Big arable farms, for example, are now required to implement at least a few minimal greening practices, which can be seen as a step towards more sustainable agricultural practices and could lead to increased catch crops, crop diversification, maintenance of permanent grassland and the creation of EFAs. However, Member States have a lot of flexibility regarding the implementation of specific greening measures. Member States, for instance, can replace one or more greening requirements through equivalent practices.

The basic dilemma is that environmental measures under Pillar 1, which apply to all farmers in EU Member States, require easy administration and control. As a consequence of this, and the fact that Pillar 1 greening measures cannot be targeted to the same extent as Pillar 2 measures, Forstner *et al.* (2012) expect provision of PGs at high costs and thus inefficient use of taxpayer's (problem of deadweight losses).

Various ex-ante assessments consider that the Greening component will have limited impact due to a lack of adaptation to local characteristics (Westhoek *et al.*, 2013; Hauck *et al.*, 2014; Wąs *et al.*, 2014). The changes in crop diversity, share of ecological focus areas, and size of permanent grasslands, for example, highly depend on site conditions, farm intensity and farming system.

According to Hauck *et al.* (2014), the impact of set aside EFAs largely depends on the management of these set aside areas, their integration into the crop rotation and the extent

of soil cover. Especially on extensively managed agricultural areas, greening measures will only have limited impacts (Wąs *et al.*, 2014). The huge variety of ecosystems, ecological problems, and farming systems across the EU together with a rather unspecific design and limited portfolio of greening measures will in many regions mean that positive effects are unlikely from EFAs (Hauck *et al.*, 2014).

As to the crop diversification measures, most arable farmers already grow three crops or more. Thus, only 2% of EU arable areas will be impacted by the measure (Westhoek *et al.*, 2012). In some Member States, the greening is implemented in way that farmers will be able to meet the greening requirements by only making a few changes (Hart, 2015b). Therefore, greening measures may only prevent further environmental degradation rather than leading to the provision of more PGs (Wąs *et al.*, 2014).

Moreover, there has been a dilution of ambition. EFAs, for example, were considered the measure that could bring the most environmental benefit (Hart, 2015a). However, during the negotiation process, the environmental specifications were diluted by reducing the share of EFAs from 7% to 5%, and allowing exceptions such as area thresholds, which exempt around 88% of EU farmers and more than 48% of the agricultural area from deploying EFAs (Pe'er *et al.*, 2014). Finally, quite a lot of farms are exempt from the greening obligations. Small farms, area thresholds and EFA exemptions lead to a situation in which both the agricultural land area and the number of farms affected by the greening will be rather low. In some Member States, such as Italy, such exemptions apply to a considerable number of farmers (Hart, 2015b)[4].

Effectiveness of Pillar 2 agri-environmental measures to deliver PGs

The 2013 reform maintained the requirement for all Member States to offer agri-environment-climate schemes (Measure 10) under their Pillar 2 RDPs. The RDPs, administered and implemented at either national or regional level, also offer other measures classified as contributing to environmental objectives. These include organic farming (Measure 11) and Natura 2000/Water Framework Directive payments (Measure 12) amongst others. [5]

In contrast to Pillar 1 greening several studies have analysed the environmental effects of implemented agri-environmental measures (AEMs) over the past decades. A review by Batáry *et al.* (2015) concludes that different critical factors influence the effectiveness of AEMs. For instance, they find a strong geographical bias of studies towards intensively

4 In contrast to most exceptions and exemptions, the intervention logic to make organic farmers automatically eligible to receive the greening component payment is due to the recognition that their practices are shown to provide a clear ecological benefit European Commission, 2013a. Memo- CAP Reform – an explanation of the main elements. In: Commission, E. (Ed.). European Commission, Brussels.

