UNISECO

UNDERSTANDING & IMPROVING THE SUSTAINABILITY OF AGRO-ECOLOGICAL FARMING SYSTEMS IN THE EU

Deliverable Report D5.3
Annex 1 - Case Study Summaries

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CASE STUDY SUMMARIES

Deliverable D5.3 reports on the participatory assessment of the potential of existing market and policy instruments (MPIs) to support agro-ecological transitions in the UNISECO partner countries. This document (Annex 1 of Deliverable D5.3) provides a brief summary of the participatory assessment of MPIs done in each case study. All the information from the assessment carried out in each case study has been homogenized in summaries that include a description of the type of participatory approach followed (workshop option), dilemma, key barriers and drivers, main MPIs, synthesis of the barometer exercise, how instruments relate to drivers and barriers, effectiveness of MPIs, and lessons learned.

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1. MITIGATION OF CLIMATE CHANGE BY HUMUS FORMATION IN ARABLE FARMING (ÖKOREGION KAINDORF, AUSTRIA)

Data collection method: Workshop Option B reduced
Duration of the workshop: 2.5 hours
Number and profile of participants: 6 participants from NGOs, civic society organisations, local community representatives (2), Farmers and farmers 'associations (3) and Authorities and administration (1)

Key dilemma

How to tackle climate change impacts (e.g. increasing water stress), increase carbon sequestration in soils, prevent soil degradation and reduce soil fertility loss from arable land whilst maintaining or improving the farm's social and economic sustainability and contributing to climate change mitigation?

General overview of Drivers and Barriers

A barrier to successful carbon sequestration is insufficient knowledge of the soil and humus system amongst farmers, which have led to innovation scepticism. Despite many activities to counter this, scepticism and lack of knowledge are still a barrier. For example, a municipality in the CA area is refunding the costs of soil analysis to farmers and provides financial support for attending to humus-formation training. This driver has still a reduced application at the territorial level. The big economic pressure and investments keep the farmers in the position they are in and the willingness to try something new is low. Climate change dynamics and impacts are increasing in the case study area, boosting actor concerns and the call for financial and knowledge building support about climate change adaptation interventions. However, formal education institutions have missed any focus on AE so far, thereby acting as barriers to knowledge diffusion about AE. The representatives and advisors of the Chamber of Agriculture, who previously worked against the project, are now supporting it and this behavioural shift acted ad as driver.

Analysis of MPIs

The preparatory desk research for the barometer workshop allowed the identification of 19 MPIs. Figure A1 shows the ratings of how workshop attendees perceive the potential of these MPIs to foster an agro-ecological transition in the case study area, according to the questionnaire provided. Stakeholders agree about the positive effects of most measures. No great disagreement emerged towards given MPIs.

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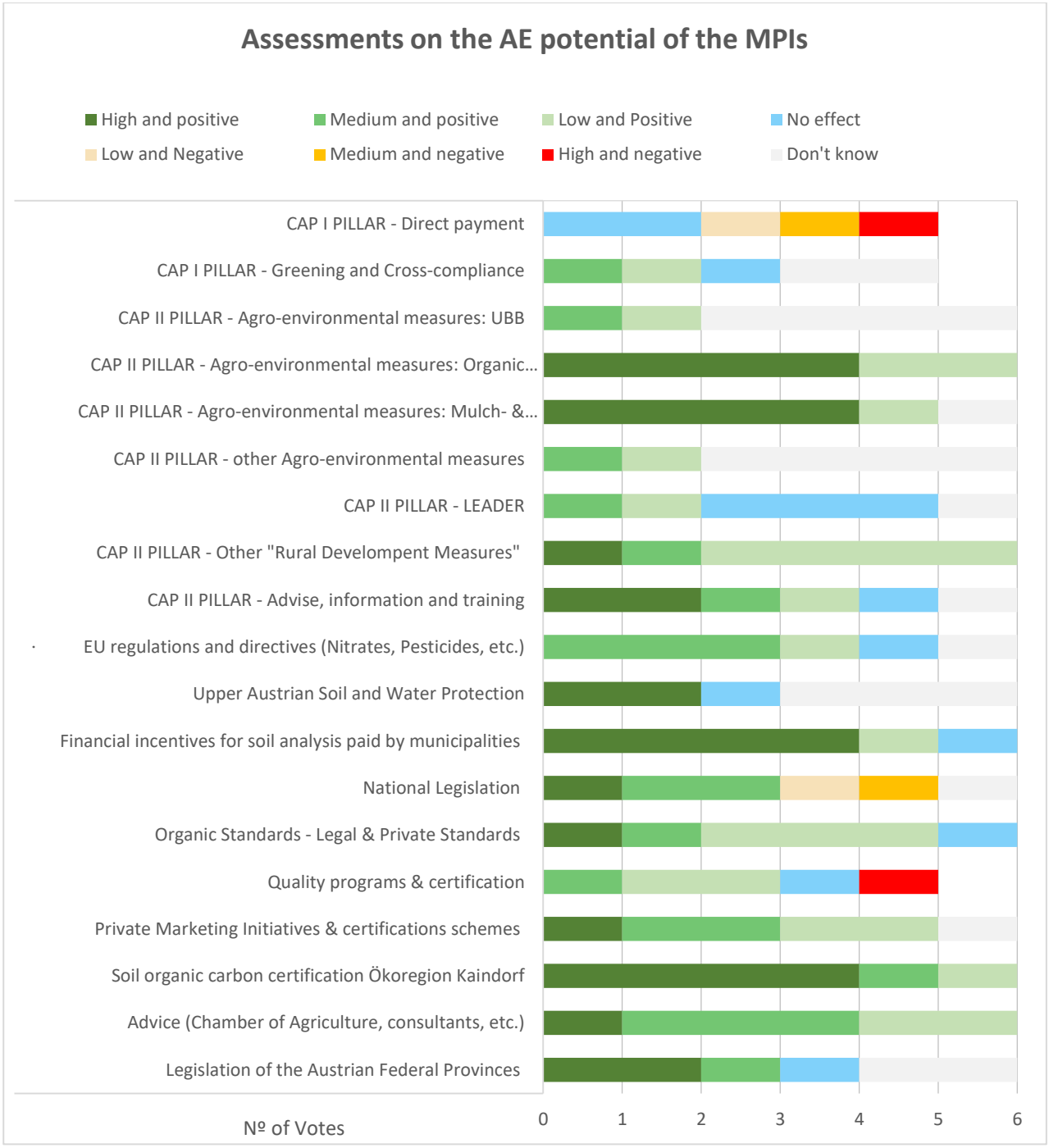
Figure A1. Synthesis of questionnaire results for the Austrian case study.



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The final scores, obtained from the **average of the individual votes**, show that the lowest rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **CAP I PILLAR- Direct Payment**	Low and negative
2. Quality programs & certification	No effect

Moreover, the best rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **CAP II PILLAR - Agro-environmental measures: Mulch- & direct sowing** 2. Soil organic carbon certification Ökoregion Kaindorf	High and positive
3. **CAP II PILLAR - Agro-environmental measures: Organic farming**	Medium and positive

The moderator made the decision about MPI selection for the barometer discussion based on a quick voting round among participants. Five instruments, three of them highlighted in bold, were further analysed through the barometer. Below is shown the participants' opinions with the arguments for and against that arose during the debate.

CAP PILLAR I - Direct payments

Participants' opinions - At the beginning of the discussion, opinions about the effects were divided. At the end of the discussion, the group agreed that this MPI does not support agro-ecological change, but potentially a major transition leverage has been seen in direct payment schemes of CAP pillar 1.

Arguments in favour - Money is needed if anything is to happen

Arguments against - Direct payments only make the big farmers bigger. The payments are made regardless of how - whether in an agro-ecological sense or not - the land is managed.

CAP PILLAR I - Greening and Cross-compliance

Participants' opinions - The participants rated this MPI from ineffective to slightly positive. In the end, the discussants agreed that this MPI needs to be sharpened to work better in an agro-ecological sense. Proposals for sharpening were as follows: (i) coupling the requirements or premium amount with biodiversity measures; (ii) coupling with slope or soil erosion risk, redistribution of funds for this measure at a national level.

Arguments in favour - After certain crops (cereals, soybeans), the plough is used less frequently, more winter greening and more arable flower strips are being cultivated.

Arguments against - This is just an alibi measure which only has a selective effect.

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CAP PILLAR II- Agri-environmental measures - Environmentally sound & biodiversity supporting management (UBB)

Participants' opinions - Environmentally sound & biodiversity supporting management (UBB) is a specific measure in the Austrian agri-environmental program ÖPUL. The participants rated this MPI from having little to slightly positive influence. In general, it has a rather positive effect, but there is a lot of room for improvement towards an ecological design of this MPI.

Arguments in favour - Positive effects for nitrogen and pesticide use

Arguments against - Weakening of integrated production, with increased amounts of papers (bureaucracy)

CAP PILLAR II – Agri-environmental measures: Mulch- & direct sowing

Participants opinions - Mulch- & direct sowing is a specific measure in the Austria agri-environmental program ÖPUL. This MPI has been assessed to a have a positive influence. It would propose to split this single measure up into two within the future ÖPUL.

Arguments in favour - It works as a soil protection measure (against water and wind erosion), promotes humus build-up and its effects are rapid. In the case of direct sowing, it was noted that, against an agro-ecological background, this should only go hand in hand with minimal, reasonable use of herbicides.

Arguments against - Mulch and direct sowing significantly differ from each other in terms of knowledge (know-how) investment requirements

CAP PILLAR II - Agri-environmental measures: Organic farming

Participants opinions – The measure about organic farming has a positive influence to address the challenge. The standardization and consolidation of control mechanisms was identified as a potential for further development.

Arguments in favour - Very positive agro-ecological impact

Arguments against - Many additional controls for other certifications (e.g., private food retail brands, EUREP-GAP, among others)

How the instruments relate to drivers and barriers

Barriers addressed by the instruments so far - Despite many activities, scepticism and lack of knowledge are still a barrier for AE farming. The lethargy or lack of innovation of farmers in general is an obstacle in the transition to agro-ecology. Socially and psychologically, a farmer's admission to a major transition is always associated with an admission that they may have managed the past few years and decades incorrectly. Furthermore, the big economic pressure and investments keep the farmers in the position they are in and the willingness to try something new is low. Another barrier is a deficit in cooperation between in main actors in AE farming at regional,

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state and national levels. Education would play an important role in raising awareness of pupils and future farmers in agriculture colleges for the humus formation idea.

Drivers addressed by the instruments so far - Climate change dynamics and impacts are increasing in the case study area and therefore the demand for measures and advice on climate change adaptation (climate-resilient agriculture) rises, too. One municipality is paying the farmers the costs of the first soil tests as well as one training course on humus formation. Such incentives are specifically a motivation for farmers who have some interest in agro-ecological farming but need a kind of momentum. AE farming helps municipalities to reduce off-site damages (e.g. of runoff and erosion). Instead of using tax payments for reparation a part of it could be paid in the form of incentives to farmers.

Effectiveness of MPIs

Workshop results show a particularly high level of disagreement regarding the AE transition impact of direct payments. On the other hand, participants draw a positive picture of the Austrian agri-environmental program ÖPUL, especially the measures “organic farming” and “mulch and direct sowing” will contribute effectively to the transition to AE farming systems and to tackle the case study challenge. For other ÖPUL measures, participants were more sceptical, but at least none of the other measures is countering an AE transition. Regional MPIs as soil organic carbon certification or financial incentives for soil analysis paid by municipalities were seen rather positive and effective to support the transition to AE farming systems. Different opinions among participants were obvious for state and federal legislation to support AE transition. Parallel to CAP pillar 2 rural development measures, here would be some leverage for supporting AE transition by linking them more directly to ecological criteria.

Lessons learned

Participants expressed broad consensus for most of the instruments required to pursue the transition. Difference of opinions emerged with respect to Q1, CAP I PILLAR - Direct payment, Q15, Quality programs & certification schemes - meta-, EU- & national level and Q17: National Legislation (National Soil Protection Law, Protection of water bodies & ground water).
The experiences made can be used as a blueprint for establishing other incentives on a communal level. Municipalities - not only in the case study region- are confronted with high and increasing costs for repairing off-site damages of runoff and soil erosion in case of major rain events. Instead of using tax payments for reparation a part of it could be paid in the form of incentives to farmers.
Participants were very active, and we got very good feedback regarding the workshop as well as the entire project. For the workshop coming we will amplify the group with specific persons from the ministry and the chamber for agriculture.

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2. ARABLE LAND MANAGEMENT ON ORGANIC DAIRY FARMS (VYSOČINA REGION, CZECHIA)

Data collection method: Workshop Option A
Duration of the workshop: 3 hours
Number and profile of participants: 9 participants from Farmers and farmers' associations (4), Science, innovation, advisory, capacity building (2), Authorities and administration (1) and Agri-food value chain (2)

Key dilemma

How to maintain the good performance of arable land management in organic dairy farms in Vysočina region to reduce arable soil degradation and water pollution by pesticides while ensuring economic viability?

General overview of Drivers and Barriers

Ten key barriers and drivers were identified in the case study. These include (a) investments needed during transition, (b) new knowledge gaps, (c) access to land, (d) missing economic incentives, (e) access to organic seeds and fodder, (f) human capital – employees, (g) human capital – inhabitants' complaints about farming, (h) price premia – uncertainty, (i) milk sales/logistics – uncertainty, and (j) supporting policies (area and investment support under RDP). Few of these barriers, e.g. (a), (h) and (j), can hardly be addressed by locally developed management strategies due to lack of impact of SES actors on market prices or directly being tied to the CAP or national politics. In contrast, strategies are envisaged to address new knowledge gaps on markets for organic products, human capital that all farm family members and employees believe in new practices of the transition process, or addressing human capital with respect to rural inhabitants and communities and their attitude towards farming restoring appreciation and sympathy for farming and its contribution to the rural economy and environment.

Analysis of MPIs

The preparatory desk research for the workshop allowed the identification of 12 MPIs related to the key dilemma[1]. Figure A2 provides the rating of how the workshop attendees perceive the

[1] The majority of relevant instruments are policy measures of the CAP including Pillar I direct payments and greening and a range of measures of the Rural Development Programme in the Czech Republic co-funded by the EU (Pillar II of the CAP. In addition, EU-level directives such as the Nitrate and Pesticides Directives as well as the EU organic farming certification scheme are included. Specific Czech MPIs include support of knowledge about regionally recognised food products coordinated at regional level by local NGO and the national promotion of organic farming produce implemented by Ministry of Agriculture (delivered by Paying Agency).

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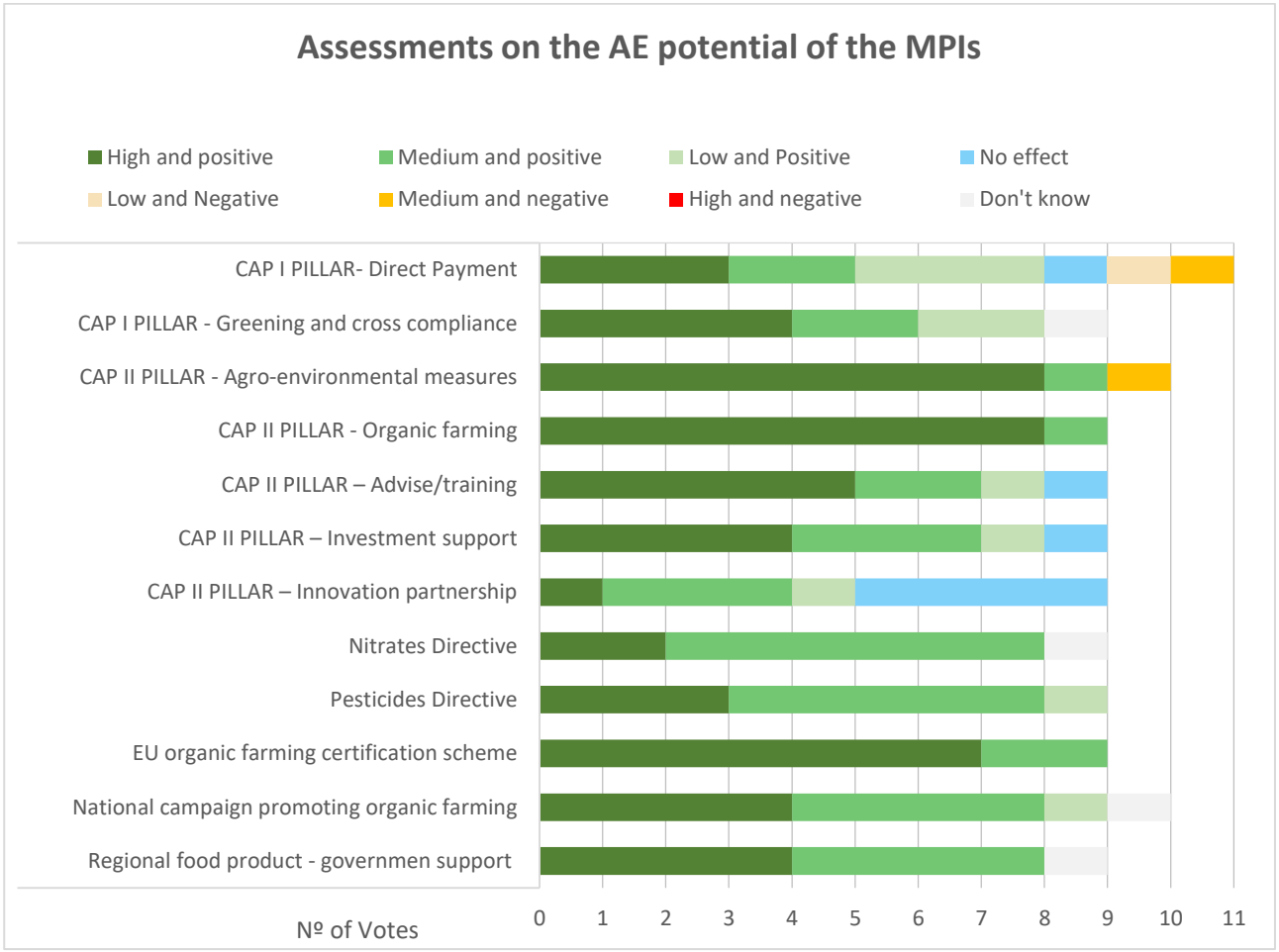
potential of the different MPIs to foster an agro-ecological transition in the case study area, based on the provided questionnaire. For most of the surveyed MPIs the respondents perceive a positive potential for agro-ecological transitions. Only for few MPIs differences in views are observable[2].

Figure A2. Synthesis of questionnaire findings for the Czech case study[3].



The final score of these MPIs obtained from the **average score** of all individual votes was maintained in all the MPIs, except for the last measure "Regional food product", where the average ranked it as "high and positive", whereas in the subsequent debate it was considered to be a "medium and positive" instrument.

[2] For example, the perceived potential of the Pillar I direct payment ranges from a medium negative potential to a high positive potential for agro-ecological transitions with the majority of attendees assigning a positive potential to these area-based payments.

[3] As seen in the graph, in 3 MPIs there were more votes than voters (9). This is because in these cases, some participants considered that the measure could have both positive and negative effects, so they gave more than one vote.

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Consequently, the lowest rated or valued MPIs (although still positive) were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. CAP II PILLAR – Innovation partnership 2. CAPI I PILLAR – Direct Payments	Low and positive

Moreover, the best rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **CAP II PILLAR – Organic farming** 2. **EU organic farming certification scheme**	High and positive

Later, the participants selected 5 MPIs that they considered most relevant for further assessment (2 of them highlighted in bold above). Here we present the main arguments emerged during the debate.

CAP II PILLAR - Organic farming (area support)

Participants' opinions – This instrument targets income stability of organic farmers (especially during transition period) and compensates for public goods provided. The opinions of participants were distributed across the whole range of assessment options from very negative to very positive.

Arguments in favour - The organic farming support motivates farmers to transition towards organic farming, compensates for the income foregone and additional cost linked to the protection of the environment in particular in the conversion stages (e.g. initial decrease of productivity and revenues) and stabilises farm income. In particular if combined with training it raises the awareness and willingness of farmers to move towards more ecological production – setting up beneficial conditions.

Arguments against - The lack of payment differentiation limits the effectiveness of the support. Applying the same payment rate for all geographical areas (arable land and grasslands supports) does not take into account different farming conditions and cost of conversion. In addition, some farms only join to maximise revenue from subsidies but do not produce organic commodities (either limited production or production ends up as conventional commodities). This is related to the underdeveloped organic food market and low demand.

EU Organic farming certification scheme

Participants' opinions – This instrument targets reliability and recognition of the products from organic farming on market, therefore, indirectly supports sales. Most of the participants expressed very positive opinions highlighting the potential of the certification scheme for promoting transition to organic farming, but also two neutral and three negative views were expressed.

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Arguments in favour – This instrument promotes the generation of an added value from organic production for farms and labelling leads to reliability and trust between consumers and producers on markets for organic products. The certification scheme does not entail excessive administrative burden and the administrative costs are comparatively low in a European context. However, contrasting opinions regarding the cost of certification were expressed by participating farmers which might reflect different levels of human capacities on farms to cope with the administrative processes.

Arguments against - The effectiveness of the certification scheme was questioned. Farmers are not excluded quickly enough from the certification system, if they fail to comply. Also, farmers can change the certification body as a defence strategy. Also, the certification system only covers basic rules of organic farming (EU Regulation) and additional rules (extra standards) would strengthen the certification system and further increase reliability and trust.

CAP II PILLAR - Agri-environmental measures

Participants' opinions – This instrument targets income stability of organic farmers (especially during transition period) and compensates for public goods provided. Most of the positive statements were regarded as very positive and only one negative as very negative.

Arguments in favour - Agri-environmental measures can be combined with organic farming support and provide additional motivation to transition the organic farming. These payments are beneficial for farms with low intensity and contribute to stabilising their farm income. To some extent agri-environmental measures also have a positive effect on the motivation of farmers to protect the environment and an educational effect (e.g. awareness of biodiversity notion is rising) can be attributed.

Arguments against - It was pointed out that the eligibility conditions for agri-environmental payments could limit the production intensity (e.g. in terms of large animal units per hectare), because it is linked to grasslands only, but dairy farms frequently produce fodder also on arable land (thus the limit creates artificial too high and not real density on grasslands). The range of schemes is not wide enough to give organic farmers more options and flexibility to take up agri-environmental measures. In some cases, prescriptions of the measures could limit standard practices of farming that are currently applied (e.g. rules linked to stables with animals with no access to pastures). And concerns were raised that agri-environmental measures could also benefit land managers who do not produce any commodity.

National campaign promoting organic farming

Participants' opinions – This instrument targets stability of sales and getting a higher price for organic commodities. The opinions of participants were distributed across the whole range of assessment options from very negative to very positive.

Arguments in favour – The national campaign to promote organic farming was only launched in 2019. This instrument addresses the need for promotional campaigns for organic

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farming and raises the awareness of the benefits and quality of organic products. The campaign has the potential to increase demand for organic products and to address difficulties of organic farmers to sell their products at a premium price. However, the effectiveness of the national campaign also depends on the support and positive attitude of farmers to actively participate in such a campaign.

Arguments against - Negative experience with previous campaigns could reduce the effectiveness of the new national campaign (the earlier campaign was carried out by a large marketing company promoting organic products as "healthier", which is not entirely true - the campaign resulted in distrust and negative consumer feedback). The current national campaign is again managed by the paying agency (delegated by the Ministry of Agriculture), which assigned it to the winning marketing agency... communication with the OF sector is minimal and it will not be probably possible to link that with current organic farming activities on lower level.

It has also become more difficult to promote organic farming as the differences between conventional and organic farming decrease due to policy drivers such as pesticide directive or greening. The campaign has the risk of providing “low value for lot of money”. Instead, support of producers and support of cooperation (e.g. marketing cooperatives, distribution networks) would be more efficient.

Regional food products – regional government support (designed by NGOs)

Participants’ opinions – This instrument indirectly targets stability of sales and getting a higher price for organic commodities. The opinions of participants were distributed across the whole range of assessment options from very negative to very positive.

Arguments in favour – The label promotes short chains and supports local farmers. It raises awareness of regionally produced food amongst consumers and has a positive impact on their decision to buy local / regional products. The short supply chains foster trust between consumers and producers, reduce transport and decrease the carbon footprint.

Arguments against – The regional label does not specifically support organic farming, but organic food often has that label. The “food of regional origin” became a stronger label than the organic farming label with the result that some farmers changed the label they were signing up to from organic to regional. Specifically, in the case study region Vysočina the selling of regional products has a limited potential because of low purchasing power in the region. Paradoxically, the sale of regional products is larger in the capital (Prague). In some cases, in the past products with a regional label became luxury goods, which is not favourable to increasing markets for organic products.

Lessons learnt

Agri-environmental measures and organic farming area payments are important instruments to financially support organic farming and to start the AE transition in general. But inflexible prescriptions which do not fit all conditions and the diversity of organic farming systems and

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payment levels that are not enough or not tailored to regional specificities reduce their effectiveness in supporting a transition. Organic farming certification is regarded by most of stakeholders as a very effective tool to foster market for organic products (e.g. certification supports reliability of label). But some smaller farmers see that as additional costs. From a research perspective it is perceived that it is easier to make a transition to organic (agro-ecological) farming for an already diversified farm as this is closer to an organic system, but practitioners and advisors reflected on the transition from point of view of certification requirements which are more difficult to design and achieve if more activities in a diversified system have to be certified. Regional and national schemes promoting organic and regional products have the potential to support sales of organic products, but there are concerns about the effectiveness based on previous experiences. There is an understanding that support for advice, information and training is a very important instrument, but the existing support is weak (e.g. advice is not supported through RDP) and also the knowledge transfer system does not fit to the needs of organic farmers.