5 Agri-environmental measures have been part of the agricultural EU policy toolbox since the mid-1980s, becoming a compulsory part of the CAP in 1992, as part of reforms to move away from production based support towards producer support and considerations for the environment. Prior to the 2013 reform they have evolved to be the main mechanism to support public good provision including action on Climate Change.

farmed areas in the North and the West of Europe. Newer EU Member States in Eastern Europe carried over AEM designs from the old Member States which were initially designed for intensively used agricultural areas whereas they implemented these AEMs on extensive agricultural land. The outcome was that these AEMs were ineffective or even had negative effects on the extensively farmed land. Thus, to be effective, AEMs need to be adapted to the local situation and context. Further, the meta-analysis found AEMs implemented on "in production areas" (e.g. arable land, grassland) are less effective to enhance species richness than AEMs implemented on "out of production areas" (e.g. hedgerows, field boundaries) (Batáry *et al.*, 2015). Although AEMs change substantially with every policy period (every 7 years) and novel scientific insights are considered, no increase in the effectiveness between AEMs implemented before or after 2007 was found (Batáry *et al.*, 2015). However, a high level of effectiveness also requires a high acceptance by farmers, i.e. a high level of adoption. Obviously, this is a challenging task. Hodge and Reader (2010) show that AEMs with a high level of uptake and which require little change in management are not the most effective AEMs in enhancing biodiversity.

To justify policy decisions, policy makers are increasingly urged to provide evidence that the implemented AEMs financed by public spending achieve the environmental targets set (Pacini *et al.*, 2015). Since efficiency is difficult to evaluate without comparable policy options for the desired goal achievement, the effectiveness can be measured on the basis of the ecological or environmental outcomes (Meyer *et al.*, 2015). Additionally to efficiency and effectiveness, policymakers need to consider following aspects when designing AEMs: a) society's environmental objectives, b) acceptance by farmers and other interest groups (Pacini *et al.*, 2015), and c) conformity with international trade rules (WTO). Agricultural products and PGs are often jointly produced. However if not decoupled, this concept of multifunctionality bears the risk that farmers' remuneration for the provision of PGs is used to conceal income support (Westhoek *et al.*, 2013).

In general, the provision of PGs can be stimulated via a set of different policy measures, e.g. regulations, taxation of unwanted effects, auctioning measures or measures which increase investments in education, research and extension services. However, the obvious first and best solution for such a stimulation are targeted decoupled payments (Westhoek *et al.*, 2013). Effective agri-environmental measures, for example, need to (Meyer *et al.*, 2015; Pacini *et al.*, 2015):

- be based on a results-oriented approach,
- allow for comparison of alternative land use options in terms of resource use efficiency
- be compatible and consistent with changes in other policy measures,
- consider heterogeneous contexts of EU rural environments
- provide an accessible advisory and extension system.

Implementation should consider flexible application procedures and the mandatory participation of a nature conservation agency (Meyer *et al.*, 2015). Furthermore, AEMs targeted to one environmental objective in combination with multi-targeted whole farm approaches, like organic farming, qualify as effective solutions for AEMs (Schader *et al.*,

2013; Schader *et al.*, 2014b; Meyer *et al.*, 2015). Combining organic support payments with other agri-environment payments can also utilise the comparative advantages of organic farms in providing environmental benefits and public goods (Sanders, 2013).