For the main barrier in this case study (no stable access to the market with a right price) there is a lack of market and policy instruments that could directly help to improve and ensure market access. If investment support is regarded as a potential help in starting their own processing, then there is a condition which prevents using that – it is not available to producers' groups and sometime not easy to apply for small farms (e.g. in CZ below 100 hectares).

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3. PLANNING A DAIRY SECTOR DRIVEN BIO-PRODUCT PLANT (NIVALA, FINLAND)

Data collection method: Interviews Option C
Duration of interviews: 1-2.5 hours
Number and profile of interviewees: 7 interviewees from Science, innovation, advisory, capacity building (1), Authorities and administration (2), NGOs, civic society organisations, local community representatives (1), Farmers and farmers' organizations (1) and Agri-food value chain (2).

Key dilemma

How to reduce harmful climate, soil and water impacts of dairy farming in Nivala region without sacrificing economic viability of the dairy sector, by means of envisioning and implementing a multipurpose bio-product plant along the lines of circular bioeconomy, with the aim of producing bioenergy and organic fertilizers from manure.

General overview of Drivers and Barriers

Addressing of the barriers and drivers is a tricky task in this case study, because there are two alternatives, and partly competing strategies for biogas promotion at stake. This, in turn, means that a given driver which advances either the centralized biogas production strategy (i.e. the bioproduct plant) or a farm-level biogas production strategy, can simultaneously be a barrier to the promotion of the alternative biogas strategy.

Analysis of MPIs

The preparatory desk research for the interviews allowed the identification of 12 MPIs related to the key dilemma. The interviewees evaluated the agro-ecological effect of these market and policy instruments on agro-ecological transition, according to their knowledge and experience.

Figure A3 shows the results of the questionnaires completed by the interviewees. All the MPIs evaluated were positive evaluated even with a minimum positive score. Although it also stands out that there are many opinions considering several instruments with "no effect".

Figure A3. Synthesis of questionnaire findings for the Finish case study.

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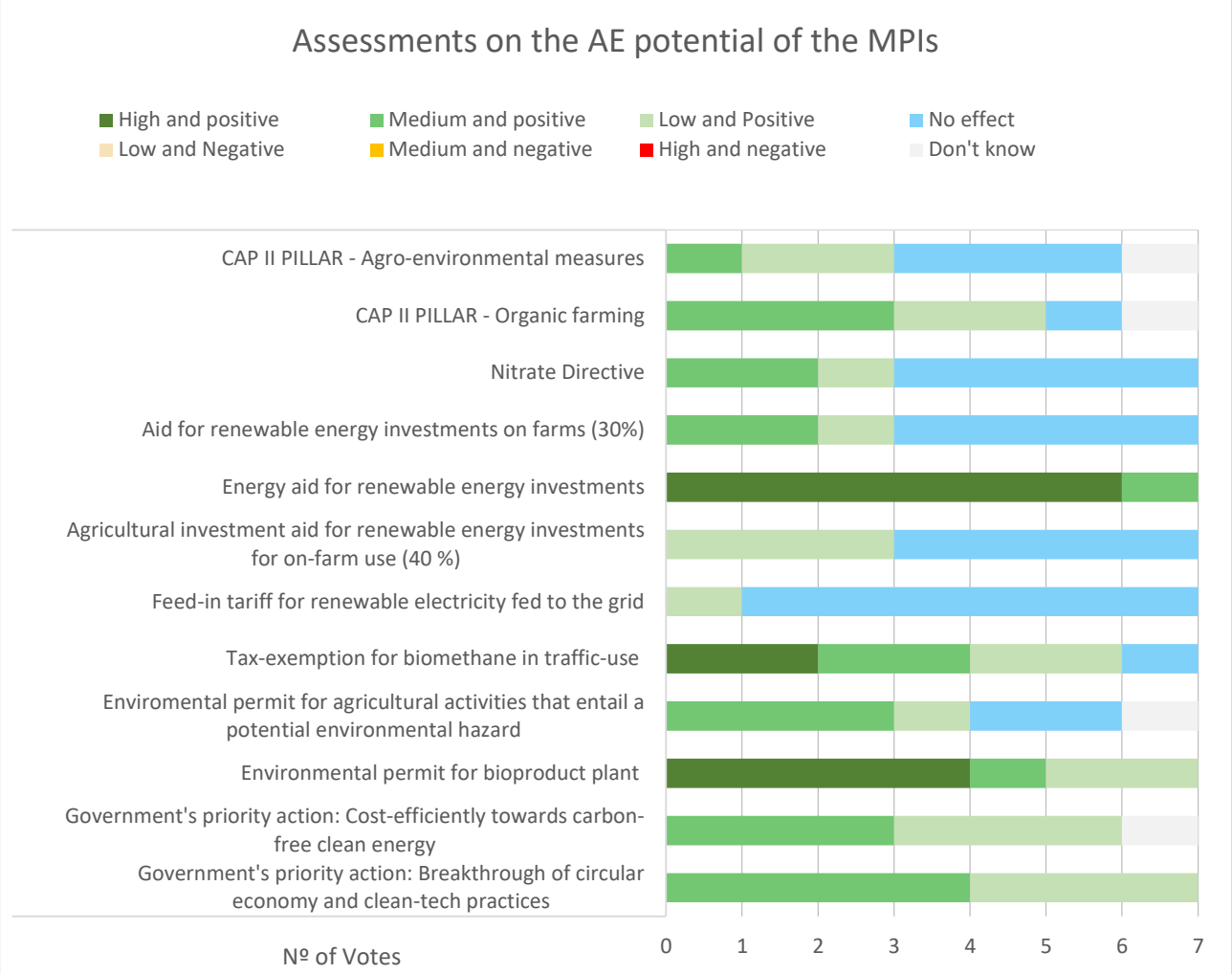

The final scores, obtained to the **average of the votes**, show the lowest rated or valued MPIs:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **Organic Farming** 2. **Environmental permit for agricultural activities that entail a potential environmental hazard** 3. **Nitrate Directive** 4. **Aid for renewable energy investments on farms (30%)** 5. **CAP II PILLAR - Agro-environmental measures**	Low and positive
6. **Agricultural investment aid for renewable energy investments for on-farm use (40 %)**	No effect

Moreover, the best rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **Energy aid for renewable energy investments**	High and positive

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2. **Environmental permit for bioproduct plant** 3. **Tax-exemption for biomethane in traffic-use**	Medium and positive

The interviewees were able to analyse in depth the 9 MPIs listed above. Here we show the arguments for (positive aspects and conductive factors of the instrument) and against (negative aspects and restrictive factors of the instrument).

CAP II PILLAR - Organic farming

Arguments in favour – It was commonly commented that organic farming is beneficial for and contributes to the AE transition, especially in terms of facilitating nutrient recycling, because in organic farming there is enough interest and economic motivation to stick to nutrient recycling, partly due to the organic farming compensation measures. More specific positive aspects concerning the potential to facilitate the realization of the bioproduct were also taken up by some interviewees; it was noted that organic fertilizers (which are allowed to be applied in organic farming) would most likely be profitable products for the Nivala bioproduct plant, and thus an increase in the organically cultivated field area would also mean larger markets for the Nivala bioproduct plant.

Arguments against - It was commented that the measure as such does not contain incentives to promote transition towards increased bioenergy utilization, and that from the perspective of the possible Nivala bioproduct plant the measure does not have much perceivable impact nor serve as a direct incentive for the realization of the plant.

Environmental permit for agricultural activities that entail a potential environmental hazard

Arguments in favour - Some interviewees commented that the environmental permit serves as a clear motivator for expanding farms to engage in nutrient recycling options in order to reduce the need of additional manure spreading acreage. Without the environmental permit system, farms could dump their manure somewhere, meaning that they wouldn't have an incentive to deliver it to the Nivala bioproduct plant.

Arguments against – Some interviewees noted that farmers have been critical towards the way the manure spreading area is calculated in the environmental permit process. A better outcome would be achieved by emphasising the use of BATs in manure handling, not only manure spreading area. Some interviewees also suspected that the conditions of the environmental permit have not been strict enough to make many farms apply nutrient recycling.

Nitrate Directive

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Arguments in favour: It was noted that the measure may help to reduce possible nutrient flows into water systems.

Arguments against - It was noted that the measure is relevant only for farms that do not belong to the agri-environmental schemes, and therefore the total impact of the measure in the Finnish context (where farms often belong to the agri-environmental schemes) is minor. It was also noted that it is quite difficult to detect the direct impact of the directive for the possible realization of the Nivala bioproduct plant.

Aid for renewable energy investments on farms (30%)

Arguments in favour - It was commented that the renewable energy investment for farms (where farms are entitled to sell the energy outside the farm, if they establish a separate company for that purpose) holds the potential of supporting nutrient recycling in a regional scale, and also obviously advances the use of bioenergy and biogas, for example, for transportation purposes.

Arguments against – It was commonly noted that the role of renewable energy investment for farms is somewhat ambiguous and contested, especially vis-à-vis the prospects to realize the bioproduct plant in Nivala, since the farm aid might actually encourage farms to establish their own farm-level biogas plants and start to compete in energy production with the envisaged Nivala bioproduct plant. If farms would thus more commonly opt to invest in farm-scale plants instead of choosing to collaborate with the planned bioproduct plant, the correlation with the realization of the bioproduct plant would be negative.

CAP II PILLAR - Agro-environmental measures

Arguments in favour - Some interviewees commented that via restrictions on fertilizer use the environmental compensation measures help to advance nutrient recycling and help to better balance and target the nutrition load on farms. Furthermore, restrictions in manure spreading provide an incentive to utilize manure in biogas production (and possible in the envisaged bioproduct plant).

Argument against – Some interviewees commented that currently nutrient recycling does not work as it should, and one reason for this is that the agro-environmental measures do not provide enough tools for that. It was also noted that this compensation measure does not serve as an incentive for farmers to engage in delivering manure to the envisioned bioproduct plant.

Agricultural investment aid for renewable energy investments for on-farm use (40 %)

Arguments in favour - It was commented that the aid for renewable energy investment for on-farm use (where farms are not entitled to sell the energy outside the farm) may contribute to the AE transition both in terms of facilitating nutrient recycling and in terms of increased bioenergy use; in terms of nutrient recycling, in particular, the nutrients can be better targeted to plants after the gasification process of (liquid) manure.

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Arguments against – It was noted that also the aid for renewable energy investment for on-farm use holds problems, and a potential mismatch, with investment aids targeted at industrial-scale bioproduct plants. If farms in Nivala area decided to utilize this investment aid in a larger scale (and thus use their manure themselves), it would clearly reduce possibilities of the Nivala bioproduct plant to get enough manure for its process.

Energy aid for renewable energy investments

Arguments in favour - The significance of the energy aid for the (possible) realization of the Nivala bioproduct plant was commonly acknowledged by the interviewees, as the profitability of the investment in the plant was acknowledged as being heavily dependent on enough investment subsidies. It was also noted that via its potential to boost realization of industrial scale bioproduct plants, the aid may also help to encourage farms more generally to start to operate in renewable energy business in rural areas.

Arguments against – No major arguments against the energy aid were presented, but it was noted that since the energy aid is subject to political decision-making, uncertainty about the possible changes in the levels and substantial formulations of energy aid pose challenges for entrepreneurs and farms who are planning their future activities and considering investments.

Environmental permit for bioproduct plant (based on the evaluation of environmental hazards involved in the operation)

Arguments in favour - The opinions on the significance of the environmental permit for bioproduct plant measure were somewhat mixed: The interviewees commonly acknowledged that this permit plays a significant role in the establishment of the Nivala bioproduct plant, since the operation of the plant has to be environmentally solid and sustainable. However, the views about the role of the measure in facilitating AE transition more generally were more varied and, as some interviewees commented, more indirect and difficult to detect and predict.

Arguments against – The opinions on the significance of the environmental permit for AE transition were somewhat mixed and some interviewees commented that the contribution of the measures in this respect may be quite indirect and difficult to detect and predict.

Tax-exemption for biomethane in traffic-use

Arguments in favour - Some interviewees commented that the tax-exemption has probably encouraged biogas production which, in turn, has had a positive impact on nutrient recycling. It was also commented that this measure has no doubt been a motivator when the Nivala bioproduct plant planning was started and it also holds a potential to boost the selling and distribution of biofuels produced by the bioproduct plant (if the plant is realized).

Arguments against – It was noted that the status of the tax-exemption as a policy instrument is problematic since it constitutes a form of illegal state subsidy; consequently, the

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intention is to terminate the implementation of this instrument soon. The instrument is closely linked to the obligations set for the distribution of renewable fuels, and the intention is to clarify the relations between these measures soon.

How the instruments relate to drivers and barriers

The Nivala case study provides an interesting example of how MPIs simultaneously promote two alternative solutions or strategies, which in practice compete and that relate differently to barriers and drivers despite the same context. For example, the various forms of energy aid (energy aid for investments in renewable energy, aid for investments in renewable energy on farms, agricultural investment aid for renewable energy investments for on-farm use) and tax exemption for biomethane in traffic have tackled the barrier of low economic profitability of biogas investments and companies. However, given that the instruments favour alternative and rival strategies for biogas production (centralized versus distributed), they can also emerge as additional barriers to a competitive biogas production strategy.

Effectiveness of MPIs

Most of the MPIs were regarded by the interviewees as having both pros and cons as instruments that ought to, by definition, contribute positively to the ongoing agro-ecological transition (of which the possible realization of the bioproduct plant can be taken as an example). Most of the MPIs received a considerable amount of low ratings by the interviewees, which can be interpreted as a sign of rather poor policy impact potential. Notably, however, the potential of energy aids was generally viewed positively; especially if they could still be developed into a bit more bioenergy-friendly direction, they were viewed as holding considerable potential to facilitate a broad-based agro-ecological transition via boosting the recycling of nutrients and increased use of bioenergy.

Lessons learned

The role of energy aid (i.e., renewable energy investment aid) for the realization of the bioproduct plant was regarded as very important by all interviewees. Opinions about the potential of the instruments on CAP II PILLAR - Agro-environmental measures, CAP II PILLAR - Organic farming and "Tax-exemption for biomethane in traffic-use" to facilitate AE transition were peculiarly mixed.
A major obstacle observed relates to the existence of two alternative and rival strategies for the development and promotion of biogas businesses, that is, the industrialized centralized solution or the distributed farm scale solution. The co-construction of the optimal management strategy among the stakeholders in Nivala, therefore, is not easy to carry out. The eventual choice between centralized and distributed options in biogas production and nutrient recycling will probably depend on the emphasis given to the different agro-ecological and socio-economic objectives.

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4. CONNECTING CUMAS TO FOSTER THE ADOPTION OF AGRO-ECOLOGICAL PRACTICES FOR VITICULTURE (AUVERGNE RHÔNE ALPES, FRANCE)

Data collection method: Interviews Option C
Duration of interviews: 1-2 hours
Number and profile of interviewees: 5 interviewees from Science, innovation, advisory, capacity building (3), Authorities and administration (1) and NGOs, civic society organisations, local community representatives (1)

Key dilemma

How to reduce dependency on external fertilisers and to reduce pesticides use (especially glyphosate) through agro-ecological practices increasing soil ecological services (soil biology) while maintaining the economic viability of farms?

General overview of Drivers and Barriers

Given the market pressure, farmers are not willing to take the risk of reducing the economic sustainability by implementing practices in favour of biodiversity and environment often considered as less productive and more extensive. Environmental concerns arriving from the society are more and more perceived by farmers as an economic opportunity, possibly allowing them to access to new markets and sometimes to achieve a better value added. This trend is weak because the differentiation and the qualification of wines remain mainly based on the notions of "terroir" (the place) and the certification of origin (PDO, PGI certifications). The multi-level governance is efficient both for policy implementation and marketing strategies; however, there is not enough link between these levels. Reducing the use of pesticides or chemical fertilisers is not easy and most farmers face technological lock-ins, e.g. missing agricultural machinery suitable for steep slopes to replace chemical inputs.

Analysis of MPIs

The preparatory desk research allowed the identification of 19 MPIs, most of them (17 out of 19) being policy instruments. Interviewees were asked to assess the potential positive and negative effects of each of the instruments and to explain in a qualitative manner their assessments. The questionnaire about the relevance of the MPIs for addressing the dilemma highlighted stakeholders' general agreement about the positive effects of most measures (Figure A4).

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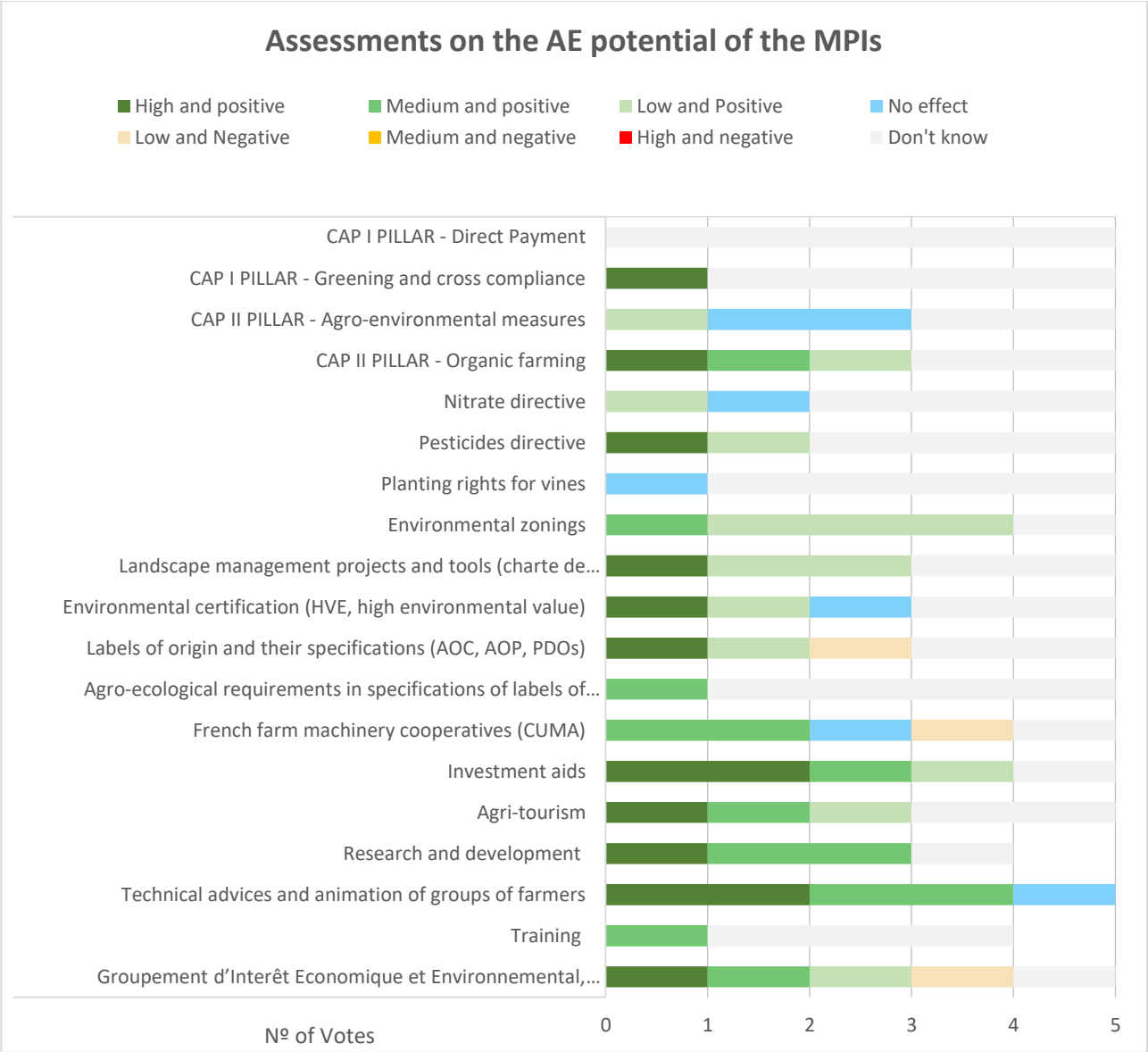
Figure A4. Synthesis of questionnaire findings for the French case study.



No great disagreement emerged towards the entire set of MPIs (some interviewees considering that their effects were positive while other considered them as negative). However, it is noteworthy that in many MPIs the interviewees answered that they did not know the effect that these MPIs were having on the transition to AEFS, so that in these cases the result is not representative. Therefore, in three of these MPIs, it was agreed that, according to the subsequent debate and knowledge on the subject, the actual effectiveness was as follows:

- CAP I – Direct Payment: No effect
- CAP I – Greening and cross compliance: No effect (It could have a "high and positive" effect if it would be properly used).
- Planting rights for vines: No effect

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The final scores, obtained from the **average of the individual votes** and the three **agreed corrections** noted above, show that the lowest rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. CAP I PILLAR- Direct Payment	No effect
2. CAP I PILLAR – Greening and cross compliance	No effect

Moreover, the best rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. Research and development 2. Investment aids	Medium and positive

Most of the 19 MPIs were discussed in more depth during the interviews. Here we present the five that have been most frequently cited. These 5 MPIs do not correspond to the best or worst ranked, but those where there was more debate and discrepancy (although they were mostly valued with a positive effect).

Quality Schemes (labels of origin)

Participants' opinions – Currently, the labels of origin (PDO, PGI) have been designed to highlight the products' specificity and typicity but not to consider environmental issues. In 2018, the French ministry of agriculture and the French institute for wine and vineyards published a common guide about "agro-ecological farming practices and viticulture". Its purpose is to encourage the management committee of each label of origin to consider including agro-ecological practices in the production rules. However, the inclusion of agro-ecological practices in the production rules remains a voluntary initiative.

Arguments in favour – There was an official communication highlighting that label of origin could be used as a tool to foster the adoption of agro-ecological practices.

Arguments against – Some of rules stated in the PDO/PGI production method can even be counterproductive regarding environmental issues. The time frame of the legal process to revise and modify the production rules of a PDO or PGI is very long (several years). So even if decided, the inclusion of agro-environmental practices in the labels' production rules would be very long.

High Environmental Value farming certification scheme

Participants' opinions - There are very few environmental certification schemes in France. One, currently gaining importance, is the High Environmental Value (HEV) farming scheme. Production rules have been set up at national level and the scheme is recognised and promoted by the French ministry of agriculture. The HEV certification scheme is composed of 3 different levels of certification (level 3 being the most ambitious one). The level 3 certification gives the right to

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use a label on the products. There is no consensus about the potential effect of the HEV certification scheme and as to whether it will be an instrument targeting weak or strong agro-ecology.

Arguments in favour - It offers the possibility to have a market reward for recognising sustainable farming practices. It can thus be an economic incentive for farmers to get certified and possibly to improve their farming practices.

Arguments against – This certification scheme is seen as a tool for weak agro-ecology mainly, with the risk of green washing and of negative effects on the adoption of agro-ecological farming practices. Some of the certification requirements are considered as being too weak, especially concerning the use of external inputs. Some point out that the level 3 certification can be obtained by many farmers without them having to change their current farming practices. Furthermore, in viticulture, it seems that the level 3 certification is becoming a requirement to access to the market (as supermarket chains are currently including it in their minimum requirements). There is a risk that the instrument is used as a low requirement baseline accessible to most farmers.

CUMA - French farm machinery cooperatives and GIEE - economic and environmental interest group

Participants' opinions - Two of the instruments facilitating collective investments and dynamics for farmers' groups have been analysed: the CUMA (French farm machinery cooperatives) and the GIEE (economic and environmental interest group). CUMA are farm machineries cooperatives. GIEE is a label delivered by the French ministry of agriculture to farmers' groups considered as innovative both in terms of economic and environmental performances. Non-agricultural stakeholders can also be involved in GIEE. Both GIEE and CUMA recognitions give access to subsidies (i.e. to finance facilitation actions from extension services) and investment aids to acquire collectively machineries and equipment's. There was no consensus about the potential of these two instruments. There is a real need to have clear selective requirements and strict criteria to decide which types of machineries or actions are eligible.

Arguments in favour – Some see these tools as having a potential positive effect because they foster exchanges between farmers at local level and offer them the possibility to experiment collectively new practices. Farmers involved in such groups might be more likely to take the risk of experimenting innovative agro-ecological practices.

Arguments against – The existence of some side effects have been pointed out. According to some stakeholders, some farmers' groups are making use of the tools to get large investments aids and buy machineries and equipment which are not related to the adoption of agro-ecological practices and which do not offer any environmental benefits.

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Advice and information for groups of farmers

Participants' opinions - Advice, facilitation and animation for groups of farmers are generally considered as having a positive potential on the adoption of agro-ecological practices. They are necessary to encourage farmers to experiment. Advise and facilitating targeting "strategical thinking" at farm level and at group level are also considered as being necessary to get farmers to consider environmental issues and to accompany them in the transition (rather than technical advice only).

Arguments in favour – It enables sharing of knowledge and know-how amongst farmers as well as between farmers, technicians or researchers. A holistic approach should be considered next to the classical technical advice.

Arguments against – Advising and facilitation for farmers' group is very time consuming and having very limited concrete effects on farmers' choices afterwards. Only open-minded farmers will make use of such tools. Other approaches should be used with more reluctant candidates.

How the instruments relate to drivers and barriers

Barriers addressed by the instruments so far – Most instruments used to foster the adoption of agro-ecological practices in viticulture are policy instruments which aimed at dealing with the technical difficulties and reducing the risk and insecurity related to the adoption of agro-ecological practices.

Agri-environmental measures (including conversion to organic farming), advice and information, investments aids aim at supporting farmers willing to implement new types of practices and provide means for innovating, experimenting and sharing knowledge and know-how.

Drivers addressed by the instruments so far – Up to now, there are very few market instruments enabling to offer an economic reward and a premium price for sustainable practices. The organic farming scheme is the main market instrument in place. Recently, two other types of market instrument emerged: the high environmental value farming scheme (the 3rd level being the only one allowing labelling the end products) and the PDO and PGI quality schemes which could in the future consider introducing some agri-environmental practices in their production rules. These two recent initiatives are an attempt to offer economic incentives for farmers engaged in adopting some agro-ecological practices and thus to use the market as a driver for the transition.

Effectiveness of MPIs

The policy instruments implemented so far in viticulture have enabled to work on different mechanisms:

- Providing financial supports for farmers willing to experiment new practices and implement sustainable practices;

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- Enabling collective action (creation of farmers groups, intervention of extension services to accompany these groups, fostering formalised peer to peer knowledge and know-how exchanges…);
- Producing and spreading new knowledge (through research, experiments, training…);
- Designing tools and activities to highlight the role that farming, and farmers, can play for the environmental and thus enabling a better mutual understanding of the stakes and potential roles of farmers between farmers, consumers and citizens.

Although targeting different mechanisms, most of the analysed instruments were considered as being only partly effective and dealing with only one mechanism. Different criticisms were mentioned referred to the misuse of investment aids, the limited impacts of advice and training, the low environmental requirements of quality schemes (HVE, PDO, PGI). To increase the efficiency of these instruments, it is of outmost importance:

- to set up clear and targeted implementation criteria and requirements to avoid unforeseen side effects
- to develop and implement contextual reasoning on how to combine sectoral MPIs in a relevant manner for a specific socio-ecological context and its related key dilemma.

The tools implemented so far have been quite successful in providing support for farmers who volunteered to improve their farming practices. However, they have not been successful in fostering an agro-ecological transition at large scale in viticulture.

Lessons learned

An innovative aspect of the case study is the aim to interconnect different territorial groups. Farmers are already part of a local CUMA, and the establishment of an inter-territorial network aims to facilitate the process. The core idea of this double network of farmers (at local level in each CUMA and at regional level with the network of CUMAs) is to overcome certain barriers based on exchanges between farmers. This mode of operation can act on certain fears of farmers, help to share knowledge to handle technical roadblocks, empower farmers to get public support but remain insufficient for other difficulties as the economic barriers. Markets tools should be developed to give price premium (or easier access to market) for farmers having sustainable practices and to set higher baseline requirements in terms of farming practices sustainability.

New types of tools should now be used to engage agro-ecological transition at a larger scale, by taking on-board farmers who tend to be reluctant to changes their practices, and to ensure massive and deep changes in farming practices in the long run. Next to voluntary instruments, environmental regulations and policies could be strengthened (up to now they concern mainly water quality preservation) to set mandatory baseline requirements and to reach some minimum targets and objectives.

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5. DEVELOPING STRATEGIES FOR AGRO-ECOLOGICAL TRANSITIONS IN ARABLE FARMING SYSTEMS (NIENBURG COUNTY, LOWER SAXONY, GERMANY)

Data collection method: Workshop Option A reduced
Duration of the workshop: 3 hours
Number and profile of participants: 7 participants from Science, innovation, advisory, capacity building (3), Authorities and administration (2), Farmers and farmers' associations (1) and NGOs, civic society organisations, local community representatives (1)

Key dilemma

How to integrate agro-ecological practices on arable land in highly market-oriented farming systems to reduce biodiversity loss and water pollution threats without significant negative impacts on the economic viability of farms?

General overview of Drivers and Barriers

Seven key barriers and drivers were identified in the case study. These include (a) the high bureaucracy of policy support, (b) the control mechanisms associated with receiving funding for implementing agro-ecological practices, (c) the lack of planning reliability and flexibility when implementing measures, (d) missing economic incentives, (e) land rental agreements that hinder or restrict the scope for implementing agro-ecological practices, (f) a lack in participation when designing political incentives (mainly determined by the ministry of agriculture and its approval and control authorities), and (g) the attitude of farmers and their knowledge of the requirements and benefits of agro-ecological practices. Some of the central barriers, such as (a), (b), (c) and (f), can hardly be addressed by locally developed management strategies due to directly being tied to the CAP or national politics. In contrast, strategies are envisaged to address the missing economic incentives (such as the regional label, cf. below), the land rental agreements (by integrating incentives for landowners to include agro-ecological requirements in rental agreements), or the attitude and knowledge of farmers (rising awareness of funding opportunities of receiving advice, and the benefits of implementing certain measures).

Analysis of MPIs

The preparatory desk research for the workshop identified 15 MPIs[4]. Figure A5 provides the rating of how the workshop attendees perceive the potential of the different MPIs to foster an agro-

[4] Most of the MPIs are already implemented policy instruments and measures of the Rural Development Programme in Lower Saxony co-funded by the EU. The specific regional label is in the planning phase and not yet implemented.

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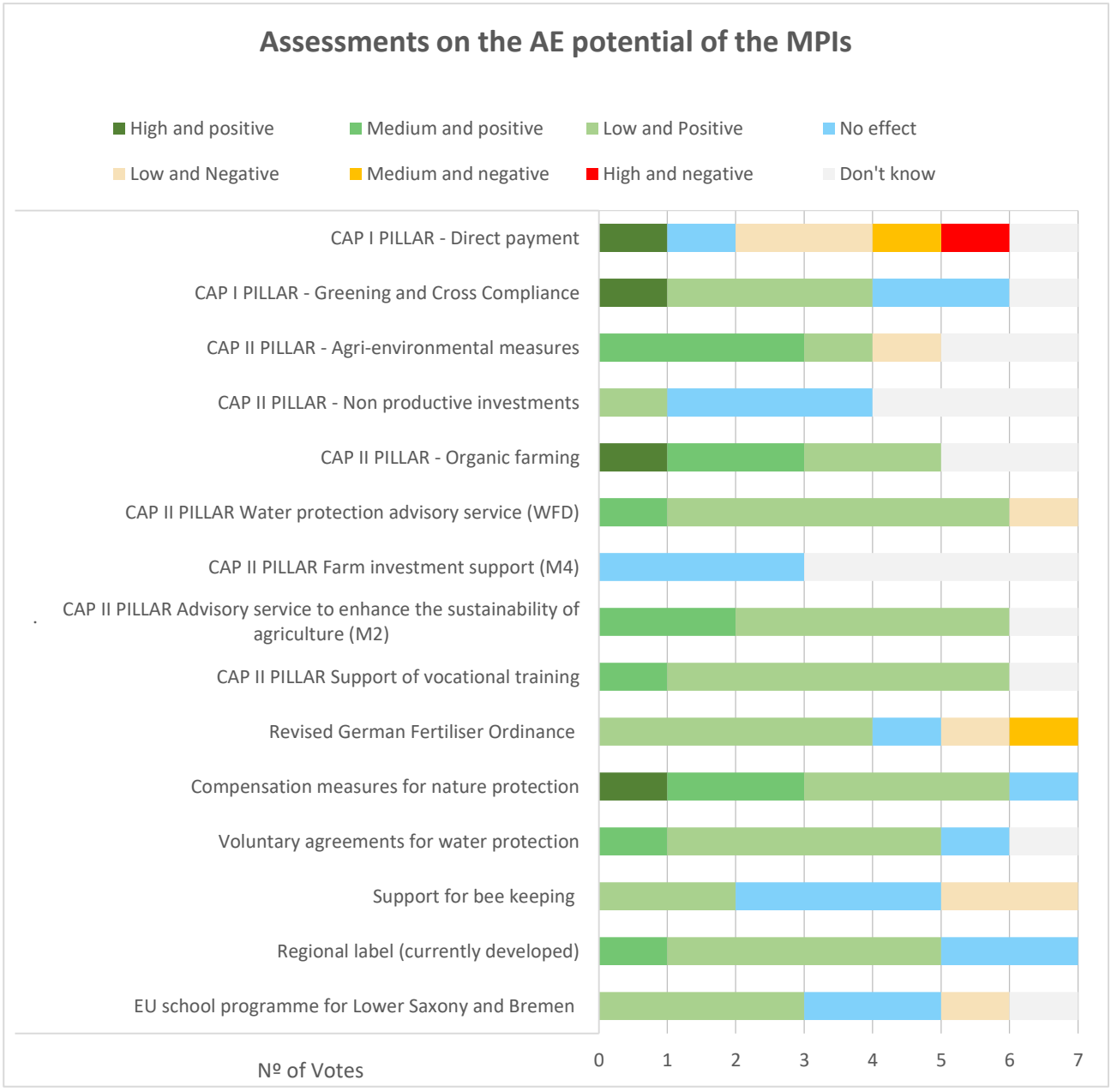
ecological transition in the case study area, based on the provided questionnaire. Even though the respondents perceive most of the shortlisted MPIs as having a (rather low) positive potential, some controversies are observable. For example, the perceived potential of the revised German Fertiliser Ordinance is diverse, which also reflects the current public debate on this MPI. At the time of the workshop, the revision of the German Fertiliser Ordinance was still ongoing.

Figure A5. Synthesis of questionnaire findings for the German case study.



The final score of the MPIs obtained from the **average score** of all individual votes was maintained in the case of 10 MPIs, but in the other 5 the subsequent debate led to a different **consensus score**.

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Consequently, the lowest rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **CAP I PILLAR - Direct Payment**	Low and negative
2. Support for bee keeping 3. CAP II PILLAR Farm investment support (M4) 4. CAP II PILLAR - Non-productive investments	No effect

Moreover, the best rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **CAP II PILLAR - Agro-environmental measures**	High and positive
2. CAP II PILLAR - Organic farming 3. CAP II PILLAR - Water protection advisory service (WFD) 4. **CAP II PILLAR - Advisory service to enhance the sustainability of agriculture (M2)** 5. **CAP II PILLAR - Support of vocational training**	Medium and positive

For the barometer exercise, five MPIs (those of the five that are included in the tables above are highlighted in bold) were selected to be discussed in more detail. The selection was made both by the facilitators, based on both the previous discussions and a short screening of the questionnaire replies, and by the stakeholders who were asked whether they have preferences. Please note that water protection advisory service, vocational training, and advisory service under M2 were grouped in the barometer discussion, as they cover different types of advisory service (e.g. to improve the sustainability of the production, specific advise for biodiversity friendly farming, and advise for the implementation of water protection measures in the context of the WFD).Here, we show the participants' opinions with the arguments for and against that arose during the debate.

CAP PILLAR I: Direct payments

Participants' opinions – Despite the discussion of direct payments led to less extreme opinions compared to the range which emerged from the questionnaires, no final agreement was achieved between the more farming- and more environment-oriented stakeholders in terms of whether the potential can be considered neutral or even negative.

Arguments in favour - A positive indirect potential of the direct payments was recognised because the payment is an essential source of income for farming businesses, particularly for family farms, many smaller farms would leave the market without the direct payments. Without the payment the share of large farms would increase which, in turn, also increases the plot sizes and reduces the boundary areas and landscape elements which have positive impacts on biodiversity.

Arguments against - Despite the positive aspects mentioned above, the potential of the direct payments is largely seen as negative by most stakeholders. The MPI consists of area-based

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payments which are distributed in a non-performance-oriented manner, i.e. without any environmental aims. The high proportion of the budget for direct payments means funds can't be used to support environmentally friendly practices ("public money only for public goods").

CAP PILLAR I: Greening and Cross Compliance

Participants' opinions – Due to no perceived potential of Cross Compliance for tackling agro-ecological transitions, the debate was centred on the Greening measures. Generally, it was largely agreed that this MPI has a low but positive potential.

Arguments in favour - Greening ensures a certain base level of biodiversity and water protection throughout all agricultural production areas. As one component of Greening, catch crops are perceived as being important for soil formation, water quality enhancement and climate impact reduction, and therefore improve biodiversity indirectly.

Arguments against - Despite addressing the entire scope of agricultural production areas, Greening measures only marginally contribute to an agro-ecological transition in general, and biodiversity and water quality enhancement specifically.

CAP PILLAR II: Advisory services including water protection advisory service, vocational training, and advisory service under M2

Participants' opinions – Advice in general was unanimously considered as key for facilitating an agro-ecological transition in the case study area.

Arguments in favour – The increasingly complex farming and policy systems imply that any farm requires highly specialised advice, i.e. "one does not fit it all". Advisory service can address the bureaucratic components of receiving, applying for, and complying with the regulations of funding and support payments and thus help to address that barrier.

Arguments against - Despite being essential to foster an agro-ecological transition, advice is not considered as being satisfactory in the case study area. For instance, it is not clear for all farmers that advice for more sustainable practices, including biodiversity enhancing actions, is fully funded through support measures. Hence, only few farmers take advantage of such advice. Moreover, there are too little financial means available and, thus, advisory services are understaffed and skilled advisors missing, particularly in the context of biodiversity. Consequently, the current contribution of advice for implementing agro-ecological practices is rather average, but its potential is perceived as being substantial.

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CAP PILLAR II: Agri-environmental measures (AEMs)

Participants' opinions – All stakeholders agreed that AEMs have great potential for both biodiversity enhancement and water protection which is, however, not yet utilised.

Arguments in favour – Agri-environmental measures are more targeted than Greening and foster more specific biodiversity aspects to reach substantial effects in ecosystem niches and address locally relevant stressors. Specific practices with known and validated biodiversity benefits or specific biodiversity results can be paid for.

Arguments against - While all stakeholders unanimously agreed on the highly positive potential of AEMs, the debate focused on why this potential is not harnessed. The aspects were thereby closely related to the barriers identified for the case study, namely too high bureaucratic burdens, and too low financial means for compensating the resulting extra efforts; a low degree of implementation flexibility; and a commitment for five years and one year in advance for the application process is not feasible for many farmers. The lack of flexibility together with penalties for making mistakes when implementing AEMs may impact negatively on the farmers' willingness of implementing other agro-ecological measures.

Revised German Fertiliser Ordinance

Participants' opinions – At the time of the workshop, the revision process of the Fertiliser Ordinance was still ongoing. Thus, the precise content and implications were not entirely clear during the discussions. Generally, the potential of the revised fertiliser ordinance towards supporting agro-ecological transitions is considered positive but rather marginal and, for instance, even below the potential of the Greening measures.

Arguments in favour – Some potential for biodiversity is identified due to no (e.g. in boundary areas next to streams and rivers) or less fertilisation. This might indirectly promote extensification which enhances biodiversity. A slightly larger potential is identified for protecting the quality of surface waters, whereas the effect for groundwater quality is only observable in the long-term. Reduced non-point emissions are also recognised as having a positive impact on the biodiversity in surface waters, but the effect is considered small as the ordinance only addresses boundary areas of water bodies and not the nutrient input through the drainage systems.

Arguments against - In contrast to the potential of promoting extensification, the revised fertiliser ordinance might also lead to reduced crop sequences due to cultivating certain crops with lower fertiliser needs in "red areas" and more fertiliser-intensive crops in areas without the newly introduced fertiliser reduction requirements. Moreover, farmers perceive the "across-the-board"-requirements of the ordinance as ineffective and not as a targeted long-term strategy which may increase their frustration and reduce their willingness to adopt other environmental-friendly measures. More farming-oriented stakeholders suggested to allow local adaptations rather than applying the ordinance on all areas including areas with lower water quality problems.

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How the instruments relate to drivers and barriers

Barriers addressed by the instruments so far – Pillar II instruments such as agri-environmental measures have the potential to address barriers such as the lack of knowledge of farmers of the requirements and benefits of agro-ecological practices and the lack of economic incentives for public good provision by supporting the transfer of knowledge about specific practices, including agricultural and income diversification. However, the potential of agri-environmental measures is currently not fully utilised for reasons explained under the next sub-heading. Advisory service, provided in combination with targeted agri-environmental measures, can enhance human capital and address the bureaucratic components of receiving, applying for, and complying with the regulations of funding and support payments and thus help to address that barrier. The barrier of land rental agreements that hinder or restrict the scope for implementing agro-ecological practices requires new types of instruments, e.g. environmental leases, which are currently not implemented. A key question to answer is how to incentivise and value land owners who promote the implementation of agro-ecological practices? The co-construction of transition strategies will explore the potential for a coordinated approach under the lead of the local authorities, e.g. by making landowners eligible for tax reduction if they set up agro-ecological rental agreements with farmers.

Drivers addressed by the instruments so far - Current channels of processing and trading do not differentiate between arable crops that were produced on farms that implement and follow agro-ecological or sustainability principles (other than organic farming certification). As a consequence, incentives and remuneration of "additional" agro-ecological benefits certified by a specific standard do not exist. A new pilot initiative has been created to develop a regional label for agricultural production with the aim to highlight local quality-related aspects. Under the concept "Together Growing" ("Zusammen wachsen"), representatives of County administrations and local communities are currently preparing the piloting of a regional label for locally produced agricultural products.

Effectiveness of MPIs

Issues that reduce the effectiveness of the effectiveness were identified for all discussed MPIs. For example, the CAP Pillar I has to some extent contributed to a more ecological farming approach in the EU by linking direct payments to the greening rules and via the cross-compliance rules. Despite addressing the full scope of agricultural production areas, greening measures only marginally contribute to a general transition to Agro-ecological Farming Systems, with limited contributions made to the improvement of biodiversity and water quality. The high proportion of the budget for direct payments means funds can't be used to support more targeted agro-ecological practices.
A key problem with agri-environmental measures is that those measures do not encourage changes in the attitudes of farmers and thus only have a limited impact on improving the ecological performance of the farm in the long term, and monitoring the impacts of those

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measures on the environment and ecosystems is not compulsory. High bureaucratic burdens, and too low financial means for compensating the resulting extra efforts; a low degree of implementation flexibility; and a commitment for five years and one year in advance for the application process is not feasible for many farmers. The lack of flexibility together with penalties for making mistakes when implementing AEMs may impact negatively on the farmers' willingness of implementing other agro-ecological measures. A result-based design, with the payment being based on actual improvements and verified results, would increase the flexibility for farmers and remunerate farmers for the services provided and results achieved.

Changing consumer expectations and growing awareness of the need for addressing biodiversity loss provide a possible scenario for changing purchase decisions of consumers. The development of the pilot initiative of the regional label "Together Growing" ("Zusammen wachsen") for locally produced agricultural products indicates an awareness for specific local (environmental) quality aspects that has been highlighted in MAP discussions as a potential strategy to also support the adoption of agro-ecological practices. This is at an early stage and it remains unclear to what extent such label can provide an effective market incentive for agro-ecological production.

Lessons learnt

Initiating a transition to agro-ecological farming will require support through both policy and market incentives. There is recognition amongst the key actors that a result-based policy can provide incentives to remunerate the environmental services of farming without the inflexible and often bureaucratic prescriptions and controls of the current CAP. But mechanisms and incentives are needed that a) support the creation of markets for agro-ecological production, b) address the important role and function of landowners and land rental agreements, c) foster long term changes in attitudes of farmers, and d) raise the awareness of the ecosystem services provision through farming. At the same time there is an understanding that strategies for agro-ecological transition need to promote knowledge generation and sharing on the benefits and option space of agro-ecological farming, also targeting vocational training and schools.

Several additional aspects were raised by the participants that were outside the direct scope of the policy analysis in this task but seem relevant for consideration in sub-sequent tasks and recommendations. These aspects included a discussion about the importance of food loss prevention that would allow reduced production quantity (at higher prices), the need for a food policy that explicitly integrates consumer aspects and incentives for landowners to include agro-ecological requirements in rental agreements. Preliminary options for incentives for landowners that were raised included community acknowledgement of ecological qualities of owned land and tax reductions for landowners.

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6. COLLECTIVE IMPLEMENTATION OF ALTERNATIVE PLANT PROTECTION PRACTICES IN PEACH TREES (IMATHIA, GREECE)

Data collection method: Workshop Option B reduced
Duration of the workshop: 2 hours
Number and profile of participants: 5 participants from Science, innovation, advisory, capacity building (2), Authorities and administration (1), Farmers and farmers' associations (1) and Agri-food value chain (1)

Key dilemma

How to sustain the long-term economic viability of farms whilst protecting the natural resources? How to protect biodiversity and water quality in orchards whilst also improving competitiveness and market access?

General overview of Drivers and Barriers

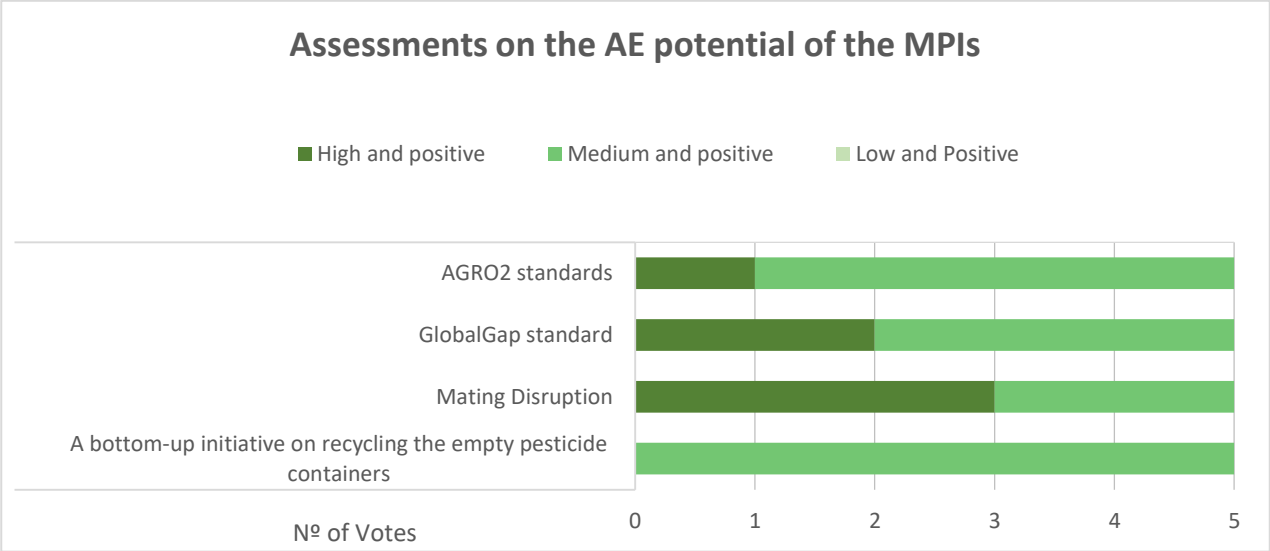
The area of Imathia is one of the two main production areas of peaches in Greece, both for fresh fruit production and processing. The challenge is to eliminate the use of chemical pesticides in fruit orchards and produce pesticide-free products of high quality.
The two main barriers of the agro-ecological transition are: the lack of social capital, that hinders the collaboration, mutual support and joint efforts between local actors; and a general feeling of mistrust in agricultural cooperatives/Producer Groups (PGs) due to ineffective and irresponsible management, since the majority of their leaders have occasionally acted opportunistically and linked to political parties maintaining clientelist relations between those actors who support them. Some other factors that explain the difficulty in overcoming the aforementioned barriers can be: economic factors as well as the ageing farming population and the lack of young people engaged in agriculture; a considerable number of agronomists who irrationally distribute and supply plant protection products, since many farmers are still typically conventional farmers detached from consumers' needs and market conditions; and the lack of research on agro-ecological practices, a poor development of plant protection products and farming solutions to be used in agro-ecology in Greece.
On the other hand, the increasing demand for food safety and quality as well as the compliance with the stringent levels of pesticides residuals on peaches imposed in the international trade can be considered as the main drivers towards more sustainable agriculture and food system.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 773901.

Analysis of MPIs

The preparatory desk research for the barometer workshop allowed the identification of 4 MPIs relevant for the key dilemma[5]. The questionnaire asked about the AE potential link of these MPIs. Figure A6 shows the participants' opinions on instruments.

Figure A6. Synthesis of questionnaire findings for the Greek case study.



According to participant's opinion, all these instruments are supposed to play in favour of the search for the dilemma that was investigated during the workshop. The table below shows the results, obtained from the **average of the individual votes**. Three of the four instruments, the ones highlighted in bold, were further investigated through the barometer. And below arguments for and against the initiatives are shown, based on the discussion that arose during the workshop.

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **Mating Disruption**	High and positive
2. **GlobalGap standard**	Medium and positive
3. **AGRO2 standards**	
4. A bottom-up initiative on recycling the empty pesticide containers[6]	

[5] The measures of CAP Pillar I are not important in the Greek case since up to the last CAP review, fruit farmers did not receive any subsidies apart from the ones the *Common Market Organisation (*CMO) for fruit and vegetables through producer groups implementing AGRO2. Furthermore, peach producers after a period of heavy dependence on subsidies are almost totally market oriented (see Greek SES analysis & storymap). This may explain the few policy instruments that apply to the Greek case.

[6] Regarding the fourth MPI, the written vote of all the participants was not obtained, however, during the debate everyone agreed that this initiative is a good way to encourage local farmers to have responsible waste management, so its link with agro-ecology was verbally agreed and ranked as medium and positive.

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Mating Disruption

Participants' opinions - This method is considered of high relevance and significant importance to sustainable farming. The application of Mating Disruption method (i.e. insect sexual confusion methods for pest control) is an environmentally friendly pest management technique which aims to gradually abolish the application of chemical insecticides, without excessive damage to biodiversity and degradation of water quality in the tree orchards. A cross-disciplinary group of key experts played a vital role in suggesting, drafting and implementing this method as an agri-environmental scheme under the current Greek Rural Development Programme (2nd pillar of Common Agricultural Policy). It is an effective instrument for pest management; thus, it can only be a step towards the agro-ecological transition pathway.

Arguments in favour - The measure has as a specific targeted objective, rendering the measure easy for application. The reduction in the use of chemical insecticides makes the final products be more competitive in the market. It is the first time that farmers have been informed that specific harmful pests of peach trees can be controlled without spraying, and they have been trained in such a method. Farmers hang the dispensers on tree branches, instead of spraying. This instrument has changed the viewpoints of farmers about spraying, because the method works in practice. Farmers communicate the positive results of this innovative method to other farmers.