CAP budget allocation

Despite the greater emphasis placed on PGs over successive CAP reforms, almost two-thirds of the CAP budget allocation is devoted to policy goals that are neither aligned to improving agricultural sustainability nor which include basic sustainability criteria. Where PGs are supported under Pillar 1 and 2 the current CAP budgetary framework has differing and often incompatible and incoherent mechanisms, which may act as a constraint for farmers aiming to make sustainable farm management decisions. The ability to shift money from one pillar to the other and inconsistencies in co-financing between Member States supporting PGs delivery have together resulted in a non-transparent, complicated and suboptimal solution for achieving EU environment and climate goals which deserves scrutiny (Buckwell, 2015; Stolze *et al.*, 2016). Maintaining the two CAP pillars with their different funding has inhibited the delivery of rural development by the expansion of compatible systems, with different policy objectives under both Pillar 1 and 2 often completing with each other, impeding the transition of the EU towards more sustainable agri-food systems. Competition between these pillars for budget resources is expected to increase, whilst at the same time, competition between the various objectives of the CAP is likely to continue (Burrell, 2009; Buckwell, 2015). Furthermore, the European Commission has indicated its intensions, in the context of the mid-term review of the MFF 2014-2020 and EU budget Post-2020, to make all EU spending more results orientated to ensure resources are prioritised for actions that deliver high performance and added value (European Commission, 2016a). Based on these developments it might be worth trying to overcome the boundaries of this funding framework and transitioning to a system that allocates budgets to specific single or multiple objectives (Schader *et al.*, 2014b). This would allow for the development of a consistent programme of environment and climate outcomes – without compromises – under the objective and budget for "Green EU Agriculture" (Stolze *et al.*, 2016).

3. Potential of result-orientated and action-orientated measures to support effective public good delivery

Environmental PGs delivery is usually tackled using so called 'input-' or 'action-oriented' agri-environmental measures prescribing specific management actions which need to be implemented to receive the payments (Schwarz *et al.*, 2008; Burton and Schwarz, 2013; Nitsch *et al.*, 2014). Even though management prescriptions ought to be closely linked to a specific desired outcome, such prescriptions have not led to the desired results. Solid evidence about the effectiveness of the prescriptions included in the measures was lacking when the options were designed. In the case of measures for biodiversity, action-oriented measures have been shown to slow down the loss but they have not succeeded in stopping the decline of endangered species (Kleijn *et al.*, 2006). Similar results can be found in the case of action-oriented programmes in drinking water catchments (Wezel *et al.*, 2015). The reasons are, first of all, that farmers are incentivized to participate but not necessarily to actually achieve success (Hampicke, 2013). Second, there is little evidence that these action-oriented measures induce long-term attitudinal and cultural change among farmers (Schenk *et al.*, 2007; Burton and Schwarz, 2013). Furthermore, there is in many cases a missing link between agri-environmental measures and the environmental pressures which makes it difficult to track the results (European Court of Auditors, 2011).

More recent piloting of result-oriented measures show significant potential to improve the overall effectiveness. Agri-environmental measures, for example, are defined as 'result-oriented' if they are directly bound to the outcome of a desired ecosystem good or service (Derissen and Quaas, 2013; Keenleyside *et al.*, 2014). Several authors consider result-oriented measures as an approach to overcome these problems (Schwarz *et al.*, 2008; Sabatier *et al.*, 2012; Burton and Schwarz, 2013; Fleury *et al.*, 2015; Stolze *et al.*, 2015; Wezel *et al.*, 2015) as they:

- directly link payment provision to the environmental outcome,
- align payment levels to the corresponding environmental outcome,
- can be adapted specifically to the site conditions,
- allow farmers to decide how to achieve the desired outcome best.

Result-oriented measures have been implemented in several European countries to achieve biodiversity, nitrogen surplus or water quality goals although in most of the cases result-oriented measures address biodiversity e.g. by proving the existence of defined indicator species on grassland or the occurrence of nests of ground-breeding birds (Keenleyside *et al.*, 2014; Nitsch *et al.*, 2014; Stolze *et al.*, 2015; Wezel *et al.*, 2015). Despite the fact that result-oriented measures are perceived to be a more effective means to achieve environmental goals, so far evidence from scientific literature is scarce. Wezel *et al.* (2015) analysed the case of a result-oriented water catchment programme in Germany: Based on annual randomly taken soil samples from contracted and non-contracted farm plots in the water catchment area a reference N-concentration in the soil is determined. Farmers participating in the programme receive only payments if the N-concentration in samples taken from their contracted plots is lower than this reference value. This result-oriented approach led to a significantly reduction of the nitrate concentration in this water catchment area (Wezel *et al.*,

2015). However, administration and monitoring of such result-oriented measures can involve high transaction costs (Burton and Schwarz, 2013). Finally, using results-oriented agri-environmental measures requires robust monitoring and evaluation evidence of the successful implementation and cost-effectiveness of results-oriented schemes. However, these monitoring and evaluation systems need to provide evidence whether the environmental goal has been achieved and not only a result indicator (Keenleyside *et al.*, 2014; Stolze *et al.*, 2015).

While such result-oriented schemes have not been implemented in a scalable form, there are several approaches that try to bridge the gap between a pure practice-based instrument and a result-based instrument. Such approaches include the *Ökopunkte*-System in *Niederösterreich* (www.oekopunkte.at) under the Austrian Rural Development Programme 2007-2013 (Bundesministerium für Land- und Forstwirtschaft Umwelt und Wasserwirtschaft (BMLFUW), n.d.), but also the *Gemeinwohlprämie* (Public Goods Bonus) piloted in the German region of Schleswig-Holstein (Dierking *et al.*, 2016).

4. Evaluation of existing sustainability assessment tools for providing evidence of public good delivery

Since the Sustainable Development Goals (SDGs) were adopted in 2015, the notion of sustainability has received an even greater push in the public policy debate. The European Commission, including its in-house think tank the European Political Strategy Centre (EPSC) has also acknowledged the importance of the CAP reform Post-2020 in contributing to SDG 2 ("End hunger, achieve food security and improved nutrition and promote sustainable agriculture"), but agriculture also has an intrinsic link to issues such as jobs, food, air, climate change, water, soil and biodiversity (relevant to SDGs 8, 12, 6, 13 and 15) (European Commission, 2016b). Furthermore the European Political Strategy Centre (EPSC) goes further in arguing for the SDGs to be part of fundamental re-think of the CAP, highlighting the merits of organic and agro-ecological approaches for building integrated farming systems thereby contributing to a transformative policy Post-2020 (Falkenberg, 2016). Although agriculture and rural development play an important part in the SDGs, tangible indicators are needed (Hák *et al.*, 2016). Furthermore, although the implementation of SDGs is being defined and monitored at both global, EU, national and regional levels (Eurostat, 2016) it is conceptually difficult to break down all relevant indicators to the scope of an individual farm.

As a concept for agriculture, the Guidelines for Sustainability Assessment for Food and Agriculture Systems (SAFA) offer a more tangible approach (FAO, 2014). A set of 58 themes has been defined by the Food and Agriculture Organization of the United Nations (FAO). This concept includes governance as a fourth sustainability dimension, which fosters the goal achievement in the environmental, social and economic dimension (Figure 1). Such a multi-dimensional framework is important as many farming practices not only differ in terms of provision of environmental goods and services but also contribute more or less to rural development. For instance, organic farming has been shown to contribute to rural employment in Ireland and the UK (Morison *et al.*, 2005). However, evidence in this area is

limited and needs to be further explored. Sustainability assessment frameworks can be helpful in the policy context in order to encompass both social and environmental policy goals in a common framework. Schader *et al.* (2014b) have shown that such a single framework is important, especially if it comes to the evaluation of multi-target policies such as the support payments for organic farming.