Arguments against - Despite the positive results, the adoption of the method is still low. The limited communication and awareness raising among local actors, especially to farmers, was mentioned as the main barrier of its restricted adoption. Given that its effectiveness is determined by and highly dependent on participation rate, the scheme can be considered ineffective.

GlobalGap standard

Participants' opinions - The GlobalGap standard is a business to business (B2B) quality certification scheme that ensures the application of good agricultural practices (GAP). It is a key instrument to support the farming and food chain transition promoting the rational management of natural resources as well as food safety, but with limited focus on the ecological aspects on farming process. It is not a system promoting training, co-operation and communication among farmers, but it is rather a framework agreed mainly by big retailers worldwide and is prerequisite in order to gain access to supermarket retailers, in case of certain fresh products-exports.

Arguments in favour - The requirements of GlobalGap standard are more specific compared to other standards (such as AGRO2) and its certification is globally recognised. Thus, it is the basis for the implementation of enhanced environmentally friendly practices guiding farmers towards sustainable farming. It has an important influence on the sector of intermediaries and retailers who started to follow a standard management procedure when they receive, distribute, export and/or trade agricultural products, consequently they are considered responsible for the quality and safety of the product.

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Arguments against - It has a weak ecological effect limiting environmental requirements beyond the mandatory standards and focuses more on the final product quality and consumers' safety. It doesn't provide a quality product labelling that can inform consumers.

AGRO2 standards

Participants' opinions - This is a key instrument to support the farming and food chain transition reducing the environmental impact of agricultural activities. In Greece the implementation of Integrated Farming (which is an environmentally friendly farming method that controls the use of fertilisers, pesticides and irrigation) is certified against the two national standards of AGRO2. These standards aim to improve environmentally friendly practices in agriculture. They ensure rational management of the whole production process, record keeping, products' traceability system, safety procedures for farmers, etc.

Arguments in favour – It satisfies the demand for safe and quality products. AGRO2 forces farmers to comply with these environmental standards, since its certification is considered a prerequisite if farmers wish to improve their competitiveness in the marketplace. Since 2000, its implementation has resulted in a considerable reduction of chemical input use in the case study area, especially around the harvesting period, as a consequence of following the farming guidelines and directions issued by crop protection experts and thus comply with a precise programme of plant protection products (e.g. specific type of insecticide, appropriate dosage, keeping track of the Pre-Harvest Interval).

Arguments against - AGRO2 has general requirements for the application in crop production and doesn't achieve continuous and measurable improvements. Thus, environmental improvement towards specific and measurable goals cannot be set. The certification cannot evaluate and track the progress towards specific and measurable improvements. Moreover, it doesn't concern the product, but only the production process.

How the instruments relate to drivers and barriers

Barriers addressed by the instruments so far - The Mating Disruption method and AGRO2 standards address two of the main barriers identified. On one hand they attempt the barrier of lack of social capital, because these instruments increase awareness about sustainable farming, disseminate information and organisation of training activities and seminars on new agricultural practices and technologies. On the other hand, they address the barrier of lack of confidence and trust in agricultural cooperatives, because the instruments need the collaboration among groups of agronomists-consultants and pioneer leaders in strong and large agricultural cooperatives who are aware of market demands and open in innovation.

Other barriers, such as the considerable number of agronomists acting as merchants (by distributing and supplying plant protection products), as well as the lack of research on agro-ecological practices in Greece, have not been directly tackled by the analysed instruments.

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Drivers addressed by the instruments so far - The driver of the increasing demand for food safety and quality is addressed by the implementation of integrated faming through the Greek AGRO2 standards and/or the GlobalGap standard, and the application of Mating Disruption method.

Effectiveness of MPIs

The market and policy instruments can be effective when they have clear and explicit requirements with easily achievable and measurable targets, so that farmers recognise the results and the progressive improvements, thus gain confidence in the instruments and continue to further adopt agro-ecological farming practices.
It is important that both market and public authorities acknowledge the multiple roles of farmers in society and compensate them either by providing financial support and/or offering premium prices for producing safe agricultural products as well as environmental public goods.
The application of market and policy instruments relevant to agro-ecological farming practices should be accompanied by an effective farm advisory system, since farmers need support, guidance and expertise when applying innovative farming practices.
When the implementation of the instruments is firm and monitored, farmers as well as agronomists-merchants have no other option but to comply with the specific requirements. Thus, the management board of the agricultural cooperatives as well as all involved in the agri-food network are responsible for the effective implementation of such instruments and should explicitly support and promote them.

Lessons learned

The selection of the participants and the workshop was considered successful. All participants were well experienced and familiar with the market and policy instruments implemented in the case study area as well as its socio-economic and environmental context. Thus, there was a lively and spontaneous discussion in which everyone clearly expressed and shared their points of view revealing valuable information on the topic discussed.
It is acknowledged that only collective schemes could effectively coordinate the transition towards agro-ecology. Market and policy instruments may alleviate the barriers when social networks rely on trust and goodwill, knowledge and information sharing as well as open-minded actors who fully aware of market demands.

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7. SOIL CONSERVATION FARMING (HUNGARY)

Data collection method: Workshop Option B
Duration of the workshop: 2 hours
Number and profile of participants: 8 participants from Science, innovation, advisory, capacity building (2), Authorities and administration (3), Farmers and farmers' associations (2) and Agri-food value chain (1)

Key dilemma

How to integrate agro-ecological practices on arable land in highly market-oriented arable farming systems to maintain and improve soil quality without significant negative impacts on the economic viability of farms?

General overview of Drivers and Barriers

Soil conservation farming practices appear to be viable among market conditions at the present. The technology is available for farmers with adequate capital. Farmers have indirect environmental awareness, driven by the realization of economic benefits from environmental interventions. In our opinion, this attitude of farmers can be considered as the main driver in the spread of soil conservation farming. Environmental issues seen by the current government as key barriers to economic growth, have been systematically suppressed, thus too many positive changes in soil conservation farming as environment protection technology cannot be expected. However, environmental and climatic expectations are expected to increase in the next cycle of the CAP, which may force a change in the current political stance. The lack of networking between stakeholders and the lack of appropriate expertise, and insight from the part of policy makers are additional key barriers to the diffusion of soil conservation farming in Hungary.

Analysis of MPIs

The preparatory desk research for the barometer workshop allowed the identification of 12 MPIs. During the workshop, the participants pointed out the 10 most relevant MPIs for the case study, 3 of which were added to the questionnaire and voted by the participants. Therefore, in this workshop 15 MPIs were analysed[7].

[7] The 7 MPIs identified during the workshop (but not analysed in this task) were: GEO008: CAP post 2020; G008: Law on the protection of soils; G006: if agri-food value chain could support soil protection projects; G006: if there was a national soil conservation platform; G017: compensation for farmers to compensate damage by natural factors; G12: eliminating lands under undivided joint ownership; and G12: land consolidation. Identification of these MPIs may be useful in future UNISECO tasks.

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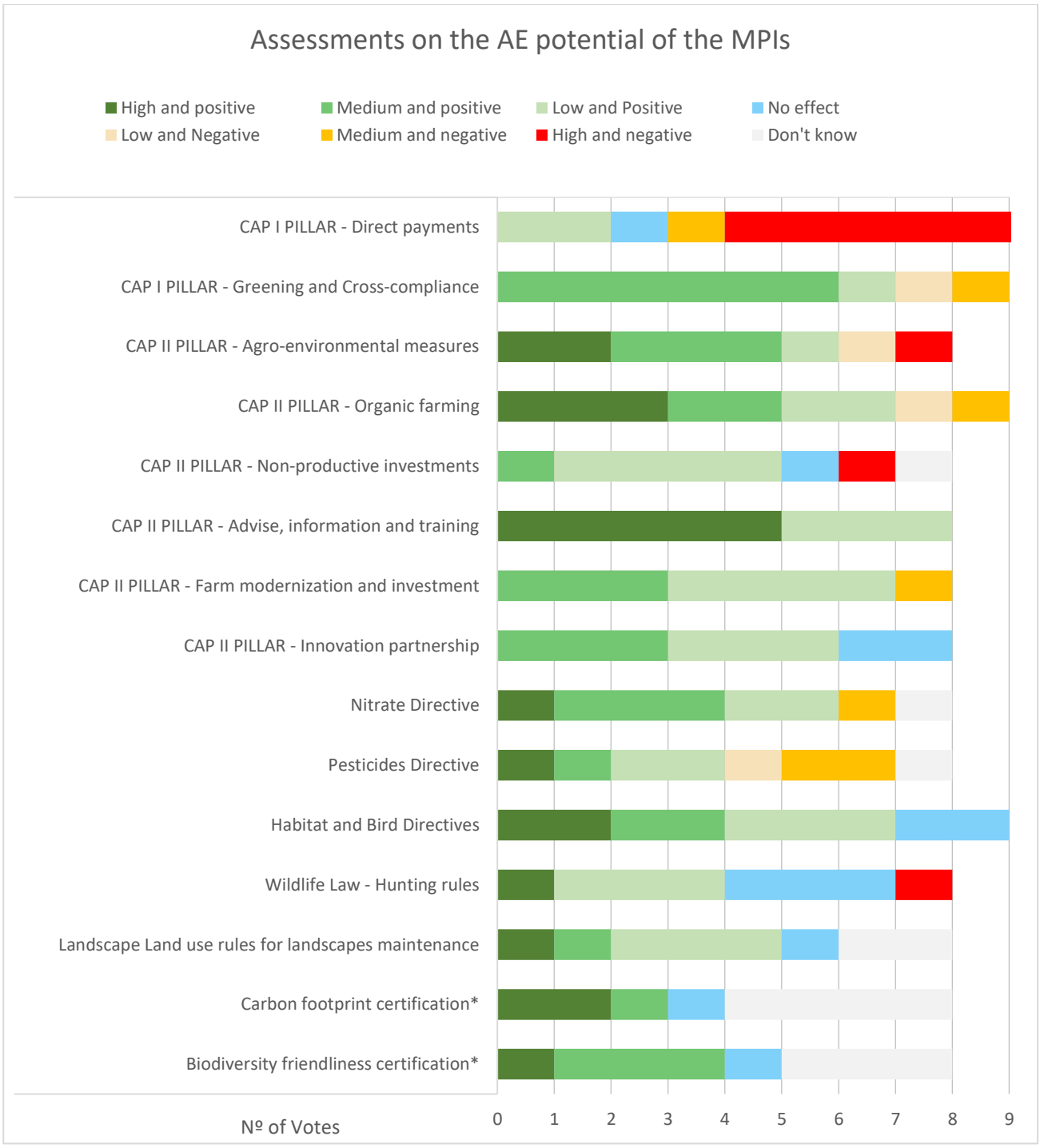
The participants were asked to rank the importance of all MPIs in contributing to promoting/hindering soil conservation farming. The results of the questionnaires show stakeholders' agreement about the positive effects of most measures (Figure A7). Some disagreement was registered towards 4 MPIs (CAP PILLAR I – Direct Payments, CAP PILLAR II – Agro-environmental measures, CAP PILLAR II – Non-productive investments, and Wildlife Law-Hunting rules).

Figure A7. Synthesis of questionnaire findings for the Hungarian case study.



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The final scores, obtained from the **average of the individual votes**, show that the lowest rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **CAP I PILLAR – Direct payments**	Medium and negative
2. Pesticides Directive 3. Wildlife Law – Hunting Rules[8]	No effect

Moreover, the best rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **CAP II PILLAR – Agro-environmental measures**[9] 2. **CAP II PILLAR – Advise, information and training** 3. Carbon footprint certification	Medium and positive

Participant's opinions about MPIs were collected and discussed during the barometer exercise. Below we show the main arguments that were given when analysing 4 of the most relevant measures for the case study (three of them are highlighted in bold above).

CAP PILLAR I – Direct payments

Participants' opinions - This instrument has little positive potential, due to the rather negative experiences of participants. There was a consensus that currently these payments are very important and help many farmers to stay viable, but with various adverse effects which lead in the mid-run into the transformation of direct payments into other instruments.

Arguments in favour – Direct payments support farmers' income.

Arguments against – It does not encourage in general the spread of more sustainable farming systems. In Hungary it is an area-based aid (SAPS), adherence to this shall be gradually given up both at producers' and political level. It creates market and social distortions, by farmers getting addicted to reliance on public support.

[8] Hunting rules were evaluated very differently by experts. The most important thing in this case is to highlight that its effect depends on the specific context/territory. In some context the effect can be very negative and in others, neutral or positive.

[9] During the subsequent discussion it was said that in the case of "CAP policies" (specifically, Direct Payments, Greening and Agro-environmental measures) the actual effect of the measures is less than their theoretical potential, since they would be more positive if they were better designed or implemented. That is why in the case of "CAP II PILLAR - Agro-environmental measures", although the **average result** was "low and positive", the experts agreed to increase its score to "medium and positive".

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CAP II PILLAR - Agro-environmental measures

Participants' opinions - This instrument has medium positive potential in relation to the case study dilemma. It has a large potential, but the current way of implementation cannot fulfil the aims which were initially set in the background design.

Arguments in favour - This measure is good in HNV areas; there is much greater willingness / co-operation between the actors in these areas, and additionally farmers received some training.

Arguments against – Farmers perceive the measure as a subsidy and are not really concerned with the rationale behind the requested agricultural practices. Then, often they lack the knowledge to adequately implement the practices. Other serious problems are excess bureaucracy and not accurate checks on farm eligibility criteria at the application stage.

CAP II PILLAR - Advise, information and training

Participants opinions – Although not much have been achieved so far through this instrument its potential is crucial regarding the future spread of soil conservation practices. This instrument has medium to low positive potential in relation to the case study challenge.

Arguments in favour - informing farmers is a basic need: if they understand the reason why there are these management prescriptions, they do it.

Arguments against - state education in agronomy does not follow international practices and innovations - there is a lack of a modern approach that addresses these issues holistically.

CAP I PILLAR - Greening and Cross-compliance

Participants' opinions - This instrument has medium to low positive potential in relation to the case study dilemma. It is obligatory for every farmer who take direct payments thus its coverage is much larger than e.g. organic farming schemes.

Arguments in favour – it encourages a change in producer approach, realizing agri-environmental measures require higher level knowledge input from farmers while these management prescriptions help to introduce the implementation of existing soil conservation farming prescriptions

Arguments against - farmers are still not conscious enough to use it, more information, knowledge transfer is needed, it is rather one-dimensional and therefore cannot bring all the intended benefits

How the instruments relate to drivers and barriers

The relation of instruments to drivers and barriers was not addressed during the workshop. It is the summary of our expert opinion that neither the drivers nor the barriers are directly and explicitly tackled by any of the instruments in the form as they are currently implemented.

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Barriers addressed by the instruments so far - There are two main reasons for the impediment to the widespread adoption of the soil conservation farming practices. On the one hand, due to the traditions and customs of arable farming, most farmers regard ploughing as an essential and inherent part of soil cultivation. Farmers who have acquired their farming knowledge in the past (decades ago) may have heard at most of the dilemma of ploughing in the fall or spring, but an arable land not being ploughed at all was simply not part of education in former times. On the other hand, it also complicates the spread of soil conservation farming that there is a lack of full consensus on the benefits and usability of the soil conservation farming practices and technology as there was - and in some cases there is still now - concerning arable farming and ploughing.

There are attempts to address some of the obstacles, we highlight especially a group of pioneering farmers who have actively worked together to advance soil conservation and soil regenerative farming. In addition, initiatives have been taken also by other stakeholders, e.g. initiatives by the National Chamber of Agriculture (Farmers' Academy on soil conservation) or private companies (e.g. the Contivo programme of Syngenta). We also emphasize that, despite 2015 was declared the International Year of Soils worldwide and the soil theme was published in many places, this is unfortunately still not enough to achieve a minimum level of social awareness.

Drivers addressed by the instruments so far - Soil conservation farming practices appears to be viable - in a subsidy-free environment - among market conditions only. The technology exists and there is money to implement this technology - of course, the latter is true mainly for capital-intensive entrepreneurs. Perhaps the most important experience gained from the case studies is that if an environmental intervention - in our case soil-conservation farming - can produce market benefits, then farmers are indeed very keen and willing to apply it. They have indirect environmental awareness, undoubtedly driven by the realization of economic benefits from environmental interventions. As a result, they continue to be profit oriented, but they recognized that a targeted handling of the environment could positively affect their profits. In our opinion, this attitude of farmers can be considered as the main driver in the spread of soil conservation farming.

Effectiveness of MPIs

Soil conservation farming is a relatively new topic in Hungary, the current phase focuses on raising awareness of problems rather than solving them. Planned policies are not aligned with appropriate tools (especially at the level of information, education, training) for practical implementation.

Experts have considered direct payments to be the worst measure for soil-friendly farming due to its bipolar but predominantly negative impact. At the same time, agri-environmental measures were found to be the best instrument if they were accompanied by adequate, well-defined content and effective enforcement, specifically focused on soil protection.

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Since soil conservation farming is linked to agricultural production functions, market mechanisms can also help its operation, since the choice of technologies and the financing of the necessary investments can be realized without subsidies.

Lessons learned

The farm level case studies have provided a good example of the existence of a series of barriers to the adoption of soil conservation among farmers in the CS area. Notably, farmers have rather different understanding of soil conservation farming probably because of the lack of professional consensus. There was a farmer who used this terminology even if he only happens to sometimes replace ploughing. Others manage their farms completely without ploughing. Assessing the efficiency of soil conservation farming practices is therefore difficult as even its indicators are not clear. As a result, our farm level investigations could primarily demonstrate the potential of soil conservation farming practices, undertaken mainly with the tools were already available.
The main lesson learned during the workshop and during the preceding expert interviews was the need for a common professional platform with participants from all sides. We also emphasize this because the main problem is the isolation of stakeholders, the inadequate flow of information. This would be the first and foremost step that could help and make concrete the various forms of cooperation between stakeholders.
Main points of consensus among participants were about the existence of potentially useful MPIs that however are not working properly, the need for the creation of a professional platform and the existence of wider problems, at the agricultural system level. Participants disagreed largely on the most cost-effective policy approach to the promotion of soil conservation farming.

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8. DIVERSIFYING SPECIALISED WINEGROWING AREAS (CHIANTI BIODISTRICT, ITALY)

Data collection method: Workshop Option A reduced
Duration of the workshop: 3 hours
Number and profile of participants: 6 participants from Science, innovation, advisory, capacity building (3), Authorities and administration (1), Farmers and farmers' associations (1) and NGOs, civic society organisations, local community representatives (1)

Key dilemma

How to promote cropping system diversification in a highly specialised and market-oriented winegrowing area via the adoption of agro-ecological practices, to increase biodiversity and improve landscape management while maintaining the profitability of farming through local value chains.

General overview of Drivers and Barriers

The notoriety of the wine produced in the region is a lever for the rural tourism thanks to which the demand for other valuable typical products is increasing. However, the revenue obtained by producing wine outweighs the opportunity offered by the increasing demand for other typical products produced locally. More is needed to tackle the challenge. Most of the initiatives to face the challenge are addressed by citizens. Local administrations provided the regulation needed to formalise new associative forms like the Rural District and the Biodistrict, also by strengthening the role of citizens and local businesses in promoting initiatives that benefit the entire community.

Analysis of MPIs

The preparatory desk research for the workshop allowed the identification of 14 MPIs related to the key dilemma. During the workshop, the questionnaire about the relevance of the 14 MPIs for addressing the dilemma highlighted stakeholders' agreement about the positive effects of most measures (Figure A8). No great disagreement emerged towards given MPIs.

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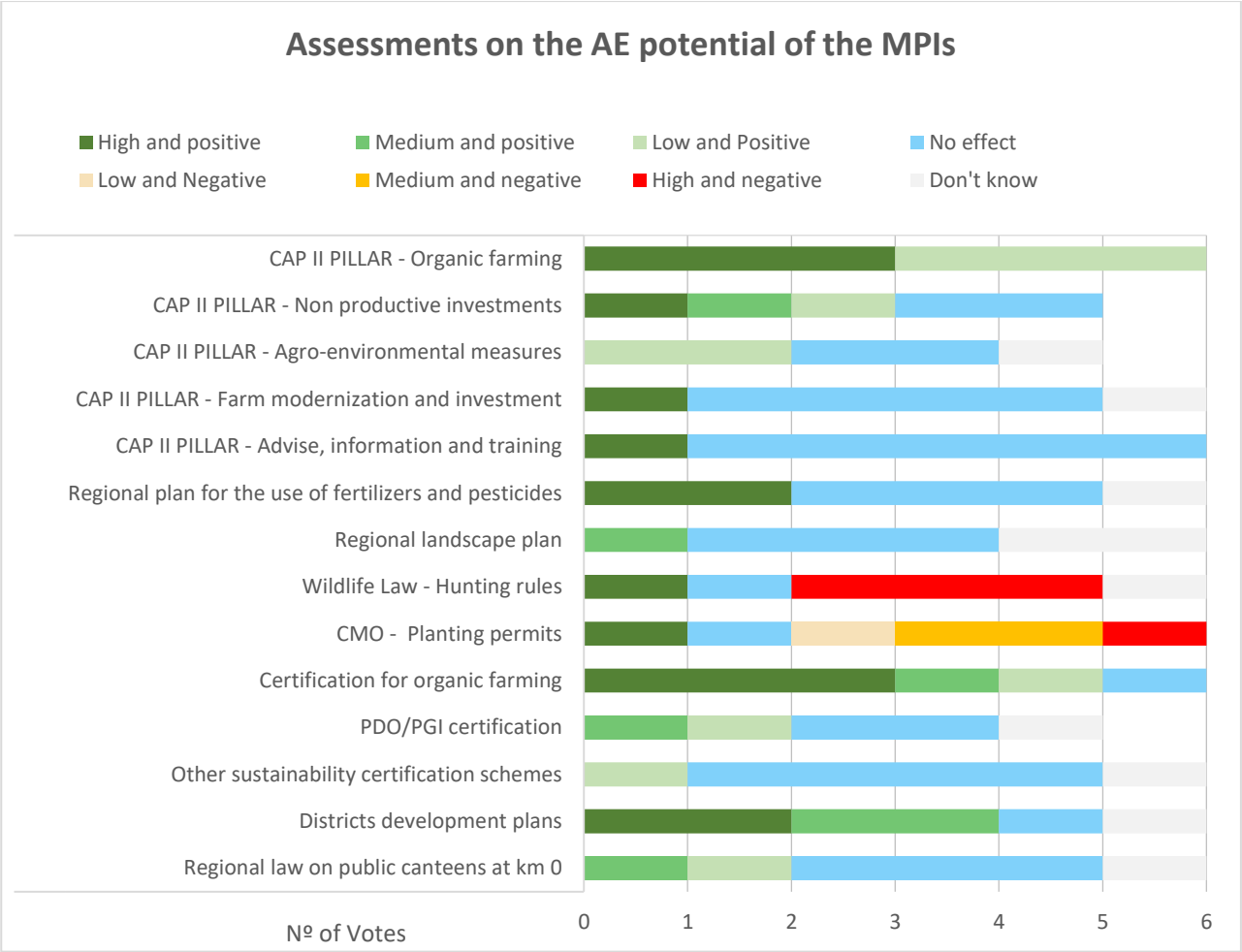
Figure A8. Synthesis of questionnaire findings for the Italian case study.



In this case study, the individual votes expressed through the questionnaire were only indicative of the different positions regarding the positive or negative influence of these MPIs. After this exercise, participants held a round table discussing most of the instruments and they agreed on the final score.

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According to that **consensual score**, the lowest rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **(Other) Sustainability certification schemes** 2. CMO - Planting permits	High and negative
3. **Wildlife Law – Hunting rules**	No effect

Moreover, the best rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. Districts development plans 2. CAP II PILLAR – Non-productive investments 3. CAP II PILLAR – Agro-environmental measures 4. **CAP II PILLAR - Advise, information and training** 5. **Regional landscape plan**	High and positive

Then, the moderator made the decision about MPI selection for the barometer discussion based on a quick voting round among participants. Finally, 4 MPIs (those highlighted in bold) were analysed in depth. Below we show the participant's opinions about their weaknesses and strengths.

(Other) Sustainability certification schemes

Participants' opinions - A consistent number of existing sustainability certification schemes hinder the transition, because these instruments are mostly designed to support large companies to control the market without bringing any appreciable benefit to the environment and to the society. Nevertheless, organic certification makes the difference because it clearly differs from other types of sustainable certification schemes. However, the organic certification alone is not enough effective and more restrictive schemes are needed to better differentiate the product obtained with organic farming techniques.

Arguments in favour - Growing citizens' awareness on food – environment – health.

Arguments against - The growing number of sustainability certification schemes may create confusion amongst consumers, with the consequence of damaging more than supporting sustainable production models. Artificial needs (induced by marketing operations) can overcome real needs by jeopardizing the sovereignty of the citizen.

Wildlife Law - Hunting rules

Participants opinions - The instrument is not well design, with a consequent uncontrolled presence of wild animals that hinders the possibility to grow arable crops in the proximity of forests. However, although the wildlife law is badly design and it needs to be improved, it only

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partially affects the transition since there are other and more serious reasons explaining the poor diversification of the local agricultural system.

Arguments in favour - The presence of wild animals contributes to strengthening agricultural land abandonment processes.

Arguments against - Wild animals are not the primary cause of agricultural land abandonment. Also, the Law do not provide the necessary instruments to control wild animals.

Advise, information and training

Participants' opinions - The RDP measure (M2-Advisory services) that should support the advisory service is not active because not funded yet. Besides that, there is a need to revise the mechanisms of incentive used by the Regional Management Authority. Many small farms do not benefit from advisory services for economic reasons, even when advisory services are subsidised by the public authority. In addition, the quality of the service should be improved and extended to face emerging problems beyond the farm level to support the development of local supply chains.