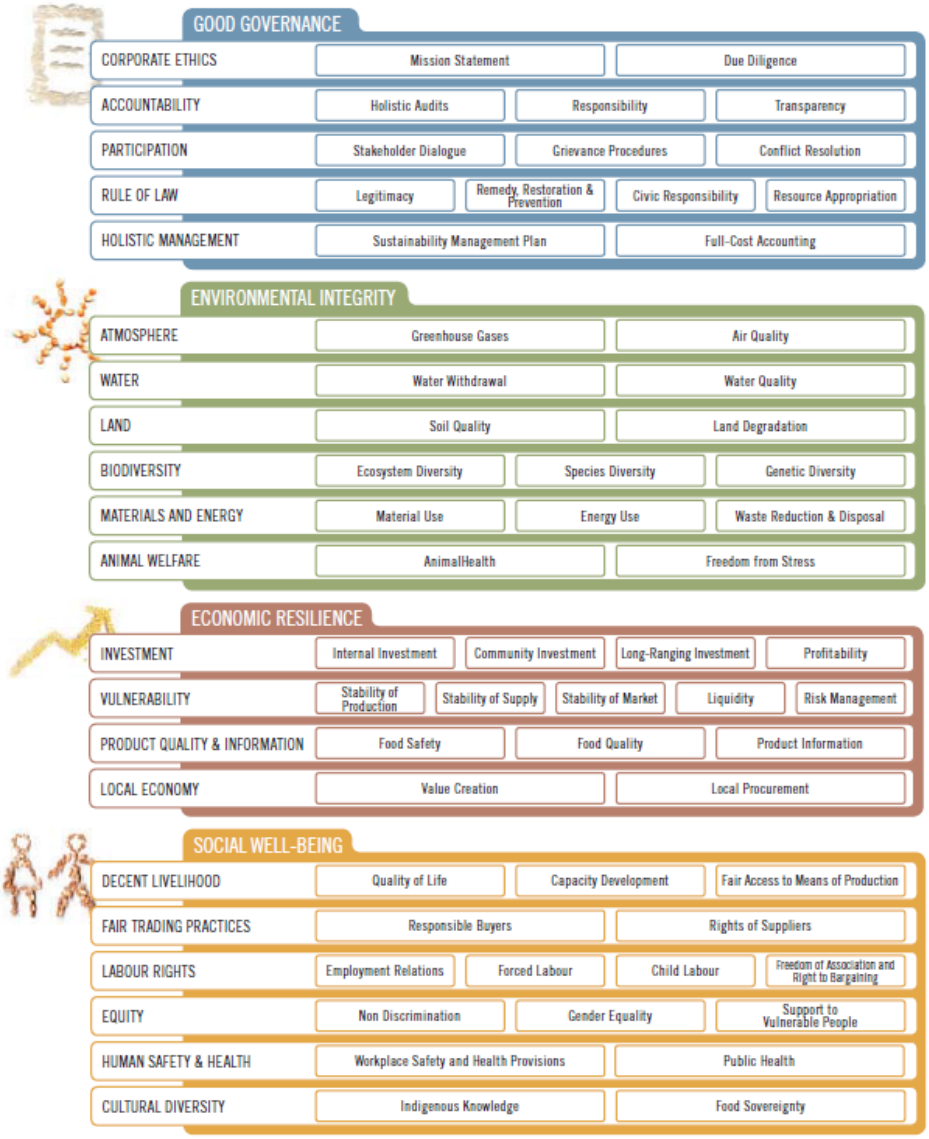

Figure 1: Overview of the dimension themes and subthemes included in the notion of sustainable agriculture and food systems (FAO, 2014)

There are a large number of different approaches for assessing sustainability of agricultural systems (Schader *et al.*, 2014a; Wustenberghs *et al.*, 2015). Schader *et al.* (2014a) classified the approaches according to several criteria (Table 1). First and foremost, the primary purpose a tool was developed for, needs to be considered when evaluating and comparing the tools.

There are tools for pure research purposes, which take a large amount of time for data collection on farm (e.g. REPRO (Hülsbergen, 2003), SALCA (Bockstaller *et al.*, 2006). Most of these tools are based on a life cycle assessment framework and work quantitatively. This allows a sound comparison of different farms. Other tools are focussed on providing farm extension (e.g. RISE (Grenz *et al.*, 2009), PG-Tool (Gerrard *et al.*, 2011) and do not aim at comparability across regions and farm types. Further tools focus on cross-region and cross-farm type comparability and try to limit the time required for data collection to a minimum (Zahm *et al.*, 2008; Schader *et al.*, 2016). However, these tools are semi-quantitative as they are based on a multi-criteria assessment framework (Dodgson *et al.*, 2001), and are not necessarily suitable for extension services, if they do not employ a didactic strategy.