Arguments in favour - farmers need advises to reduce the bureaucratic burden and to drive technical and market strategic choices. Advisory is particularly needed to spread new concepts and management practices among the community of farmers and other operators in the region.

Arguments against – the cost of advisory services may lead to the consequence that only a minority of farmers can access to it. As a result, those farmers that most need to use advisory services do not have access to them.

Regional landscape plan

Participants' opinions - The regional landscape plan is crucial in driving the transition, but the way the Plan is implemented hinders the transition. The plan does not offer the required instruments to control land use changes. Therefore, the high real estate value of the buildings located in the territory attracts investments with both positive and negative effects. The negative effects are associate to the deterioration of the landscape and to the lack of agricultural workers on the spot market because of the increasing cost of life that contribute favouring the progressive abandonment of marginal agricultural areas. In addition, there is lack of connection between the landscape plan and other implementation policies. Namely, the plan identifies the threats and the measures to counter them but does not offer any practical guideline on how to implement the measures with the consequence that local authorities (Municipalities) have a lot of discretion in implementation choices.

Arguments in favour - The notoriety of the Chianti region makes it very attractive to investments, especially for residential purposes. This fact led to a change in the use of rural buildings with sometimes negative consequences for the landscape and also on the quality of life.

Arguments against - The instrument is not well design as it leaves much discretion to local municipalities that are usually more influenced by local interests, which may be in contrast with the wider environmental and social priorities.

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How the instruments relate to drivers and barriers

Barriers addressed by the instruments so far - Comparatively low profitability of products other than wine and limited development of local supply chains. Such barriers were addressed by the public canteen Law (green public procurement), together with the payment for organic farming, the payment for farm modernization and the simplification law to reduce the bureaucratic burden for those farmers that transform the product in the farm. Poor human capital in agriculture, high bureaucratic burden for entrepreneurs can be addressed by improving the advisory services, but unfortunately the related RDP measure is currently not implemented.

Drivers addressed by the instruments so far - Development of associations around agro-ecological issues and, through them, growing citizens' awareness on food - environment – health issues. Such drivers where powered by the Regulation issued by the Regional Body on the Rural District and the Biodistrict. In doing so, The Region triggered a rebound effect thanks to which the citizens themselves designed many of the development initiatives, and then promoted by the Region itself. A striking example is that of the simplification law (Regional Law 12/2018), lightening some rules for small producers who want to transform agricultural productions within the farm and the public canteen law.

Effectiveness of MPIs

Most of the discussed instruments, although relevant to tackle the transition, where not considered enough effective. The most important criticisms around the effectiveness of the policies were expressed in relation to the wildlife law, the landscape plan, the payment for organic farming, the RDP measure on advisory services, the payment for unproductive investments and sustainable voluntary certification schemes. The wildlife law is old, and the instruments conceived in the law are obsolete. The law needs to be updated including other more effective available instruments. The landscape plan is incomplete as it describes the threats, it offers the solutions, but it does not offer any indication on how to implement the suggested measures letting the measure be applied at the free discretion of the responsible bodies (Municipalities). The payment for organic farming should be linked to effective environmental improvements and it should be focused on innovative practices. Only farmers in conversion should obtain subsidies, differently from the current criteria which include payments also for farmer that are already organic. The payment for advisory services should be reparametrized as many small farms do not benefits of advisory services because these are too costly, even when subsidised by the public authority. The payment for unproductive investments is not sufficiently targeted. A better integration between tools and needs of the territory is required. Voluntary certification schemes are usually designed to accomplish with the market interests of large companies, without necessarily promoting more sustainable practices.

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Lessons learned

Participants expressed broad consensus for most of the instruments required to pursue the transition. Difference of opinions emerged with respect to the wildlife law, considered detrimental to the transition by most of the participants and not effective at all by the NGO's representative.
The AE transition can be pursued by implementing an integrated strategy supported by regulations, financial instruments and contractual instruments. The success of the transition depends on the synergies activated between the analysed instruments and in the eligibility and incentive criteria used to make more effective the necessary policy mix (further details in Annex 3). The transition can also be promoted including few non-existing additional instruments as: 1) An Integrated Supply Chain Plans to promote local supply chains and the market; 2) Policies to sensitize the consumer; and, 3) Policies to support the development of Brands.
The lack of some key players may have influenced the workshop results with the risk of getting a skewed picture of the analysed issues.

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9. ORGANIC DAIRY FARMING (LATVIA)

Data collection method: Interviews Option C
Duration of interviews: 1-2 hours
Number and profile of interviewees: 5 interviewees from Science, innovation, advisory, capacity building (3), Authorities and administration (1) and Farmers and farmers' associations (1)

Key dilemma

How to increase the economic viability of conventional and organic, largely grass-based, dairy farms while preserving biodiversity in grasslands and water resource quality? How to ensure that all organic milk is processed into organic dairy products?

General overview of Drivers and Barriers

There are seven barriers and two drivers related to the transition to agro-ecology as related to the dilemma. The barriers are: the lack of advisory services knowledgeable and skilled in agro-ecological farming practices; low level of mechanisation and outdated infrastructure on organic dairy farms, which makes the reduced productivity and dairy farming not appealing to the younger generation of farmers; logistical challenges for the collection of organic milk from dispersed organic dairy farms and delivery to organic dairies, with increased costs; low price paid to farmers by logistics companies and dairies for organic and conventional milk; market limitations, with a limited demand, availability and visibility of organic dairy products in the local retail market; consumer attitudes and willingness to pay, limited consumer information regarding the higher quality and benefits of organic dairy products; and the lack of a national organic strategy including rules for public procurement of organic dairy products.
On the other hand, the agro-ecological transition is being driven by the CAP PILLAR II support for transition to and maintenance of organic farming practices, as well as the longstanding tradition in Latvia of ecological dairy farming without the use of mineral fertilizers and chemical pest control.

Analysis of MPIs

The preparatory desk research for the interviews allowed the identification of 16 MPIs related to the key dilemma. The interviewees evaluated the effect or influence of these market and policy instruments on agro-ecological transition, according to their knowledge and experience. The questionnaire results highlighted stakeholders' agreement about the positive effects of most measures

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Figure A9). The main discrepancies were around the measure National food quality scheme "Green Spoon" and "Bordeaux Spoon".

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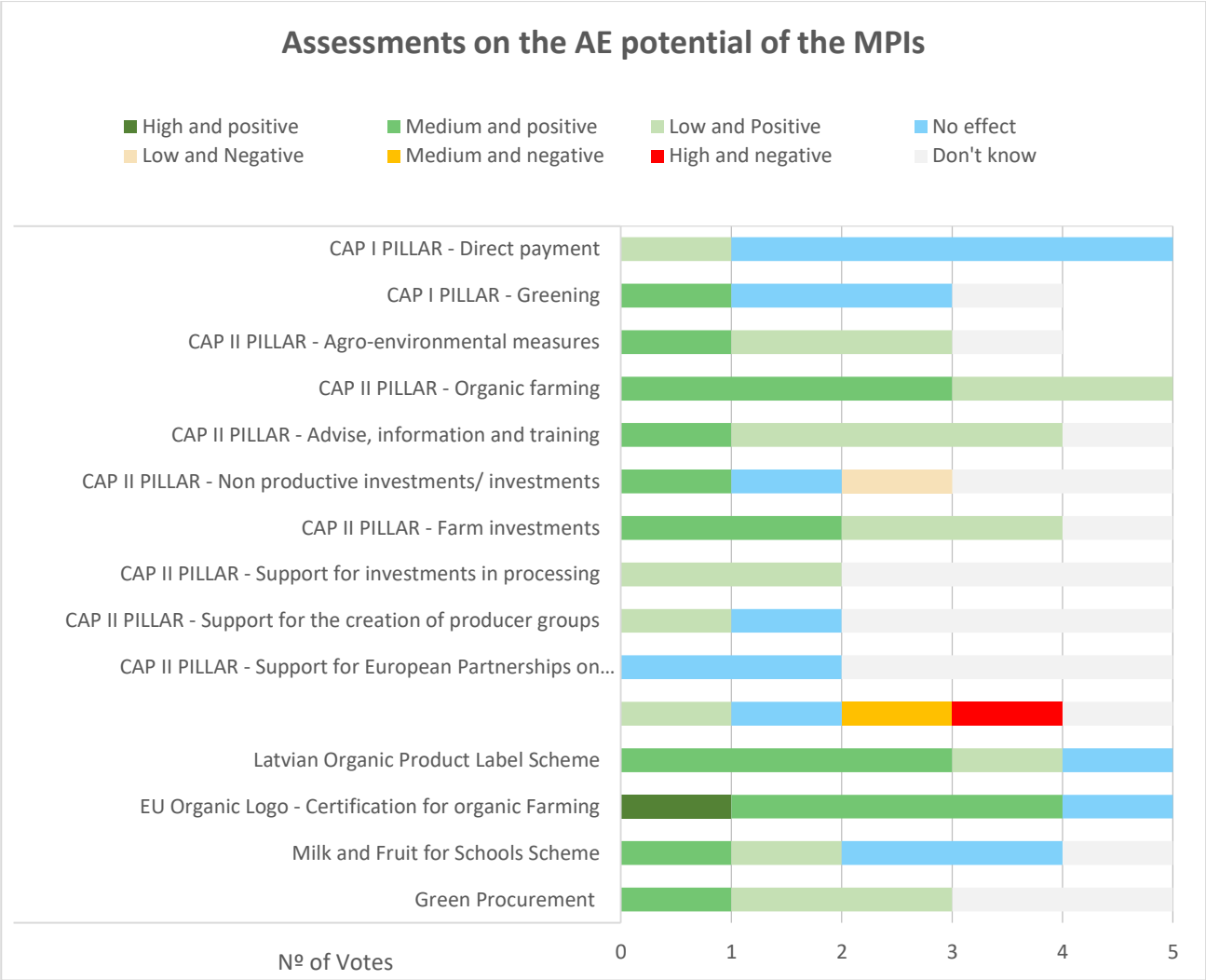
Figure A9. Synthesis of questionnaire findings for the Latvian case study.



The final scores, obtained from the **average of the individual votes**, show that the lowest rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **National food quality scheme "Green Spoon" and "Bordeaux Spoon"**	Low and negative
2. CAP II PILLAR – Support of European Partnerships on developing innovations 3. **CAP II PILLAR – Direct payment**	No effect

Moreover, the best rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **EU Organic Logo - Certification for organic Farming** 2. **CAP II PILLAR - Organic farming** 3. **CAP II PILLAR - Farm investments**	Medium and positive

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Later, nine instruments (5 of them highlighted in bold above), were further analysed during the interviews. Here, we show the participants' opinions on the strengths and weaknesses of these instruments.

National food quality scheme Green Spoon/ Bordeaux Spoon

Arguments in favour - The scheme encourages production and processing of agricultural and food products with higher quality criteria that go beyond those specified by EU and Latvian regulation on general requirements for animal and plant products. The scheme promotes consumption of locally grown and produced products.

Arguments against - Environmental criteria related to production are not defined. Due to its high recognition factor amongst consumers, the "Green Spoon/ Bordeaux Spoon" scheme products compete against Latvian Organic Product Label and EU Organic Logo products. "Green Spoon" products are positioned as being environmentally friendly and mistakenly perceived by consumers to be organic.

CAP PILLAR I Direct Payments and Greening

Arguments in favour - The "greening" instrument encourages farmers to think and act in an environmentally friendly way. Diversification of crops improves soil quality; Ecological Focus Areas help to protect and improve biological diversity and perennial grassland is a valuable biotope that provides habitat for many bird species. "Greening" support does not require additional actions to be taken by certified organic farms and areas.

Arguments against - CAP PILLAR I Direct payments do not by themselves contribute to a transition to AEFS. Presently, a measurable effect in relation to a transition to agro-ecology is not demonstrated by this instrument.

European Certification for Organic Farming: EU Organic Logo

Arguments in favour - It improves recognition of organic products.

Arguments against - It is thought that insufficient publicity limits its effectiveness in stimulating organic dairy consumption by consumers.

CAP PILLAR II Organic Farming Support

Arguments in favour - It is the main driver for agro-ecological transition from conventional to organic farming practices in Latvia (although not for all actors). Presently, about 5.5% of all dairy cattle are certified organic and more than 10% of all produced milk is organic. The transition to organic farming has been to a large degree driven by available CAP and RDP support, which accounts for as much as 50 % of the income of organic farms.

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Arguments against - Support payments are area-based and are not linked to milk production. Although payments for organic farming are higher than for conventional farming the share of agricultural land dedicated for organic farming is still rather low. The payments do not always sufficiently compensate for income lost due to more costly organic production. Organic certification does not necessarily mean complete adherence to environmental and agricultural good practices. Recently, it has been observed that the plant biological diversity on organic farm grassland has been decreasing due to reseeding with nitrogen-fixing plants to increase the fertility of the soil (generally, organic farms are in areas with poorer, less fertile soils).

CAP PILLAR II Farm Investments

Arguments in favour - It facilitates modernization and improvements in infrastructure in both conventional and organic farming systems. The instrument holds promise of providing greater tailored support for the modernization of organic dairy operations, including the purchase of tractors, farm machinery and farm infrastructure upgrades such as manure handling/ storage facilities and improvements in livestock housing. This instrument is relevant for small organic dairy farms as it can contribute to improved environmental and economic performance.

Arguments against - It is also applied in conventional farming systems, there should be favoured investment support to producers and handlers of organic agricultural products.

CAP PILLAR II Agro-environmental measures

Arguments in favour - Payments for agro-environmental measures facilitate farmers to think and act in an environmentally friendly way even if by belief and free they would not do so.

Arguments against - Most likely without payments for implementation of agro-environmental measures farmers would not consider continuing implementation of these measures, so it is not truly impacting on farmers' practices. The present measures have limited positive effect in their present application. More research and general information on multiple benefits of implementation of agro-environmental measures are needed.

CAP PILLAR II Advise, information and training

Arguments in favour - It is potentially a key instrument for providing information and training for the transition to organic dairy farming. Advice, information and training on agro-ecological farming practices can meaningfully change attitudes to farming approaches, especially if economic benefits are clearly described. There is potential of future collaboration among key actors to provide a more comprehensive education and training on agro-ecological practices.

Arguments against - It presently mainly strengthens conventional farming systems and to a lesser degree supports organic dairy farming due to a lack of qualified specialists knowledgeable in agro-ecological farming practices.

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CAP PILLAR II Support for Investments in Processing

Arguments in favour - This instrument provides investment support for existing and start-up agricultural product processors including on-farm processing in the form of processing infrastructure and equipment and supporting installations. The instrument is applicable to existing and new activities and priority is given to processing of locally produced products.

Arguments against - Provision of greater and preferential investment support to producers and handlers of organic agricultural products would further stimulate transition to AEFS.

Milk and Fruit for Schools Scheme

Arguments in favour - The scheme promotes healthy diets among children through the provision of free milk, fruit and vegetables in pre-schools and schools from grades 1 to 9. Suppliers are local farmers and producers; the scheme therefore supports short supply chains.

Arguments against - It is ineffective as the procurement of organic is voluntary, so during the last three school years only 4-5% of all milk purchased as part of the school milk scheme was organic. The small amount of organic milk presently produced, and the higher price does not foster the uptake of organic milk in the scheme. The sum allocated for the purchase of milk per child is insufficient to encourage the purchase of organic milk by schools.

How the instruments relate to drivers and barriers

Barriers addressed by the instruments so far - Most of the barriers presented earlier are being attempted by two or more instruments. Only the barrier of lack of advisory services knowledgeable and skilled in organic/ agro-ecological farming practices is being addressed by one single instrument, which is the CAP II PILLAR - Advice, information and training. The low level of mechanisation and outdated infrastructure on organic dairy farms is being partly addressed by the MPI CAP PILLAR II Farm Investments

Drivers addressed by the instruments so far - The two drivers presented earlier are being addressed by the following instruments: CAP II PILLAR - Organic farming, CAP II PILLAR - Farm investments, and CAP I PILLAR - Direct payment and greening. The CAP support for organic farming provides meaningful supplemental income for small and medium organic dairy farms.

Effectiveness of MPIs

CAP PILLAR II Organic Farming Support payments have been the main driver of agro-ecological farming practices to date. Effectiveness could be increased, for example by linking payments not only to area under organic farming practices, but also to offer a premium to those demonstrating sale of produced milk for processing as organic dairy products. Consideration could also be given to providing support for developing new organic dairy products or for the establishment of new

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processing lines. Providing greater preferential investment support not only to organic farmers, but also to producers and handlers of organic products would further stimulate transition to AEFS.
Both the Milk and Fruit for Schools and Green Procurement instruments have stimulated market confidence in organic products through public procurement, however since procurement criteria in these policies pertaining to organic products are optional and organic products are more costly, the share of organic (dairy) products publicly procured has been limited. Mandatory procurement rules could be considered for the public procurement of organic dairy products to stimulate further growth of the organic dairy sector.
The existing instruments are still not effective in making farm advisory services more adequately prepared to provide support and guidance to farmers on agro-ecological farming practices.
The major shortcoming of the existing instruments is the lack of an overriding policy that defines a transition to agro-ecological farming systems as a national priority. An overarching organic strategy with objectives and targets addressing the full value chain would help to catalyse the transition to AEFS.

Lessons learned

On-going public campaigns to highlight the benefits of organic dairy products would help to increase organic product visibility on the retail market. This would help to instil consumer confidence in organic products in relation to competing lower quality local dairy products.

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11. SMALL SCALE DAIRY FARMERS AND CHEESEMAKERS (LITHUANIA)

Data collection method: Workshop Option A
Duration of the workshop: 3 hours
Number and profile of participants: 9 participants from Authorities and administration (3), Farmers and farmers associations (2) and NGOs, civic society organisations, local community representatives (4)

Key dilemma

How to maintain and encourage extensive management (grazing) of grassland habitats? How to become (or remain) competitive in the market without intensifying the farming practice?

General overview of Drivers and Barriers

The key barrier to address the challenge is the lack of knowledge about the most suitable farming practices and their benefits, low entrepreneurship skills as well as insufficient knowledge transfer, i.e. lack of affordable trainings for example for developing entrepreneurship skills. Furthermore, the added value created on farms is low, because farmers rarely process milk on farm, and consumer awareness and interest in sustainable products is low, being more concerned with driven by price and convenience. The prices for resources and services are increasing and extensive farms are the most vulnerable. Moreover, the municipal support for procuring organic, agro-ecological and environmentally friendly products is low. Besides, farmers are in a bad mood and have low hopes about the future and prospects of dairy farming and no long-term vision for their farms. Despite that, the financial support for short supply chain initiatives could efficiently connect farms and consumers and providing possibilities for farmers to realise their production. The products are welcome on local markets, thanks to their exceptional quality. Then the demand for such products helps the extensive environmentally friendly farms to survive.

Analysis of MPIs

Prior to the workshop 17 incentives were recorded, while additional 3 were proposed by the participants of the workshop. 11 of them were marked as “policy” incentives, 6 as “market” and 3 were given a “mixed” category.
According to the questionnaire results about the relevance of these 20 MPIs for addressing the dilemma, none of the MPIs were given any negative impact ratings, except the “National quality agriculture and food products” measure (Figure 10).

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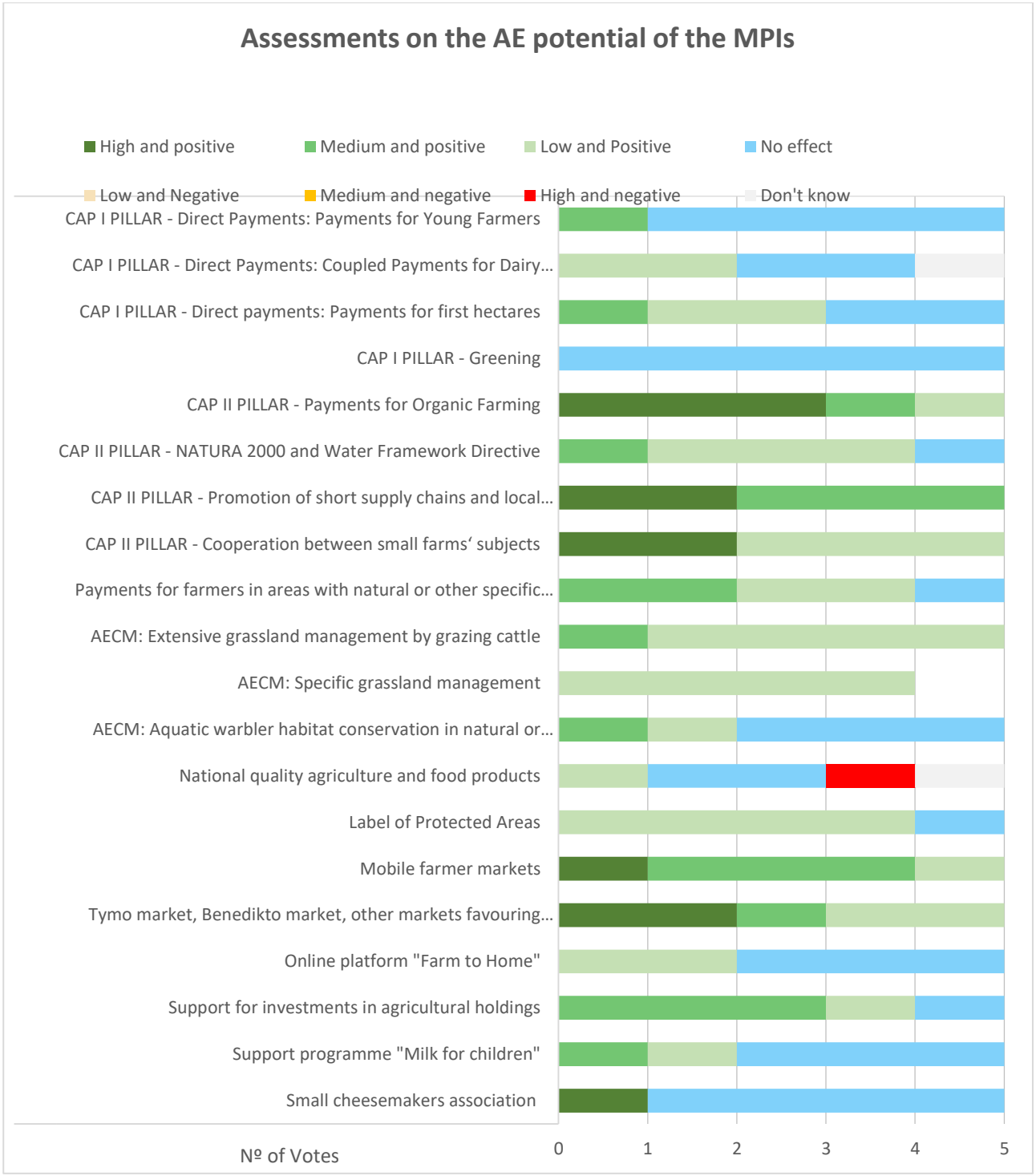
Figure 10. Synthesis of questionnaire findings for the Lithuanian case study.



The final score of these MPIs obtained from the **average score** of all individual votes was maintained in the case of 15 MPIs, but in the other 5 the subsequent debate led to a different **consensual score**. For example, the collective assessment was important to clarify the assessment of the "National quality agriculture and food products", which had received the most different score, and it was finally rated as “no effect”.

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Consequently, the lowest rated or valued MPIs in the LT Case study were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **National quality agriculture and food products** 2. CAP I PILLAR: Direct Payments: Payments for Young 3. Online platform "Farm to Home" 4. CAPI I PILLAR: Direct Payments: Coupled Payments	No effect

Moreover, the best rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **CAP II PILLAR: Organic farming** 2. Mobile farmer markets 3. Tymo market, Benedikto market, other markets favouring organic/ good quality farmers production	High and positive
4. **CAP II PILLAR - Promotion of short supply chains and local markets on local level**	Medium and positive

Later, participants discussed these measures in depth in the barometer dynamic. Here we present the arguments in favour and against for some of the most relevant measures (those underlined in bold above).

National quality agriculture and food products

Participants' opinions - The barometer showed very diverse opinions. One participant had a very negative opinion about it and another one was one of the key persons behind building the concept of this instrument. The latter explained that the idea of the instrument was not bad at all, however it seems it has gone away from the original shape, due to lack of control and monitoring of the instrument and also because it is hard for people to really understand it.

Arguments in favour - The product under the label "national quality agriculture and food products" is more sustainable and environmentally friendly than ordinary products. The "national quality" label stimulates small scale extensive farming.

Arguments against - There is no impact, as there are no dairy farms which would be certified under this "national quality agriculture and food products" label. It had a very strong negative impact by misleading the consumers, who cannot distinguish an organic product from a „national quality"-labelled product.

CAP II PILLAR: Payments for Organic Farming

Participants' opinions - The instrument is directed to promoting the development of organic production. The amount of support matters. Participants rate this instrument as one of the most important.

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Arguments in favour - Organic farming is being recognized as sustainable and non-chemical farming and that is what the consumers value and accept. The payment for organic farming is a very strong support pillar and without it many farms (mostly small farms) would not be able to survive.

CAP II PILLAR: "Promotion of short supply chains and local markets on local level"

Participants' opinions - The instrument is promoting cooperation between the farmers and their joint sales;

Arguments in favour - It promotes cooperation, while making it easier for products of farmers to reach consumers. Helps ease the sales for the farmer and for his products to reach the consumer. Short chains promote direct connection with the consumer, who is often interested in agro-ecology.

Arguments against - It does not work, because it is an artificial mechanism and the provisions of the support scheme are inaccurate.

How the instruments relate to drivers and barriers

Barriers addressed by the instruments so far - a lack of farmers' knowledge on AE farming practices is addressed via various initiatives created by farmers' associations but the movement is not strong and widespread enough to have a significant impact. The increasing prices of resources and services is indirectly addressed by cooperation between small farms measure. Low added value created on farms is hardly addressed but to a small extent is addressed through short supply chains, initiatives created by farmers' associations, investments in agricultural holdings and support for cooperation among small farms. Low consumer awareness and interest in sustainable products is addressed through the quality label, online market "Farm to Home", farmers' markets and through the activities of associations. Low promotion of AE practices in the protected territories is to some extent addressed by label of protected areas instrument. Farmers' fatigue and lack of hope and vision for the future is being addressed to some extent by support for young farmers and cooperation between small farms instruments.

Drivers addressed by instruments so far – the drivers are important, but their effectiveness is limited since some of them are not widespread enough and depend on the motivation of an individual farmer. The short supply chain initiatives, good farmer's marketing and entrepreneurship skills, consumer demand for exceptional quality products and sustainable consumer choices are being addressed to some extent by few market and policy instruments such as labels, farmers' markets, online sales platform and fairs, festivals and other initiatives of farmer associations. Also, by projects and initiatives supporting short supply chains.

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Effectiveness of MPIs

What can be seen from the results in general is that the participants of the workshop have rated most of the instruments as “no impact” or “low positive impact”. That gives a quite clear conclusion that there is a lack of effective instruments related to the case study dilemma which would make a real difference for the situation. During the discussions it was pointed out that direct payments have no impact to AE transition, as they were not designed to encourage sustainable environmentally friendly farming, but rather are instruments for ensuring basic income for all farms. The pillar 2 payments were recognized as giving low positive impact as they are not very well known and popular but bring a positive background within them to farm more sustainably and extensively. The payment for areas with natural or specific handicaps is also not designed to encourage sustainable farming but rather relates to territories with specific environmental conditions, which makes farming more difficult. Natura2000 payment relates to NATURA2000 territories which requires more sustainable and extensive farming ways, so the instrument works rather more as a compensation than a promotion measure. Market instruments such as farmers’ markets got more attention from the stakeholders, since farmer’s markets of all kinds are one of the main places where farmers sell their products. They were the most important to foster agro-ecological transition and therefore should be addressed and improved in the future and even be recognized as of national importance. Moreover, it was discussed that many barriers were addressed only indirectly or to a certain extent, but there was a lack of direct and effective instruments to address the barriers, support the drivers and therefore foster transition to AE.

Lessons learned

Although most of the barriers and drivers of the case study were addressed to some extent, the analysed instruments and initiatives are insufficient for effective transition to AE.
Regarding the instruments, the following general conclusions can be drawn after the workshops:

1. There is a huge lack of representation of small-scale extensive farmers (dairy farmers included) in the development of new policies and instruments in the governance level;
2. Coming from the first conclusion, it can be stated that most of the instruments are designed with no differentiation regarding type of farming and do not specifically encourage development of agro-ecological farming;
3. Nevertheless, there are a few measures which make a positive impact to the transition of dairy farms to agro-ecology, however their impact needs to be strengthened and mobilised.

We have found that the methodology of the workshop worked quite well, given the small number of participants and that we were able to involve them actively into the discussions. However, there was a feeling that the barometer activity was in a way duplicating the rating activity and maybe in the future both could be combined to save time and be more effective.

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11. HOTSPOT OF BIODIVERSITY AND HEALTHY FOOD (TRANSYLVANIA, ROMANIA)

Data collection method: Interviews Option C
Duration of interview: 2 hours
Number and profile of interviewees: 10 interviewees from Science, innovation, advisory, capacity building (1), Authorities and administration (3), NGOs, civic society organisations, local community representatives (4), consumers (1) and agri- food value chain (1)

Key dilemma

How to increase the economic viability of small-scale farming while preserving the cultural landscape and biodiversity?

General overview of Drivers and Barriers

Currently, Romanian agricultural sector is characterised by a strongly polarised farm structure and a severe land fragmentation. The main characteristic of this type of farm is subsistence and its disconnection from business, with very little produced to be sold on the markets. Furthermore, the fact that most farmers own very little land makes it difficult to access certain payments.
Economic viability is a key problem for smallholder farmers. Several obstacles limit it: lack of financial capital for small entrepreneurs, poor infrastructure for processing and storage, lack of invest in rural development and environmental limits (e.g. climate change).
In terms of drivers, time may be one force working in mentality change. With the ageing of older generations, first-hand experiences of communism and its legacies are fading, and younger generations may not carry the same memories. At the same time, new technologies allow for new possibilities to access and disseminate information. In recent years, numerous activities have emerged to strengthen small-scale farmers by engaging in self-organized mutual support associations. Collaborations between local organizations can help to “bridge the gap” between formal rules imposed from the top down, and the needs of local actors aspiring to sustainability.

Analysis of MPIs

The preparatory desk research for the workshop allowed the identification of 30 MPIs related to the key dilemma. In the questionnaires, the participants evaluated the effect or influence of these market and policy instruments on agro-ecological transition. Figure A11 shows the participants’ answers expressed in the questionnaire. Except for two CAP I PILLAR measures, the other MPIs obtained quite positive ratings.

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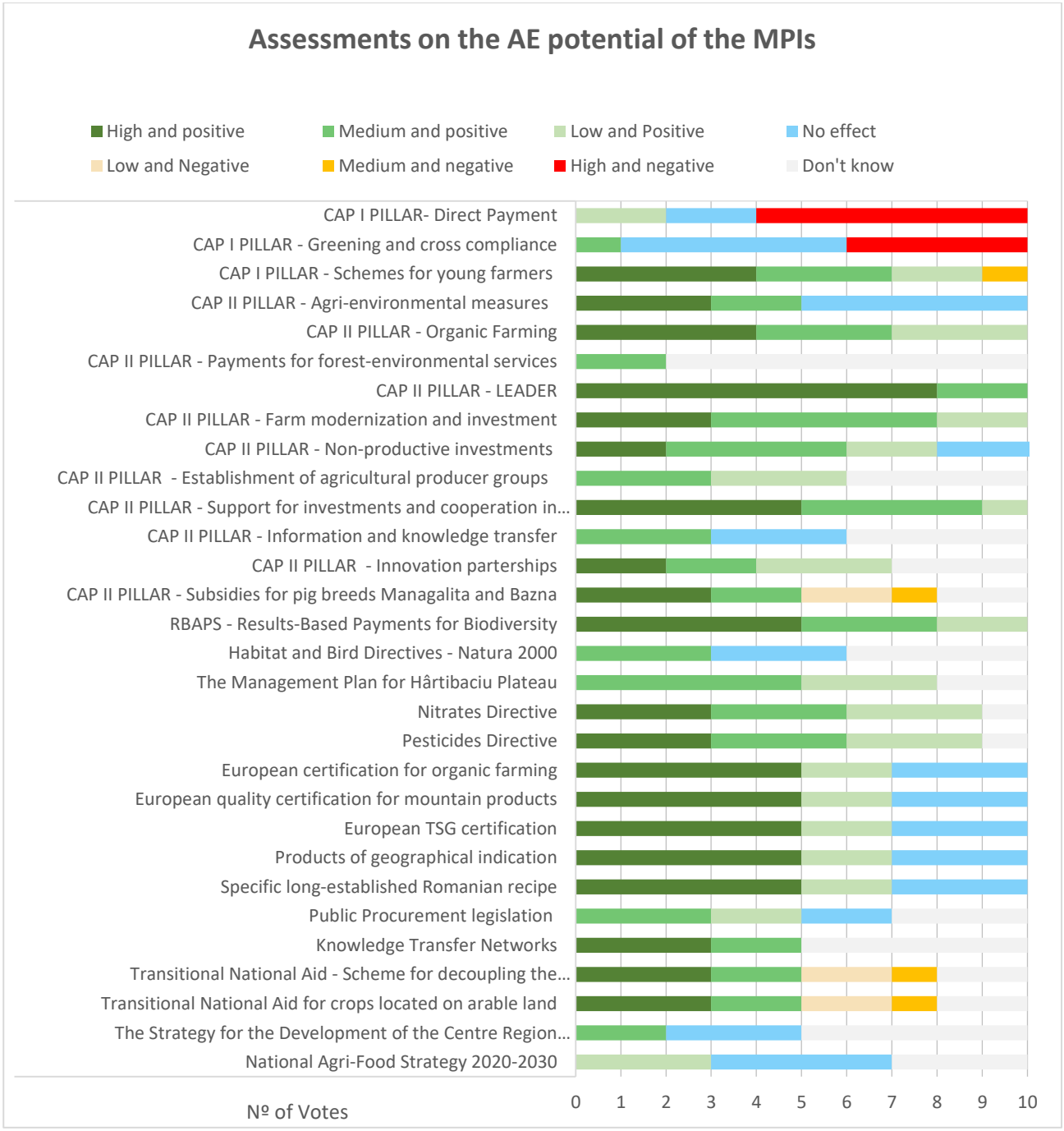
Figure A11. Synthesis of questionnaire findings for the Romanian case study.



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The final scores, obtained from the **average of the individual votes**, show that the lowest rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **CAP I PILLAR- Direct Payment**	Medium and negative
2. CAP I PILLAR - Greening and cross compliance	Low and negative
3. National Agri-Food Strategy 2020-2030	No effect

Moreover, the best rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **CAP II PILLAR – LEADER** 2. Knowledge Transfer Networks	High and positive
3. ***CAP II PILLAR - RDP - Rural Development Program*** 4. **Certification schemes** 5. **RBAPS - Results-Based Payments for Biodiversity**	Medium and positive

The tables above offer the list of instruments supposed to play in favour and against the pursuit of the dilemma that was investigated. Several of these instruments, highlighted in bold, were further analysed during the interviews. Below is shown the participants' opinions with the arguments for and against that arose during the interviews.

CAP I PILLAR – Direct Payment (SAPS - Single Area Payment Scheme)

Participants' opinions – This measure is the one that generates the most discrepancies. Representatives of NGOs, LAG, scientific area and consumers agree on the failures of the measure while APIA representatives consider this tool useful and necessary for the development of agriculture.

Arguments in favour - The allocation of direct support in its current form, single farm area payment, may slow down structural changes in Romanian agriculture allowing small and relatively inactive holdings to survive longer than they otherwise would have done.

Arguments against - The main recipients of direct subsidies are not those in need (small individual farms) which represent the majority, but a small number of very large-scale operators (legal entities).

CAP II PILLAR – LEADER

Participants' opinions - Everyone agreed that the LEADER Program is the most useful instrument on the local level and with the greatest impact on Romanian agriculture. This program

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is based on a territorial approach, a public-private partnership approach (through LAGs[10]) and a bottom-up approach (active participation of the local population in the planning, decision-making and implementation of the strategies necessary for the development of an area).

Arguments in favour - The integrated and multi-sectoral character of strategies is based on the interaction of partners from all sectors of the local economy, who share the problems in the rural area and plan solutions together, a climate which facilitates innovation and experimentation (seeking new answers to existing problems of rural development). It is a useful instrument in the transition, and it can also influence the future scenarios.

Arguments against – No arguments against were mentioned.

CAP II PILLAR - RDP - Rural Development Program[11]

Participants' opinions – Everyone agreed that the investments in RDP are useful tools but difficult in terms of attracting funds by small and medium farmers.

Arguments in favour - RDP provides funding for measures stimulating rural entrepreneurship and generating added-value in the community (e.g. Measure 4 or 6 of the NRDP).

Arguments against – One of the main obstacles for farmers to apply is the lack of business approach and the lack of co-financing (approx. 40% for total amount). In addition, the complex regulations often disadvantage smallholder farmers and peasants, who often lack of time, money and capacity to comply to the rules. Moreover, funding provided for measures only cover part of the expenses incurred with the respective project and the grant is received as reimbursement (e.g. producers are supposed to have their own funds to cover the expenditures first) or as down payment only for beneficiaries able to provide equivalent bank guarantees.

Certification Schemes[12]

Participants' opinions – All certifications applied in Romania are considered relevant but not enough to address the transition.

[10] Local Action Groups (LAGs) are forms of public-private partnerships organized at the local level with the aim to pursue integrated rural development targeting the needs of the territory they are part of (e.g. in Transylvania, LAG Podișul Mediașului, LAG Microregiunea Valea Sâmbetei).

[11] This section includes the following measures analysed: CAP II PILLAR - Farm modernization and investment; CAP II PILLAR - Non-productive investments; CAP II PILLAR - Establishment of agricultural producer groups; CAP II PILLAR - Support for investments in processing/marketing of agricultural products and for horizontal and vertical cooperation of actors along the supply chain.

[12] This section includes the following measures analysed: European certification for organic farming; European quality certification for mountain products; European TSG certification; Products of geographical indication (European GI and PGI labels); Specific long-established Romanian recipe.

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Arguments in favour – The European certification for organic farming is considered very relevant and reliable. The certification allows to value the entire food chain. The rest of the certification schemes are positive promoting: production in restricted areas, traditional products and gastronomic culture.

Arguments against – Despite its benefits, European certification for organic farming can be used in industrial monocultures. The rest of the certification schemes value the origin of the product or gastronomic practices (mountain areas provenance; national origin; historical recipes) but not production practices that are beneficial to the environment. So, they do not necessarily have a direct impact on the transition to sustainable production practices.

RBAPS - Results-Based Payments for Biodiversity (pilot through an NGO initiative)

Participants' opinions – The agri-environment scheme RBAPS is a pilot results-based scheme that may be available over the whole country in the future CAP (post-2020).

Arguments in favour – RBAPS could be a useful tool for transition to agro-ecology, as far as it uses an innovative set of outcome-based ecological criteria for agricultural subsidies (e.g. biodiversity) and has empowered local farmers to take a more proactive stance towards ecologically sustainable farming practices.

Arguments against – The real impact of this pilot program is not yet known, as it has been only tested in 2 areas in Romania (in south-eastern Transylvania).

How the instruments relate to drivers and barriers

Barriers addressed by the instruments so far - RDP Program addressed most of the needs identified like barriers. In other hand, several civil initiatives and NGOs have provided support to peasants applying for EU subsidies or funding, thereby helping to alleviate the economic constraints of traditional farming. For example, to reverse the disappearance of common property, farmers associations have begun to reclaim pastures as common property (Viscri Association). Regarding the environmental problems, advocates of a green economy (NGOs) tend to seek solutions that encourage businesses to act in more environmentally responsible ways. To this end, market-based solutions are often considered particularly suitable. Such solutions may take the form of subsidies and other incentives to encourage desirable activities or, inversely, taxes and other economic disincentives to discourage environmentally destructive activities.

Drivers addressed by the instruments so far – many initiatives already try to foster community empowerment and social networking. Many actors are involved in these initiatives, and these have begun to collaborate on sharing information, skills and resources to directly act or lobby for change. The rich array of existing these initiatives is valuable "seeds". These seeds can be the beginnings of a bold vision for more sustainable agriculture and agro-ecology.

Effectiveness of MPIs

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Agricultural policies by the European Union may not adequately fit local needs. The design of these policies often did not take place with Eastern European conditions in mind.
Despite its declared goal to safeguard biodiversity, much of current EU policy erodes important activities of the primary caretakers of the land – smallholder farmers. Unless such rules are adapted or changed, local people remain constrained in their economic ability to farm sustainably – quite possibly despite having the will and knowledge to do so. In addition, many smallholder farmers remain unaware of schemes that could financially support them in their work, while others are simply overwhelmed by the bureaucratic procedures involved in applying for EU funding.

Lessons learned

Changing mindsets and values often happens from the bottom up. However, changing rules can be more difficult because many rules are imposed from the top down (e.g. from the European Union, or the national government). And yet, such rules are a key part of contextual conditions that constrain in very real terms what is possible in terms of sustainability initiatives.
Essential factors for the establishment of favourable social and institutional contexts include strengthening the connections between initiatives and creating new opportunities for actors in the region to actively shape such contexts. While poorly functioning networks create problems such as wasting time and resources or solidifying power structures, well-functioning networks can have very positive impacts. For example, in the past, professional competition between multiple NGOs in Southern Transylvania contributed to attracting a diversity of funding for several complementary projects and resulted in a relatively balanced distribution of resources. Growing from this, for the past several years there has been an increasingly collaborative environment that allows NGOs to learn from each other. NGOs now often join forces in initiatives, for instance under the joint umbrella of Transylvania Highlands initiative and thus strengthen the policy influence of the NGO sector. In doing so, networks influence the broader social and institutional context of Southern Transylvania and create more favourable conditions for the future success of grassroots initiatives.

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12. AGRO-ECOLOGICAL FARMING SYSTEMS (BASQUE COUNTRY AND NAVARRA, SPAIN)[13]

Data collection method: Workshop Option A
Duration of the workshop: 4.5 hours
Number and profile of participants: 9 participants from Authorities and administration (2), NGOs, civic society organisations (2), Farmers and farmers' associations (4) and Agri- food value chain (1)

Key dilemma

How to reduce the fragility of agro-ecological farms while maintaining the social, economic and environmental sustainability?

General overview of Drivers and Barriers

The agro-ecological transition has been driven mainly by small farmers who have strong convictions in this production model, so they have dedicated time and resources to improve techniques and seek innovative ways to sell their products. In recent years, other drivers have appeared: the emergence of collective initiatives and associations that bring agro-ecological producers into contact, and these with consumers; the increase of awareness and consumption by civil society; and the positive tendency of the Administration of Navarra to favour the AE transition.
However, the transition to agro-ecology in Navarra still faces significant barriers, among which the following two stand out: the agro-ecological sector is not yet sufficiently structured, in particular, there is a lack of infrastructure and development of the value chain, which means a greater workload for farmers who have to deal with multiple tasks (production, experimentation, transformation, bureaucracy and commercialization). In addition, public investment in this model is still insufficient and there are malfunction problems within the Administration that slow down progress (fragmentation in areas; internal synergies resistant to change and government turns).

Analysis of MPIs

The preparatory desk research for the barometer workshop allowed the identification of 38 MPIs. In a questionnaire, the participants evaluated the effect or influence of these MPIs on agro-ecological transition, according to their knowledge and experience. Figure 12 shows the participant's opinions.

[13] Despite the case study focusing initially in the regions of the Basque Country and Navarra, due to the large area covered and in order to maintain the consistency with previous phases of the project (Task 3.1 and Task 3.2), the workshop focused solely on the region of Navarra.

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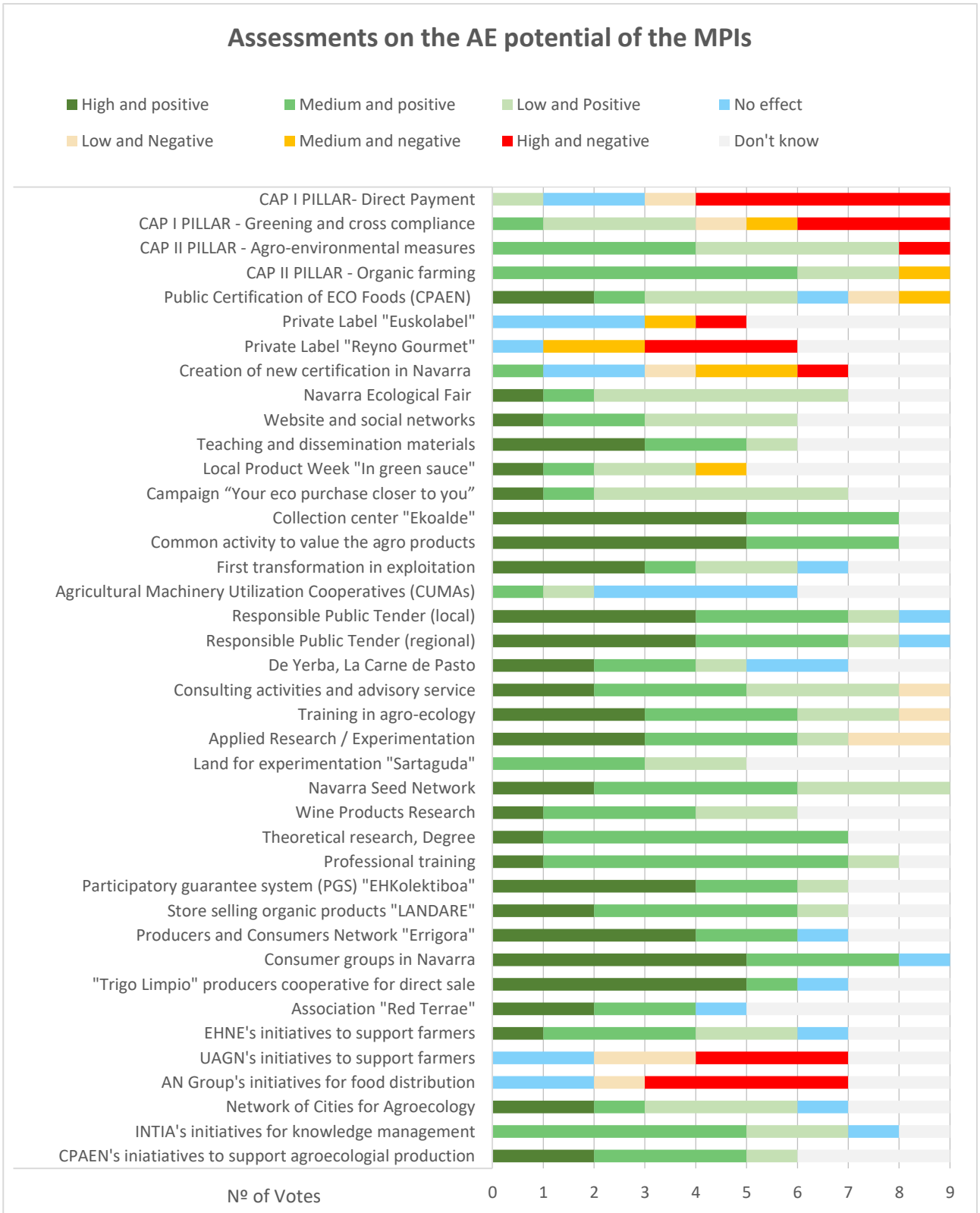
Figure 12. Synthesis of questionnaire findings for the Spanish case study.



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The final scores, obtained from the **average of the individual votes**, show that the lowest rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. Private Label "Reino Gourment" 2. **CAP I PILLAR- Direct Payment** 3. AN Group's initiatives for food distribution 4. UAGN's initiatives to support farmers	Medium and negative

Moreover, the best rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **Collection centre "Ekoalde"** 2. Common activity to value the agro products	High and positive

The tables above offer the list of instruments supposed to play in favour and against the pursuit of the dilemma that was investigated during the workshop. Two of these instruments (the ones highlighted in bold) and two others considered relevant by the stakeholders, were further analysed through the barometer. Below is shown the participants' opinions with the arguments for and against that arose during the debate.

CAP I PILLAR – Direct Payment

Participants' opinions - The worst valued instrument is the economic aid of the first pillar of the CAP because, according to the participants, it is insufficient to support agro-ecological transition and it is inconsistent. Until now, the CAP is mainly assigned to conventional production and is oriented to export markets. Agro-ecology is a minority sector compared to the conventional model. Specifically, the direct payment favours intensive production.

Arguments in favour - The only participant in favour considers that the CAP is positive for the promotion of AE production, as well as for the conventional one. Without it, agriculture and livestock in Europe would be unsustainable. Any financial help is positive.

Arguments against - Most participants consider that the CAP does not facilitate agro-ecological transition because as it is said above, it mostly supports conventional/intensive production. In addition, existing measures in agro-ecology are unconnected and made with little budget and without objectives or horizons to be achieved. They are not effective in promoting agro-ecology. On the contrary, it has been a tool that has favoured social and economic imbalance. Its design must be radically rethought and take a complete turn if there is a real will to reverse climatic, sustainable and healthy situations. In addition, European payments have promoted dependence on aid by limiting the empowerment of the sector. Stop being necessary will be a clear symptom of being useful. Some participants propose that instead of giving financial aid, it would be better to penalize those who do agriculture against the environment.

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Collection Centre "Ekoalde"

Participants' opinions – Ekoalde is a collection centre for local and organic producers, which was set in motion in May 2019. It emerged from the initiative of producers themselves. The government of Navarra responded to this demand and together they made the design. It has been financed with the regional RDP Pilot projects and development of new products, processes and technologies". During the debate, the participants agreed with the positive potential of this measure but pointed out problems of malfunction and doubt its viability to respond to the growing demand.

Arguments in favour - It is considered a strategic initiative that could be a reference for other experiences. The most positive is that Ekoalde proposes an alternative marketing model to the conventional one, which allows the autonomous management of producers (without depending on the large distribution), sustainable distribution and the establishment of a fair price.

Arguments against – They have problems of economic viability because there are not yet many producers who use this collection centre. In addition, it is a model that works for the local and small market, but it is not useful for the distribution of large volumes, so it will not be able to respond in the future to the increasing demand for organic products. On the other hand, the relationship with the government is sometimes distrustful and the facilities are not adequate.

Responsible Public Tender or Procurement

Participants' opinions - The public tender is an initiative of the City Council of Pamplona (the most significant example at the local level) and the government of Navarra (at the regional level) for public purchases of food with criteria of organic farming, proximity, seasonality and freshness, for public canteens (schools, hospitals, etc.). The participants agreed with the positive potential that this measure has in the transition to agro-ecology, despite its problems of implementation.

Arguments in favour – They considered it's a fundamental and necessary project. It can become a pushing tool for agro-ecological transition for two reasons: economic (by volume of purchase) and social (because the visibility and message to society). They also valued the goodwill of this political initiative.

Arguments against - Despite being a good idea, this initiative has problems in its implementation. The administration is not achieving the objective sought. In the end, price is what prevails over other aspects (such as sustainable criteria, local, small sized farms, organic, etc.), then it is the big producers who win the tender because they are the ones who can offer a lower price. It is a problem of management; the administration knows what it wants to promote but does not know how to put it into practice. In addition, there are problems of communication or publicity of the initiative (farmers do not know the measure) and the bureaucratic complexity that it entails for small farmers. These problems may be due to the short time that the project has been carried out.