Table 1: Classification of sustainability assessment tools

Characteristic	Classes
Primary purpose	• Research • Advisory service • Supplier assessment • Certification • Monitoring • Policy advice
Level of assessment	• Farm level • Product / supply chain level • Agricultural sector level
Dimensions of sustainability covered	• Environmental • Social • Economic
Geographical scope	• Applicable globally, applicable to a specific country or region
Sector scope	• Applicable to all agricultural/food products or farm types • Applicable to specific product or farm types
Perspective on sustainability	• Farm/business perspective (is the company economically healthy and developing on a resilient pathway?) • Societal perspective (does the company contribute to sustainable development of society?) • Mixed perspective (farm/business perspective and societal perspective are mixed)

Source: Schader *et al.* (2014a)

Some tools concentrate on single dimensions of sustainability (mostly the environmental dimension). Others cover the three dimensions of sustainability according to WCED (1987): the environmental, social and economic dimension. With respect to the level of assessment, farm-level sustainability assessment tools are at the centre of the discussion with respect to the allocation of public money.

Sustainability assessment tools often employ both a farmer's perspective and a societal perspective. A farmer's perspective asks whether the farm is sustainable in the sense of resilience, i.e. can it economically survive, even if economic, environmental or social issues change? In contrast to this, the societal perspective on sustainability asks rather for the farmer's delivery of PGs to society. Since some of the themes which are subsumed in sustainability partly employ a farmer's and partly a societal perspective most sustainability tools employ a mixed perspective. In the policy context, the delivery of PGs to society needs to be the central paradigm for indicator development, if the aim is to allocate public money to farms, based on the assessment.

The geographical and sectoral coverage of tools to be used in a European policy context needs to be wide. Approaches need to cover at least all relevant conditions and farm types in a region or Member State, depending on whether such a system will be implemented at national or EU level.

A different approach to using on-farm sustainability tools is extending existing databases such as the Integrated Administration and Control System (IACS) to take account of sustainability indicators or to use the Farm Accountancy Data Network (FADN) as a sample survey to judge sustainability outcomes in a more general sense. The EU Agri-Environmental Indicators (AEIs), launched to track and monitor the integration of environmental concerns into the CAP at EU, national and regional levels (Commission of the European Communities, 2006) should also be further explored. Such approach seem to be more promising in terms of cost-effectiveness.

However, assessments which are based on farmers' self-declaration may result in biases, lack accuracy and accountability. Furthermore, farmers would require training for specifying indicators which are not straightforward to evaluate. In particular if the data which farmers provide will determine the payment levels, an independent audit will be required (Vrolijk *et al.*, 2016).

Since all the tools are developed for different purposes and in different contexts, a heterogeneity of approaches is justified. However, none of the current approaches are able to be applied to practically measure sustainability in the policy context. There is no one-size-fits-all solution for sustainability assessment, but there are different trade-offs between the several requirements such an approach would have to fulfil in a policy context.

5. Potential of sustainability assessment tools for enhancing CAP effectiveness and efficiency

Sustainability assessment tools could help enhance the effectiveness, efficiency and the acceptability of agricultural policy for farmers and society by bridging the gap between action-oriented (based on prescribed practices) and results-oriented measures (payment bound directly to a defined outcome on each farm). Farmers would then be paid based on the results they achieved in realising different policy goals addressing sustainability. To which degree the goals are achievement by a farm would be determined by using an indicator-based sustainability assessment tool. Such an approach would have three main advantages:

First, it would lead to a simplified monitoring and control system as compared to results-oriented payments, because one would not require to collect data on the actual results achieved but only the input data for the sustainability assessment. This is less time consuming as some of the tools are tailored towards efficient and verifiable data collection. Second, such an approach would allow farmers to be similarly flexible and innovative than in a results-oriented approach, as farmers would not only pick from a limited number of different agri-environmental payments but have a large number of options for improving the sustainability performance of their farm in a way that is appropriate for the specific farm.