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Advisory activities, training and experimentation (related to INTIA services) [14]

Participants' opinions – INTIA is a public company under the government of Navarra that for the last four years has been supporting agro-ecological transition through functions such as experimentation, training and advice to producers. The participants agreed with the high positive potential that this measure has in the transition to agro-ecology, despite its many limitations.

Arguments in favour - This initiative is a fundamental tool, which has a very high potential to AE. INTIA is considered a unique model in Spain, the only public service dedicated to advice in farm management. The change made in the last 4 years within INTIA was very positively assessed, with new interesting projects and new committed staff, as well as a willingness to listen to producers.

Arguments against - Its continuity is in danger because it depends on the political will, which is what determines where the institution is oriented. Therefore, government turns can affect the potential of this initiative. Another limitation is the institution's trajectory internal inertia and resistance to change by INTIA technical staff. Technically, the following shortcomings are pointed out: more research, means and personnel are needed; medium/long term and farming system level experimentation is needed; more research based on nature and traditional knowledge; the transmission of knowledge needs to be improved; production techniques should be recycled; it is necessary that the advice is carried out along the value chain, which means a continuous accompaniment to the producer; and finally, more training is needed for technicians because they lack knowledge (sometimes producers know more).

How the instruments relate to drivers and barriers

Barriers addressed by the instruments so far - Most barriers have been addressed by instruments (albeit insufficiently and inefficiently). Within the CAP, there are measures aimed at resolving certain barriers such as improving the economic viability of organic crops, increasing financial investment and promoting generational replacement. On the other hand, local and regional governments have developed promotional measures to increase information; measures to support the value chain (commercialization); and measures of knowledge management (advice, training & experimentation). And finally, collective action has emerged that solve the problems of social and political weakness of the small organic farmers[15].

Drivers addressed by the instruments so far – Only two drivers have been enhanced by instruments: the growing consumer demand that has been promoted by local and regional

[14] This section includes the following measures analysed: *Consulting activities and advisory service, Training in agro-ecology* and *Applied Research/Experimentation,* all of them public initiatives managed by INTIA.

[15] Only five barriers have not been addressed by any political or market instrument. Specifically, no measures have been addressed to: improve limited access to land, rural development, restocking, etc.; reduce economic risk of agro-ecology; change negative beliefs around agro-ecology; make possible the convergence of the conventional and ecological model; improve the functioning of the administration.

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governments and the increase of the agro-ecological social network that has been promoted by civil initiatives.

Effectiveness of MPIs

In the region of Navarra, there have been many innovative initiatives to support the agro-ecological sector in recent years. However, the instruments are still insufficient to solve the main barriers. This is because many of the initiatives are recent and it takes more time and more effort to adjust the programs and develop the value chain. In some cases, more investment is needed, in others the administrative management must be improved and in others a more innovative exercise is required to think about how to solve the problems. It also highlights the instability of public initiatives, since they depend on changes in government.

Lessons learned

There was a very high level of consensus among the participants. The dissent points were contributed by the representative of a large distribution group of mostly conventional products.
A lesson learned is that it is possible to support the transition to agro-ecology when the actors are motivated. In recent years, the political will to support the sector has increased and progress has been shown.
Farmers are very grateful with any initiative that is related to the collective organization of their interests and the formation of social networks: farmer cooperatives, unions, consumer associations, etc.
The great challenges for the sector are in the value chain: to further develop its infrastructure and improve the possibilities of transformation and commercialization. In addition to these problems, future transition strategies should address the following barriers: uncertain economic profitability of some organic crops; the economic and bureaucratic costs of organic certification; the lack of investment in research; the still insufficient technical advice; the discrepancies about what agro-ecology must be; and the problems of generational replacement.

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13. MORE FOOD FROM RUMINANT FARMS (SWEDEN)

Data collection method: Workshop Option A
Duration of the workshop: 3.5 hours
Number and profile of participants: 9 participants from Farmers and farmers 'associations (3), Agri-food value chain (2) and Science, innovation, advisory, capacity building (4)

Key dilemma

What are the challenges and possibilities to diversify specialised ruminant farms (conventional and organic) to include more crops for direct human consumption while simultaneously integrating more agro-ecological principles to enhance sustainability performance in an economically strained production sector?

General overview of Drivers and Barriers

Personal beliefs and ideology as regard the role of a farmer and the organisation of the food system can act as strong drivers for diversification and implementation of agro-ecological practices. There is currently a consumer trend towards more local (Swedish) and organic foods (the latter especially in the public sector) and more plant-based food. Several influential actors within the system, including the grocery retail companies undertake measures to meet this change in consumer demand which, via both purchasing and opinion, drive diversification on farm-level.
The profitability of milk and meat farming has been poor over the past decades. Farmers often have high debt-to-capital ratios (i.e. high borrowing) and describe having limited capacity to make whichever investments would be needed to diversify the production of the farm. The low profitability also contributes to long working hours which in turn hinders adopting possibly more profitable practices such as selling directly to consumers. Currently, the lack of risk sharing across the value chain further hinders testing and adoption of new practices as costs could exceed the expected revenues.
Farmers may lack knowledge and experience of how to cultivate some of the crops for direct human consumption (e.g. suitable varieties, techniques and quality requirements) and also struggle to find advisors to help them, especially in central and northern parts of the country and regarding special crops, i.e. other than wheat, oats, barley and rye. There are moreover strong traditions associated with meat and milk farming, both from the family and the farming community. Those interested in exploring new production practices also often experience negative attitudes from family and/or the surrounding farming community.
There is a lack of facilities for drying, sorting, processing and packaging of legumes and some niche crops (e.g. buckwheat) in Sweden which hinder sales opportunities for such crops which in turn creates a barrier for farmers to start growing them. Moreover, several sections of the upstream value chain are dominated by a few, very large actors that have considerable power over prices

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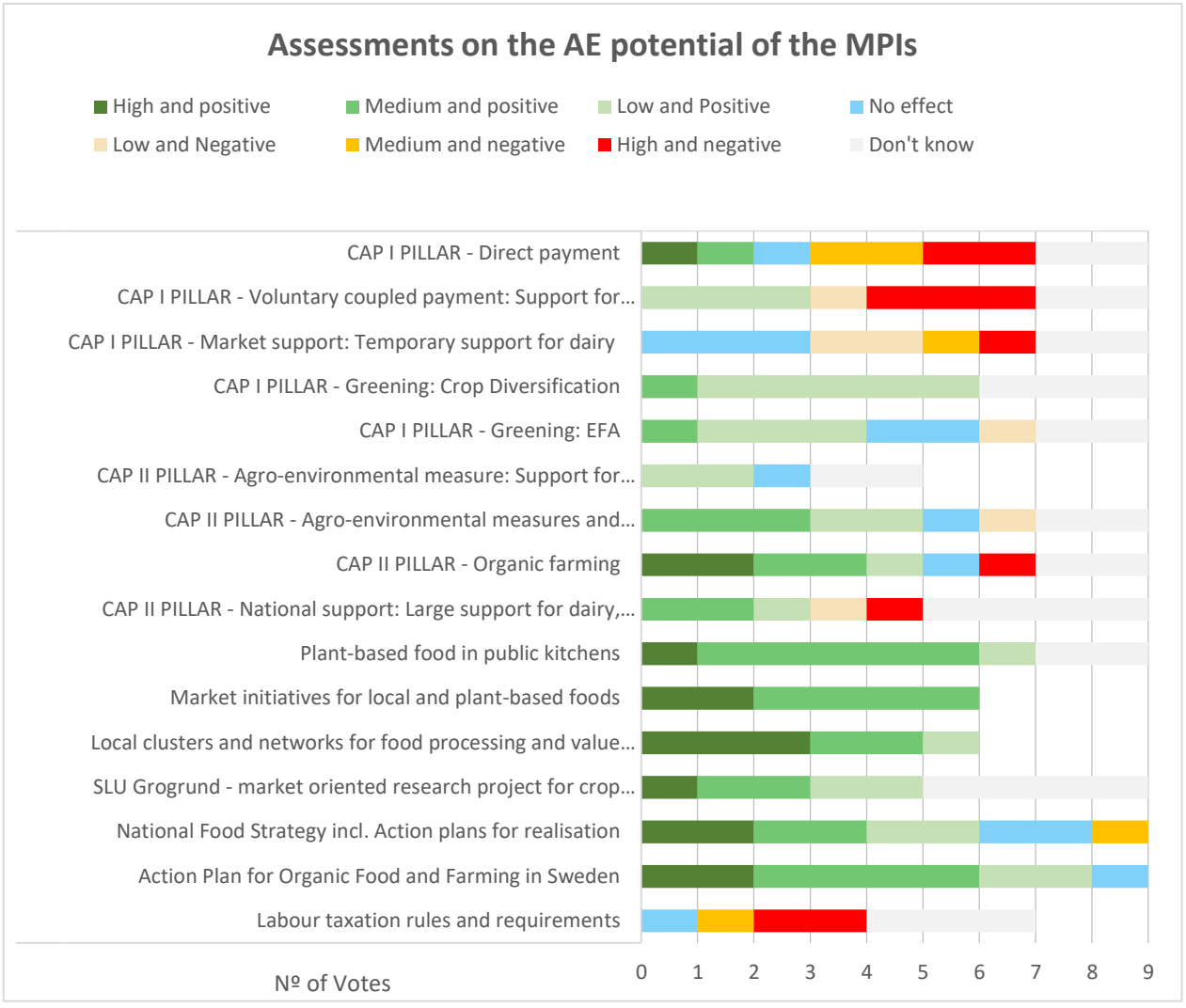
and conditions for farmers which further aggravates the issues of poor profitability and limited possibilities to find sales channels for crops.
A more diverse farm might lead to a higher workload, especially initially, and require broader knowledge including expertise in both livestock farming and cropping for human consumption. The cost of employing labour is currently high in Sweden and it is difficult for farmers to find appropriate staff. The expected return to the large investment of time, money and long-term responsibility for an employee hence creates a barrier for hiring more staff which may be needed to be able to diversify.

Analysis of MPIs

The preparatory desk research for the workshop allowed the identification of 16 MPIs. Questionnaire results about the AE potential link of these MPIs showed the different opinions among participants and their main disagreements around CAP I PILLAR policies (Figure A13).

Figure A13. Synthesis of questionnaire findings for the Swedish case study.



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The final score of these MPIs obtained from the **average score** of all individual votes, show that the lowest rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **Labour taxation rules and requirements**	Medium and negative
2. CAP I PILLAR - Market support: Temporary support for dairy 3. CAP I PILLAR - Voluntary coupled payment: Support for cattle rearing 4. **CAP I PILLAR - Direct payment**	Low and negative

Moreover, the best rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. Market initiatives for local and plant-based foods 2. **Local clusters and networks for food processing and value chain improvements** 3. **Plant-based food in public kitchens**	Medium and positive

Later, during the barometer dynamic, the participants analysed in depth the weaknesses and strengths of 6 MPIS that they considered most relevant (4 of them highlighted in bold above). Here we present the main arguments emerged during the debate.

Labour taxation rules and requirements

Participants' opinions – The rules negatively affect diversification as it hinders farmers from being able to hire employees to help with the heavier workload of a more diversified farm. There is a high risk that if the individual farmer has spent the time, energy and money into training a person, she or he becomes highly attractive on the agricultural labour market and it is thus difficult to keep staff and the investment cost could therefore become unmanageable.

Arguments in favour – None presented during the discussion.

Arguments against - Hiring labour is feasible just for highly business oriented farmers with vast areas of land and several side enterprises (e.g. machine rental and contract work).

CAP Pillar 1 – Direct payments

Participants' opinions – The direct payments favours intensification and increased specialisation and there was a fair consensus on the mainly negative impact of the current payment scheme for diversification.

Arguments in favour – None presented during the discussion.

Arguments against – Direct payments were viewed to "conserve current practices", to solely focus on and support productivity increases and to actively hinder that farmers develop necessary market skills to promote the added values that their production might entail. One

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farmer participant also described that his endeavours to diversify his farm felt like constantly working against the stream because of the current structure of the payment scheme.

CAP Pillar 2 – Organic farming

Participants' opinions – Support for organic farming promotes more intensive livestock production, favours farms with higher livestock densities and, in comparison to the Finish model, do not support on-farm integration of crop and livestock production.

Arguments in favour – The rules around organic farming were interpreted by participants as automatically meaning a more agro-ecological role of ruminants in the farming system (required grazing, larger use of roughage for feed and more extensive practices etc.) and thus supporting on-farm diversification.

Arguments against – This also conserves current production practices and does not support actual diversification to more crops for direct human consumption but instead intensification of livestock production and growing more feed directly on your farm.

National Food Strategy incl. Action plans for realisation

Participants' opinions – The nationally determined goals infer that a range of authorities and regional governance bodies now should deliver plans and policies to implement the strategy which has added to the attention and brought a new level of activity to the Swedish food system. Additionally, this has increased public concerns about the current Swedish agricultural systems and spurred a discussion about the need to increase locally grown food in the Swedish diet, which has helped the inclusion of agricultural diversification targets in the policy agenda.

Arguments in favour - Previously there was very little attention given to food production at all in Sweden and now with the new strategy, this has changed dramatically. Additionally, the nationally determined goals infer that a range of authorities and regional governance bodies now should deliver plans and policies to implement the strategy.

Arguments against - The focus on competitiveness and productivity increase of the policy my increase current (unsustainable) production patterns.

Local clusters and networks for food processing and value chain improvements

Participants opinions – This MPI is important, given the high degree of market concentration, the role of farmers as price-taker and the lack of market know-how.

Arguments in favour – it has helped the vertical and horizontal cooperation within the Swedish food system. It has helped bridging gaps within the value chain and enhancing the governance capacity of local farmers, small scale food processing and innovative product developers

Arguments against – They are not effective enough to increase the profitability of the farm which hinders adoption of new lines of production and practices at farm-level. Being engaged in

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the clusters also requires a lot of time from the farmer, which he or she might not have because of economic constraints.

Plant-based food in public kitchens

Participants' opinions – Those initiatives have originated from local and national sustainability goals, to create a steady and large demand for locally grown food and to promote innovative foods, with greater sustainability attributes.

Arguments in favour – It secures a demand for organic Swedish food and stabilises farmers' income. It has raised the demand for underutilised crops grown in Sweden, e.g. legumes for the meat substitute industry and one can see effects of more farmers opting to grow e.g. faba beans for food.

Arguments against - Low awareness and knowledge among consumers about sustainable agriculture and sustainable food, and especially about plant-based and organic food, and about healthy diets. Public sector's food consumption is a small share of total consumption.

How the instruments relate to drivers and barriers

Barriers addressed by the instruments so far – The National Food Strategy has put more focus on the food system in Sweden and (indirectly) leads to diversification because it challenges views on meat and milk being the only production forms that are viable in Sweden. Additionally, the nationally determined goals infer that a range of authorities and regional governance bodies now have to deliver plans and policies to implement the strategy which has added to the attention and also brought a new level of activity to the Swedish food system which creates more opportunities for improved profitability. Public procurement of plant-based food and local goals for a more plant-based and organic diets in schools indicates the long-term aim/pathway for production which therefore makes it easier for farmers to make the necessary investments and production changes. Local clusters and networks improve vertical and horizontal cooperation and create sales opportunities that circumvent the current market concentration and thus contribute positively to profitability.

Drivers addressed by the instruments so far – The increasing consumer demand for local plant-based foods partially stems from and is supported by public procurement of plant-based food and local goals for a more plant-based. The National Food Strategy has put more focus on the food system in Sweden and (indirectly) leads to diversification by giving support to those who are personally interested in innovating and adopting new practices.

Effectiveness of MPIs

The effects of the MPIs, which contribute positively to overcoming the identified barriers, are slow and gradual and for the most part, MPIs upholding the barriers (e.g. the current CAP payment schemes) have stronger and more immediate effects. Therefore, one may conclude that the

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Swedish case is overall at a very initial stage of agro-ecological transition. The system is dominated by conventional farming practices, embedded in a global food system and largely governed by actors which promote commodification of food and are not concerned with the delivery of public goods from agri-food systems. Many forceful barriers remain and the current market and policy framework acting on this system is mainly conserving current practices and status quo and insufficiently supporting those taking the risk of innovation, integration and agro-ecological diversification. For both drivers and barriers and market and policy instruments, there are a handful of examples of people, initiatives and governmental goals and strategies that support a movement in the direction of system redesign. These are all however small-scale examples of when the mainstream system dynamics could be overcome, but they cannot compete with the strength of forces working against agro-ecological diversification. At least not at present.

Lessons learned

In general, there was high agreement among the stakeholders involved on the importance of different barriers and drivers and market and policy instruments. For the former, all agreed that low profitability in farming is a main obstacle which hinders development, as is lack of knowledge among farmers for growing crops for direct human consumption. For the later all agreed that farming is heavily influenced by support systems in place and that the design of the Pillar 1 payment scheme drives specialisation. Consumer demand for Swedish and organic plant-based food was also identified as crucial. Despite high consensus in general, there were a few aspects for which divergent views were expressed. One concerned the role of the Swedish Food Strategy and whether it fosters an increased focus on productivity increases or instead (indirectly) creates a movement towards diversification. Another area in which different perspectives were expressed was that of market concentration. The Swedish food sector is dominated by a few powerful actors and this was perceived as a main barrier to diversification by many actors due to limited sales opportunities, limited possibilities to charge of added values, few input sellers etc. It was however also expressed that the limited number of actors can sometimes facilitate increased cooperation between the large actors and thus create greater force to drive the system towards improved sustainability.

The group was very motivated to share their perspectives generously. However, the topics covered are complex and few individuals have detailed knowledge of all aspects. Some participants therefore expressed uncertainty in terms of their contributions in some areas. More time could also have helped.

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14. INTENSIVE ANIMAL FARMING (LUCERNE CENTRAL LAKES REGION, SWITZERLAND)

Data collection method: Interviews Option C
Duration of interviews: 1-1.5 hours
Number and profile of interviewees: 5 interviewees from Science, innovation, advisory, capacity building (1), NGOs, civic society organisations, local community representatives (1), Farmers and farmers' associations (1) and Authority and administration (2)

Key dilemma

How to reduce the high animal densities and at the same time remaining profitable against the backdrop of important path dependencies (barn constructions, debts, up and downstream market, knowledge system).

General overview of Drivers and Barriers

Based on the findings in task 3.1 (Socio-Ecological Systems Analysis), we identified several barriers and drivers for the transition to decreasing animal numbers in the Lucerne Central Lakes Region. In order to test the validity of these barriers and drivers, we asked the five interviewees to what extent they agree with the barrier/driver and whether they would add additional barriers and drivers. The following were identified as key barriers and drivers:

- Stable investments: In the past, farmers have invested in large farm buildings to increase animal numbers and productivity. They therefore bear considerable depths and alternative production systems only can be considered if the stables can still be used.
- Lower labour productivity on farms with low animal densities: Lower productivity of agro-ecological farms with lower animal densities is a barrier to the transition towards agro-ecology.
- Traditional knowledge inhibiting conversion to new farming systems: Animal husbandry has historically played an important role in the region. Knowledge is transferred from farms to farms and from generations to generations. This epistemological lock-in is a barrier to change to alternative farming systems.
- Urbanization of case study area: The case study area gets more and more urbanized, which leads to less understanding for environmental problems and for odour nuisances of agriculture among the local population. The local pressure for less animal intensive agriculture rises and is a driver to the diffusion of less intensive livestock husbandry.

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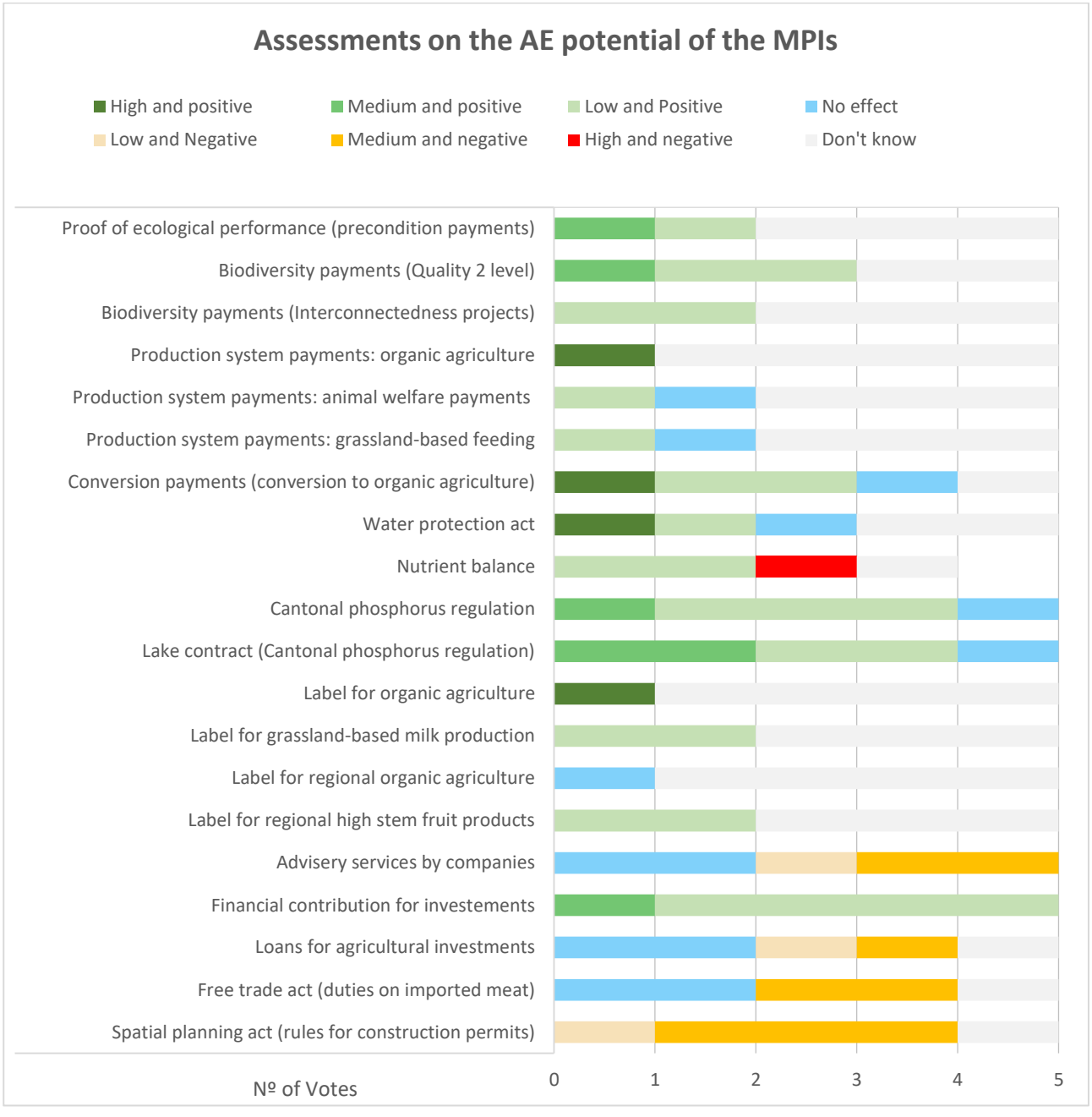
Analysis of MPIs

In the preparatory desk research, we identified 20 market and policy instruments with a potential link to the transition towards decreasing animal numbers in the Lucerne Central Lakes Region. Interviewees made varying assessments with regards to the actual impact of the identified MPIs (Figure A14). In most cases, however, the interviewees tended either to "no effect or positive effect" or to "no effect or negative effect". Only the instrument "Nutrient balance" (the legal restriction of using more fertilizer then is needed by crops) was valued both as having positive and negative impact by different interviewees.

Figure A14. Synthesis of questionnaire results findings for the Swiss case study.



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The final scores, obtained from the **average of the individual votes,** show that the lowest rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. Spatial planning act (rules for construction permits)	Medium and negative
2. Free trade act (duties on imported meat) **3. Advisory services by companies**	Low and negative
4. Nutrient Balance	No effect

Moreover, the best rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. Production system payments: organic agriculture 2. Label for organic agriculture	High and positive[16]
3. Biodiversity payments (Q2), **4. Cantonal phosphorus regulation** **5. Lake contract**	Low and positive

All 20 MPIs were discussed with the interviewees in more detail. Here, we report about 7 MPIs (those highlighted in bold): the 4 instruments considered having most negative influence and 3 of the most positive rated MPIs.

Spatial planning act

Participants' opinions – The spatial planning act is considered as a crucial instrument because it sets the rules for farm developments such as new buildings, reutilization of existing buildings, and the conversion of land. The spatial planning act promotes agricultural activities and is a barrier when it comes to the implementation of non-agricultural activities.

Arguments in favour – The spatial planning act can have a positive impact when it supports a new orientation of farms to alternative production systems.

Arguments against – Traditionally, constructions, which lead to an increase of animal numbers (barn constructions) were admitted by the spatial planning act. The act is considered to rather hinder the transition because it still (partially) supports the increase of animal numbers while at the same time hindering constructions needed for alternative production systems and for farm diversification. Potential negative impacts due to the facts that the act is not very supportive to other value-chain related activities, e.g. processing.

[16] This 2 MPIs obtained the maximum score, however, these result are not very representative given that they only received one opinion and the other interviewees declared that they did not know. For this reason, we have chosen to present in this report the arguments that emerged in the interviews about 3 other positive MPIs, instead of these.

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Free trade act

Participants' opinions – The free trade act is considered having a negative impact on transition because the protection of the national (and regional) meat market leads to higher animal densities in the region. On the other hand, the free trade act allows farmers to import cheap fodder from abroad. Participants' opinions differ when it comes to a prognosis of what would happen if the border protection was loosened. Some say that very specialised and professional farms (such as in Lucerne Central Lakes Region) could maybe continue producing even if border protection was loosened. Moreover, the origin of product (Produced in Switzerland) could be an important buying argument keeping up local production.