In this context, sustainability assessment tools could be used in two principal ways (Figure 2):

1. For the monitoring and verification of the farms' sustainability performances and for allocating of payments accordingly.
2. For capacity building of farmers in order to understand and continuously improve their sustainability performance in a way tailored to their individual farm context.

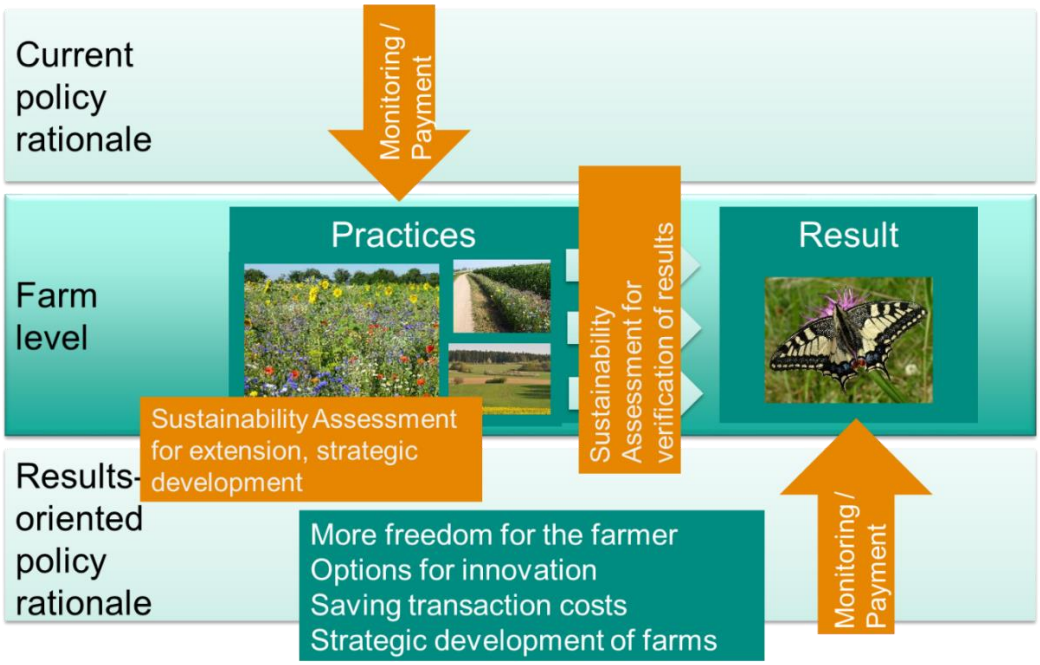

Figure 2: Entry points for sustainability assessment tools into agricultural policy

Opportunities, challenges and risks of introducing a new PGs payment model

This concept presents significant opportunities to make use of the benefits of results-oriented approaches, such as making use of the potential for innovation by farmers, motivating farmers, fair remuneration and context specific adaptation. At the same time, the advantages of action-oriented approaches, based on prescription of practices, would enable easy monitoring and control. This would help provide a fair remuneration to farmers, who meanwhile provide PGs and other services to society. This would also help to decrease undesired spill-over effects of CAP payments towards land owners or purchases of agricultural products. Furthermore, farmers would be free to decide specifically the overall portfolio of food and societal services they would like to provide, whether to markets or to society.

Nevertheless, the specific implementation of such a concept does present certain challenges. First, the indicators used in a sustainability assessment tool need to be robust and valid. Thus, the indicators to be used need to be supported by and based on sound scientific evidence. There are quite a body of indicators for which this scientific evidence is already available. But there for others, there is a need for review and research to provide this evidence for the link between farm practices and the corresponding impact on sustainability.