Arguments in favour – The free trade act is not considered to have a positive impact on transition towards lower animal numbers. Some interviewees refer to a potential positive impact in the case where the protection of the national meat market would be lost. As mentioned above, this is contested though.

Arguments against – Due to the meat market protection, the domestic production is competitive and there is an incentive to produce large amounts of meat in the country through intensive domestic production with high animal densities. If there was no border protection, then there would be less animals. In the short term, loosening of border protection rules could also lead to an intensification of the systems in order to produce cheaper and stay competitive.

Advisory services by companies

Participants' opinions - Free of charge advisory services by up- and downstream industries are considered an important instrument hindering the transition towards lower animal numbers because advise is provided by companies like fodder traders who have an interest themselves in keeping animal numbers high. They provide advice regarding nutrient balances, barn constructions, etc.

Arguments in favour – Advisory services by companies could only foster the transition towards lower animal numbers if the companies' interest would not be to keep animal numbers at a high level.

Arguments against – Companies are driven by the interest in optimizing profit. Mostly, companies, which benefit of high animal numbers provide free of charge advisory services to farmers.

Nutrient balance

Participants' opinions – Generally, the participants consider this basic rule of the national water protection act as important when it comes to animal numbers because it sets the basic rules regarding nutrient emissions for farms. The instrument was, however, not emphasised because in the case study region, there are additional rules (Cantonal phosphorus regulation) restricting

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emissions even more. The nutrient rules, on the other hand, also allow manure trading. From this point of view, the instrument could even be considered the one having most negative impact even though it was not officially rated as such by the interviewees.

Arguments in favour - Could have an influence if the nutrient thresholds were stricter.

Arguments against - Generally, there is no clear link to animal densities because the reduction of nutrient emissions often goes along with trading of manure and with an intensification of plant production. Instrument does not solve ammonium related issues. Not linked to the regional/local ecological thresholds. Definition of LSU (CH: GVE) is political and not scientific.

Biodiversity payments (Q2)

Participants' opinions – Biodiversity payments are an instrument of the Swiss agricultural policy in order to increase biodiversity on farms. There are different levels farmers may aim for. The quality level 2 biodiversity payments do have a potential influence on the transition towards lower animal densities because they foster extensification. However, the interviewees refer to the dilemma between production and nature conservation.

Arguments in favour - Achievement of biodiversity related goals leading to lower animal densities on the farm. Payments for quality 2 areas were increased, which could trigger more areas being converted. In order to have a real impact, the quality level 2 areas needed to be bigger though.

Arguments against – There is no direct relationship between quality 2 areas and the number of animals. Quality 2 areas could also lead to an intensification of the other areas with an increase of manure transport.

Cantonal phosphorus regulation (including Lake contract)

Participants' opinions – The phosphorus regulation is considered to have an impact because all farms in the case study region should comply with the more rigid rules regarding the nutrient balance. This is supported by the adaptation of the regulation with restrictions becoming more rigorous from 2020 onwards. Moreover, the rules are coupled with additional voluntary instruments (lake contract) where farmers receive payments for reducing phosphorus emissions even more.

Arguments in favour – Emission thresholds lead to lower numbers of animals and to a better health of the lake.

Arguments against – The rules are not strict enough and the thresholds for fertilization should be reduced even more. The instrument may not have an impact on animal number, until there is the possibility to trade and transport manure to other farms.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 773901.

How the instruments relate to drivers and barriers

Barriers addressed by the instruments so far - Stable investments: The problem with the path dependencies due to important investments in barn buildings is addressed by different instruments, including the financial contribution for investments in alternative farm branches, loans for agricultural investments, payments for alternative production systems and labels. These instruments have the potential to help farmers to reutilize the barns for producing other agricultural goods or supporting them in the extensification of the animal production. Other instruments such as the spatial planning act and advisory services provided by companies were however shown to hinder this transition.

Lower labour productivity on farms with low animal densities: Lower labour productivity is addressed by instruments such as payments for extensive production systems and label/certification schemes. Up to now, these instruments have, however, not led to a considerable decrease of animal densities in the case study region. Also, stricter rules about nutrient emissions (phosphorus regulation, water protection act, nutrient balance) can indirectly foster productivity of extensive farm but only if these rules would restrict animal numbers per farm.

Traditional knowledge inhibiting conversion to new farming systems: Education, advisory services and media play a crucial role when it comes to raising awareness to problems related to intensive agriculture and to fostering change towards alternative production systems. The public agricultural school providing basic agricultural education and advisory services to farmers has, however, not plaid a very active role in this regard in the past. On the other hand, intensive production is promoted by companies of the fodder and construction industry by providing advisory services provided to farmers free of charge.

Drivers addressed by the instruments so far - Urbanization of case study area: The only instrument, which has the potential to foster urbanization in the case study area, is the spatial planning act with its rules regarding land conversion and expansion of settlements. However, promoting urbanization potentially bears other negative impacts for the case study area (sealing of soil etc.) so that this should not actively promoted as a solution for the case study dilemma.

Effectiveness of MPIs

There was a general consensus on the impact of the different market and policy instruments on the transition towards lower animal densities in the Lucerne Central Lakes Region: generally, interviewees agree that the problem of most of the instruments regards the fact that even if the instrument could in itself reduce the numbers of animals in the region there still remains the possibility for the farmers to transport manure to other farms (and regions; see instrument „Nutrient Balance") and therefore still keep a high number of animals on the farm.

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Lessons learned

Reducing stocking densities is hindered e.g. by the traditional knowledge of animal husbandry in the region. This knowledge has a long tradition in the area and was stated to be unique in Switzerland. Changing the farming system therefore requires a change in the knowledge system. Such can only happen if incentives, information and adequate education is provided on various levels. Stable investments and the corresponding debts of farmers may limit the options for a transition towards a more agro-ecological production system. Additionally, the profitability of high-density livestock farming is high compared to other agricultural production systems. The high-density livestock farming and the urbanisation let lease prices of land increase which in turn requires the farms to be highly profitable to afford the land. Alternative farming systems would need to offer a similar level of farm income in order to be attractive. The extent of the lock-in manifests itself in the fact that during the last years, literally no farmers applied for up to approx. 45'000 EUR which is offered by the authorities for investments in alternative farm enterprises. This suggests on one hand that there is not much investment into alternative farming practices and on the other hand, that financial capital is probably not the (only) limiting factor to foster innovation.
Among the *external* drivers which have the potential to change the system in the long term, is the progressing urbanization of the case study area. There is an increased sensitivity for environmental problems and a lower tolerance for odour nuisances from agriculture. On the other hand, the urbanisation offers an opportunity for short supply chains, demand of alternative products and direct marketing which so far is not well organized in the area. Nevertheless, urbanization should not be actively promoted by policies since it bears other risks for the region such as the sealing of soil.
Finally, the relatively high daily workload inhibits the strategic planning of farmers. A window of opportunity opens when e.g. the next generation is about to take over the farm or a stable is renovated. So far, target information or advice about alternative and more agro-ecological production systems was not provided to the farmers during such windows of opportunity. This could be a potential starting point for further development strategies for the region. Finally, also agricultural education and further training should be aimed at fostering sustainable agricultural production systems.

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15. MIXED FARMING AND GENERAL CROPPING (NORTH-EAST SCOTLAND, UNITED KINGDOM)

Data collection method: Workshop Option A reduced
Duration of the workshop: 5 hours
Number and profile of participants: 5 participants from Authorities and administration (3), Farmers and farmers associations (1) and NGOs, civic society organisations, local community representatives (1).

Key dilemma

Producing public goods whist maintaining viable production of private goods, and securing economic and social sustainability at a farm level

General overview of Drivers and Barriers

Barriers to transitions to agro-ecological farming systems which were identified are split between biophysical (e.g. consequences of climate change), institutional (e.g. institutions, access to land), infrastructural (e.g. local processing, retail chain standards), and social (e.g. skilled labour, and culture and mindset). The drivers identified can be grouped into the same categories of biophysical (e.g. opportunities of climate change), institutional (e.g. policy and regulations), infrastructural (e.g. technology and innovation), and social (e.g. culture and mindset, and business and system resilience). Some of these barriers and drivers are under the control of policy (e.g. institutional structures or positions of public bodies, access to land, policy and regulations), and some can be influenced by policy and its instruments at a territorial or system level (e.g. availability of local processing, training to develop a skilled labour force). However, institutions that act as barriers may also represent or be within the private sector or civic society. The standards and controls of retail chains or wider value chains are largely in the control of private sector actors, such as investment in, or the uptake of forms of technology and innovation (e.g. renewable energy, precision agriculture, livestock monitoring).

Analysis of MPIs

The preparatory desk research for the barometer workshop identified 35 MPIs. Of those, 30 were categorised as policy, 1 as market and 4 as mixed. Questionnaire results highlighted a range of opinions expressed about the potential of individual instruments to aid a transition to agro-ecological farming systems, as reflected in the pattern of scores shown in Figure A15 The results were quite positive in the set of 35 instruments rated and discussed.

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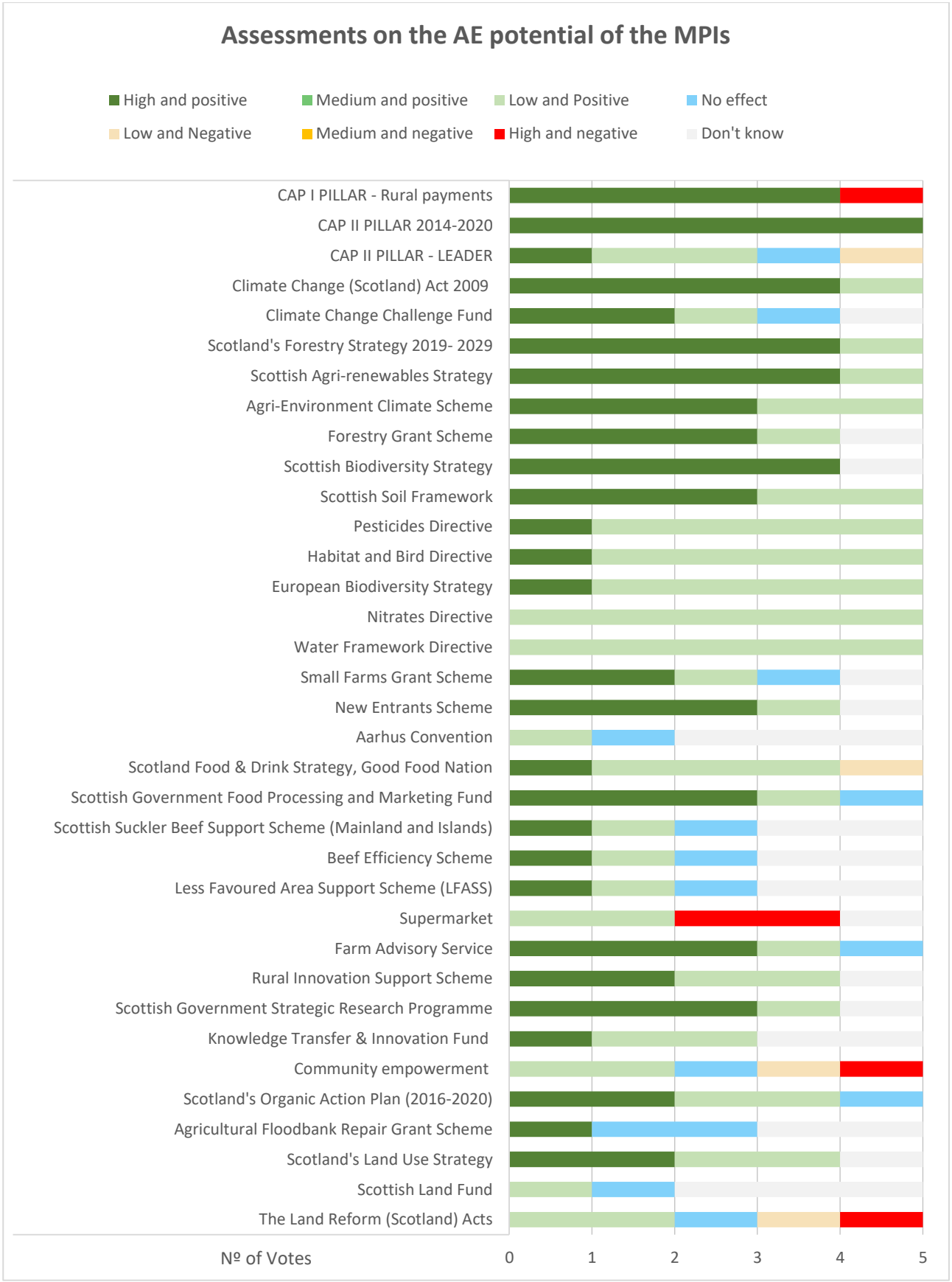
Figure A15. Synthesis of questionnaire findings for the UK case study.



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The final score of these MPIs obtained from the **average score** of all individual votes was maintained in the case of 19 MPIs, but in the other 16 the subsequent debate led to a different **consensual score**. This exercise was of particular importance when there were significant differences between individual scores. For example, the collective assessment of the "supermarket" instrument led to a "no effect" score.

Consequently, the lowest rated or valued MPIs in the UK Case study were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **Supermarket** 2. **The Land Reform (Scotland) Acts** 3. Agricultural Floodbank Repair Grant Scheme	No effect

Moreover, the best rated or valued MPIs were:

MPIs	POTENTIAL LINK TO AEFS TRANSITION
1. **CAP II PILLAR 2014-2020** 2. Climate Change (Scotland) Act 2009 3. Scotland's Forestry Strategy 2019- 2029 4. Forestry Grant Scheme 5. Agri-Environment Climate Scheme 6. **Farm Advisory Service** 7. **CAP I PILLAR - Rural payments**	High and positive

From the discussion, 6 MPIs were selected to be used in the barometer exercise (4 of them highlighted in bold). Below we show the opinion of the participants on their effect.

Supermarkets

Participant's opinions – Responses to mechanisms operated by supermarkets to facilitate the transition to agro-ecological farming systems was mixed. Opinions were split between those identifying mechanisms that can make positive contributions to the transition, and those highlighting the market pressures and priorities which do not lend themselves to the characteristics of products associated with a transition to agro-ecological farming systems.

Arguments in favour – Supermarkets have a high level of influence through setting standards for wholesale and retail channels, and their interactions with consumers. This direct link with consumers provides some sensitivity to changing public preferences which has been reflected in the provision of outlets for produce consistent with agro-ecological characteristics. For example, supermarkets support appropriate standards of animal welfare, organic products, and initiatives to support local vegetables or fruit, and 'wonky veg' (and equivalents at several supermarket chains).

Arguments against - The focus of supermarkets on 'economics and numbers, with not enough of a margin going to producers' limits the effectiveness of the transition to agro-ecological farming systems. The priority of supermarkets was perceived as being on the provision of food at

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low retail costs which has been incompatible with supporting the economic viability of all parts of the supply chain, and undermines the impression of a desire for encouraging environmental improvements (e.g. reflected in insufficient local sourcing of products, and aggressive buying practices).

Land reform

Participant's opinions - Opinions of participants were split regarding the role of land reform policies with respect to transitions to agro-ecological farming practices, with some elements having considerably more relevance than others.

Arguments in favour - Access to land for farming is limited, restricting new entrants to farming. Such new entrants are likely to be younger, possibly recent graduates from agriculture courses, and may have a different outlook to conventional farmers regarding farming practices and agro-ecological farming systems. Public rights of access to land through, for example, the creation of core path networks, should have a positive effect on transitions leading to greater engagement of communities with the countryside and farming practices undertaken locally.

Arguments against - Community buy-outs of upland areas have been largely successful but are unlikely to have significant potential for the transition to agro-ecological farming systems. There are no guarantees of environmental, economic or social benefit accruing from communities buy-outs. Enabling access to land by means of new paths has had some negative impacts of litter, stock disturbance and vandalism, and contested spaces (e.g. dog walkers, cyclists, pony trekking).

CAP Pillar II: Scottish Rural Development Programme 2014-2020

Participant's opinions - This policy, and its associated instruments, is the main driver and means of support for transition to agro-ecological farming systems by farmers, and rated as highly relevant.

Arguments in favour – It has significant levels of funding for schemes directly relevant to the transition to agro-ecological farming systems. In 2019/20 the Scottish budget planned £27 million for grants under the agri-environment climate scheme (AECS), and £52 million for support through the Less favoured Area Support Scheme. Other schemes target specific issues (e.g. LEADER).

Arguments against – Specific requirements of individual schemes can be constraints. The stated aims and objectives are positive for transition, however they can be diluted by process and 'quasi economic and political drivers.'

Farm Advisory Services

Participant's opinions – The Service offers high potential for transitions to agro-ecological farming systems through the quality and range of its activities.

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Arguments in favour - It offers essential advice and mentoring for farmers making the transition to agro-ecological farming systems, and encourages knowledge sharing and the development of new ideas. Good Monitor Farms were considered valuable mechanisms for peer-to-peer learning, enabling farmers to explore realistic solutions in real-life situations and the impacts or contributions to the profitability of the farm.

Arguments against - Advisors are constrained by mechanisms and rules (e.g. Agri-Environment Climate Scheme). Obtaining advice on significant changes to agro-ecological farming systems is difficult. The nature of the scientific evidence regarding impacts of transitions to agro-ecological farming systems is limited due to a lack of examples, comparisons and counterfactual situations.

CAP Pillar I - Rural Payments

Participant's opinions – Direct payments to farmers are supporting the transition to agro-ecological farming systems, possibly as the most significant mechanism. It has significant levels of funding and a requirement that 30% of the Pillar 1 budget goes to greening payments, which support practices which will benefit the climate and environment.

Arguments in favour – CAP Pillar 1 provides basic income support for working farmland, and incentivisation which farmers follow to be eligible for the payments. In the CAP Programme 2014 to 2020, the value of Pillar 1 in Scotland has been c.£3.3 billion. In 2019/20 Greening payments were £131.5 million, which contribute directly to practices consistent with agro-ecological farming. The types of land for which support is eligible include those of the two farming systems of the UK case study. Such support requires the maintenance of land under Good Environmental and Ecological Condition, which is generally consistent with agro-ecological farm practices.

Arguments against – CAP Pillar 1 was considered to be a very blunt instrument which has not done as much as it could to enable the transition to agro-ecological farming systems, which could tend towards maintaining the status quo. There is scope for payments for land used for woodland creation but subject to certain restrictions. Current schemes are too focused on process and should be more directed towards outcomes. The operation of the support mechanism provides no opportunity for dialogue between authorities and individual farmers, and thus no appreciation of the benefits of local knowledge of circumstances prevailing in a given year. The rules are too lengthy and complex, creating difficulties for farmers to understand every nuance of the requirements, and with high penalties for making mistakes. A consequence of such penalties is that many farmers rely on their advisors for assistance which is financially costly and can be frustrating.

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Rural Innovation Support Scheme

Participant's opinions – The scheme has supported projects constituting transitions to agro-ecological farming systems, such as the organic oilseed rape group canola project, and keeping calves together with their mothers.

Arguments in favour - The scope for funding from the scheme offer reasonable scope for transitions to agro-ecological farming systems. It provides professional support to farmers interested in trying new things, such as in relation to grassland management and on-farm biodiversity.

Arguments against – Not all aspects of support are relevant to the topic of transition to agro-ecological farming systems, and financial constraints can be limiting.

Knowledge Transfer & Innovation Fund

Participant's opinions - Participants in the workshop familiar with the scheme considered it to make a low, positive contribution to transitions to agro-ecological farming systems. The scope could increase with the new requirement for 2020 of a focus on "Restoring, preserving and enhancing biodiversity, habitats and ecosystems dependant on agriculture".

Arguments in favour – Participants noted the benefits of aims of the Fund of promoting skills development and knowledge transfer in the primary agricultural sector; and delivering on-the-ground improvements in agricultural competitiveness, resource efficiency, environmental performance and sustainability.

Arguments against - Drawbacks include advisors being constrained by mechanisms and rules, and some difficulties faced by advisors in accessing relevant information.

How the instruments relate to barriers and drivers

Barriers addressed by the instruments so far – Access to knowledge, information, tools and data contribute to tackling several barriers. Notable amongst those are **climate change** (e.g. knowledge of where biophysical impacts will change what can be grown, where and when); **institutions** [17] (e.g. sharing knowledge regarding opportunities offered by agro-ecological

[17] Institutional arrangements and public or private institutions can be barriers to agro-ecological transitions. Examples of the types of institutions are public authorities, membership organisations, or wholesale or retail outlets. One means of tackling such barriers is sharing knowledge amongst institutions on opportunities offered by agro-ecological approaches to farming practices in the area. Effective mechanisms identified for aiding this process include the North-East Scotland Agriculture Advisory Group (NESAAG) which has a membership of public authorities, food processing, membership organisations, and land managers. Its remit is to provide support and advice to the agricultural sector and the wider rural economy of North East Scotland. This mechanism is also identified as an actor in the social network analysis (see Vanni *et al.,* 2019).

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approaches to farming practices); shortage of skilled labour[18] (e.g. training infrastructure for improving land-based skills and capabilities); and culture and mindset (e.g. more effective communication and explanation of agro-ecological farming systems). Several mechanisms and instruments have contributed to the flow of knowledge, in particular the Scottish Government Strategic Research Programme (2016-2021) and the SEFARI Gateway knowledge exchange portal; the set of knowledge and information schemes (Farm Advisory Services, Knowledge Transfer and Innovation Fund, Rural Innovation Support Scheme); and support mechanisms within LEADER.

Drivers addressed by the instruments so far - As with barriers, the provision of knowledge, information tools and data are important contributors to the drivers of transition towards agro-ecological farming systems. The same set of instruments as noted under barriers are of direct relevance in relation to drivers of climate change, technology and innovation, and culture and mindset, such as on-the-ground mechanisms of peer-to-peer learning (e.g. Monitor Farms, demonstration farms and events). Such activities are supported by the Farm Advisory Services of the Scottish Rural Development Programme (2014-2020), the Strategic Research Programme (2016-2021), Knowledge Transfer and Innovation Fund, and Rural Innovation Support Scheme. Direct support for investment in farm infrastructure driven by climate change (e.g. for mitigation) is provided by the Agri-Environment Climate Scheme, Forestry Grant Scheme, and the Climate Change Challenge Fund. which implement policy objectives set out in the Climate Change Act, Soil Framework, the Land Use Strategy, and the Agri-renewables Strategy.

Several of the instruments identified above support drivers of improvements in business and system resilience, in addition to which the Small Farms Grant Scheme contributes, as does the general policy support of the Scotland Food & Drink Strategy. Overall, the policy and regulations, several of which are identified above, are drivers towards transitions to agro-ecological farm systems, the most significant are CAP Pillars 1 and 2.

Effectiveness of MPIs

Climate change is the issue identified as being most influential for the transition to agro-ecological farming systems. The overall response encourages multiple benefits from land so tackling climate change alongside other societal priorities of reversing the loss of biodiversity, ensuring equalities, and sustainable economic growth. These are encapsulated in high level policies such as the Climate Change (Scotland) Act, Land Reform (Scotland) Act, and the Scottish Land Use Strategy.

[18] Addressing the shortage of skilled labour has been through mechanisms aligned to the specific instruments considered, with some linkages. Principally, these are through the training infrastructure for land-based industries, such as Scotland's Rural College (SRUC; www.sruc.ac.uk), and its three main education centres. Amongst resources used in training and education are those funded through the Scottish Government Strategic Research Programme (2016-2021). Routes through which such knowledge is channelled include specialist training providers of LANTRA Scotland and Digital Skills Scotland, with additional support by organisations such as RHASS.

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Of the 35 policy and market instruments associated with transitions to agri-ecological farming systems, 31 were assessed by the UK Multi-Actor Platform as being effective. All the policies and instruments identified of relevance are designed or operate at a national (Scottish) level. The instruments implemented provide several support mechanisms for field level practices which contribute to most of the sub-systems of transitions to agro-ecological farming systems. Significant amongst these instruments are those implemented under Pillars 1 and 2 of EU Common Agricultural Policy, contributing to the transition largely by means of incentivisation, cross-compliance and supporting schemes that have environmental benefits.

The transition is supported by other regulatory frameworks and strategies (e.g. Scottish Forestry Strategy 2019 to 2029 and associated targets for tree planting), and the design of specific instruments (e.g. Agri-Environment Climate Scheme), in which targets for emissions are set which can drive changes in land management practices. It is aided further by the multi-channel approach of policies which are more business focused (e.g. Scottish Food and Drink Strategy, Scotland's Organic Action plan), socially focused (such as land reform), or for delivering a knowledge economy (the Strategic Research Programme). The connectivity designed into many of these policies, and complementarity of instruments, aid the transition to agro-ecological farming systems. The process of engagement with the Multi-Actor Platform has identified gaps and weaknesses in the set of instruments, whilst also recognising the progress being made through the set as a whole.

Lessons learned

The workshop produced an indication of the relative importance of different market policies or instruments in contributing to the transition to agro-ecological farming systems. The discussion indicated a high level of knowledge of almost all the policies and instruments identified. Discussions about the policies and instruments suggests that many of the 35 items which were scored could have positive contributions to make to the transition to agro-ecological farming systems. In-depth perspectives have been obtained from the participants in the workshop on the policies and instruments, and the barriers and drivers. These insights will inform the next steps in the UK case study. No problems were encountered during the workshop. As noted under Section 2 above, the local change made to the materials used was in the wording of the question regarding the effectiveness of individual market policies and measures to remove ambiguity for an English language audience. Feedback from the participants was positive, with most reporting a favourable experience.

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