Second, notably the need to consider the specific ecological and socio-cultural contexts of different Member States in building a common framework with enough space for considering regional and local specificities. Furthermore, some concepts with respect to sustainable agriculture are subjective and normative. Current sustainability assessment tools have a wide range of different approaches for calculating the degree of goal

achievements by farms. Especially with respect to socio-economic goals, crucial conceptual questions have not been solved. Reaching broad consensus among stakeholders and experts with respect to relevant algorithms will be critical.

As with any new approach, there are risks associated with such a new payment system. While the direct impacts on single farms can be modelled, unexpected impacts at agricultural sector level may occur. For instance, the markets for agricultural produce may be affected, resulting in higher food prices – potentially increasing the quantity of imports from countries with different standards and requirements. Furthermore, some farmers will be negatively affected by this change of the CAP payment model and so it can be expected that those farmers will oppose the new system. This bears the danger of the concept being watered-down by different stakeholder groups who may believe they have an interest in maintaining the status quo.

6. Conclusions

From the review of scientific literature, we conclude that further work is need to fully conceptualise a new model to monitor, evaluate and remunerate farmers' provision of PGs as an integrated part of the CAP. The research gaps with respect to the effectiveness and efficiency of PGs and services provision under the EU Policy framework of the CAP which require further exploration to conceptualise a new payment approach include:

- That Pillar 1 and 2 measures intended to deliver more PGs for society are neither effective nor efficient. There is a lack of developed concepts of how the effectiveness could be increased of agri-environmental measures and other policy instruments targeted at socio-economic issues.
- So far, the vast majority of studies have focused on environmental PGs and services delivered by farms to society. Socio-economic services in the context of the debate on PGs delivery remain an underdeveloped area. The economic concept of PGs is only partly applicable to these aspects as many of these services (e.g. rural employment) do not qualify for the principle of non-excludability nor to the concept on non-rivalry.
- Result-oriented schemes are considered as a means to increase effectiveness of agri-environmental measures, but the scientific evidence is scarce beyond its current dominant use for biodiversity conservation measures. However, these approaches need to be developed further and there is a need to evaluate whether the transaction costs, which can be substantial, are justified by the increased effectiveness of the measure and whether the approach can be developed for other policy goals beyond biodiversity conservation measures. Lessons should also be drawn from the experience of current and previous programming period concerning single and multi-target 'action-oriented' measures.
- Improving effectiveness of policies and the justification of public money invested for agri-environment and climate change measures requires robust monitoring and evaluation on the basis of the ecological or environmental outcomes. However, linking the farmers' provision of PGs to payments will require monitoring on farm or

on plot level. It is necessary to evaluate whether the EU Agri-Environmental Indicators could be used for farm level mapping and monitoring.

- Furthermore, insights from specific farm-level indicator sets to measure provision of PGs (e.g. Repro, SMART) should be evaluated as to the extent to which elements of such indicator sets could complement the EU monitoring system, including the EU Agri-Environmental Indicators and the CAP Integrated Administration and Control System (IACS). However, this will require a generic approach to ensure comparability between farms of different types in different regions.
- Scientific literature highlights the importance of training and advice to increase the effectiveness of agri-environmental measures. Indeed, to make further progress, the provision of financial incentives for public good provision must be complemented by other support measures, including advisory and extension services. Farmers need to be aware of what practices and options they can use to improve their overall sustainability. So far, only limited research is available on what instruments (e.g. whether based on RISE or the PG-Tool) would be required so that agri-environmental measures could go hand in hand with farm strategy development. More specifically, it is necessary to enable how can farmers to monitor their environmental, economic and social performance and thus set targets for their continuous improvement in providing PGs to society.
- Governance structures for a system leading to a more integrated CAP have not been explored. Currently, the command-and-control driven approach of more widespread "light green" agri-environmental payments are administered separately from farm advisory and extension services, whereas less common "dark green" payments tend to be more customised with dedicated services available to them. New governance structures that facilitate easily administered, controllable and verifiable PGs payments and are complemented by farm advisory and extension services to ensure an integrated approach need further consideration. This should include the exploration of such structures in different national and regional contexts.

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