THE ON-GOING EVALUATION OF NRDP 2014-2020 DURING 2017-2020

Evaluation study VII – Environmental and climate measures of NRDP 2014-2020

ACZ CONSULTING SRL &T33 SRL

EVALUAREA ON-GOING A PNDR 2014-2020 ÎN PERIOADA 2017-2020

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Content

List of acronyms

Acronym	Full name
AFRI	Agency for Financing Rural Investments
AIR	Annual Implementation Report
APIA	Agency for Payments and Intervention in Agriculture
CAP	Common Agricultural Policy
EAFRD	European Agricultural Fund for Rural Development
EAGF	European Agricultural Guarantee Fund
EC	European Commission
EEA	European Environmental Agency
EEION	European Environmental Information and Observation Network
ENRD	European Network for Rural Development
EQ	Evaluation Question
ESIF	European Structural and Investment Funds
EU	European Union
FA	Focus Area
IPCC	Intergovernmental Panel on Climate Change
LEADER	Links between Actions for the Development of Rural Economy
LDS	Local Development Strategy
LSU	Livestock Unit
MA	Managing Authority
MARD	Ministry of Agriculture and Rural Development
MA NRDP	Managing Authority of the National Rural Development Programme
MC	Monitoring Committee
MEWS	Ministry of Environment, Waters and Forests
NFF	National Forest Fund
NGO	Non-governmental Organization
NNRD	National Network for Rural Development
NSSR	National Sustainable Strategy of Romania
NRDP	National Rural Development Programme
PAIA	Paying Agency for Intervention in Agriculture
ROS	Romanian Ornithological Society
RDP	Rural Development Programme
SDG	Sustainable Development Goals
SWOT	Strengths, Weaknesses, Opportunities and Threats
TA	Technical Assistance
TAU	Territorial Administrative Unit
UAA	Utilized Agricultural Area
UM	Unit of Measure
UNFCCC	United Nations Framework Community on Climate Change
WFD	Water Framework Directive
WISE	Water Information System for Europe

Introduction

The purpose of thematic study VII is to evaluate the effectiveness, efficiency and impact generated by the environmental and climate measures within the NRDP 2014-2020. Findings highlighted during the analyzes performed by evaluators were developed starting from the results of the structuring, observation, analysis and evaluation activities of the interventions supported in the current programming period, but they can also be useful for preparing the next financial exercise 2021-2027.

The environmental and climate measures, identified as of the preparation of the Inception Report in 2017 and which constitute the subject of the current evaluation, are the following:

- Investments in the development of forest areas and improving the viability of forests (M8)
- Agri-environment and climate (M10);
- Organic farming (M11);
- Payments for areas facing natural constraints or other specific constraints (M13);
- Forest-environmental services, climate services and forest conservation (M15).

Evaluation study VII is structured in five distinct sections. The first section provides a brief introduction to the evaluation context and the issues addressed, while the second section illustrates the evaluation questions and the logic of the analysis underpinning the findings. In the third section a state of play of programme implementation end-2019 is provided at measure level, while the analysis on the contribution of NRDP to environmental and climate issues is developed in detail in the fourth section, further broken down into specific sub-sections covering each evaluation question. The structure of these sub-sections is similar throughout the evaluation questions and includes: presentation of the methodology, state of play at sub-measure and package level, statistical analysis and literature review, answer to the evaluation question, methodological challenges and conclusions. Last section, the fifth, delivers recommendations for improving the programme, also in the light of the next programming period. The annexes include: presentation of relevant measures, maps or graphical representations of the analyses performed, synthesis of the results obtained from the questionnaires applied to programme beneficiaries, synthesis of the interviews with relevant key actors, results from expert consultations and a summary of main literature references used in the study.

The analyzes related to evaluation study VII were developed based on data that reflects the implementation of NRDP 2014-2020 at the end of 2019.

1. Context of the evaluation study

Agriculture is highly depending on the **quality and diversity of the environmental resources** delivered by the ecosystems. The Millennium Ecosystem Assessment Report (2005) identified the main environmental services delivered by ecosystems to agriculture as well as the impacts on ecosystems from agriculture, such as fragmentation, land use, pollution, and overexploitation. Loss in biodiversity is of growing concern in the public policy debate since the early 1990's. The Rio Convention on Biological Diversity, in 1992, was a first attempt to provide a policy answer at global level to the threats to ecosystems and species caused by human activities. Biodiversity is strictly related with agricultural practices: agriculture and forestry have influenced and shaped the ecosystems over the last centuries. With mechanisation and intensification of agriculture and livestock farming that took place more recently, this equilibrium between agriculture and biodiversity is somewhere disturbed and entire ecosystems (e.g. wetlands) and species (e.g. pollinators) are at risk of decline and collapse. For this, since 1992, biodiversity conservation has become a priority to the Common Agriculture Policy. The 2014-20 CAP supports farmers for the environmental services they provided and asks them to respect a set of basic rules in order to limit their environmental impacts (through the application of the statutory management requirements and the good agricultural and environmental conditions).

In the last 10 years, **climate change (CC)** has emerged as a key challenge for public policy worldwide: all the observed emergencies and environmental threats (floods, drought, heat waves, storms, pressures on natural resources or species extinction and invasive species) are, one way or another, related to the on-going climate change observed at earth-scale. Environmental components are both impacted by climate change and contributing to mitigate its effects. Biodiversity, for example, is affected by climate change, that is a threat for conservation of natural systems, but supports at the same time the adaptation to climate change effects, through the delivery of a large range of ecosystem services such carbon sequestration, cooling function and others.
Yet during the last programming period (2007-2013), Member States have included various climate and environmental operations in their National Rural Development Programs. Some of the most common financed operations covered the fields of soil and water management, renewable energy, energy efficiency, afforestation, natural risk management, irrigation, improving the efficiency of nitrogen use and manure management, as well as permanent grassland management and species protections. The 2014-2020 regulatory framework has extended the possibilities offered to Member States to support climate operations within a wide range of rural development measures, such as agri-environment and climate measures, forestry measures, investments in physical assets, transfer of knowledge and information, and the measure of organic farming.

In the next programming period environment and climate issues will assumed a major weight into the CAP, both in terms of objectives to be achieved and financial allocation.

Focus Areas (FA) selected by the programme to cover biodiversity and climate changes issues are FA4A, FA4B, FA4C, FA5A, FA5D and FA5E. The contributing measures to the FAs and their associated packages are illustrated in the table below.

Table 1: Main and secondary contributions of environment and climate measures, sub-measures and packages to FA

Measures		**Sub-measures**	**Packages**	**Variant**	**Priority / FA (main & secondary)**					
Code	***Name***				***4A***	***4B***	***4C***	***5A***	***5D***	***5E***
M.8	Investments in the development of forested areas and improving the viability of forests	8.1			X	X	X			**X**
M.10	Agri-environment and climate	10.1	P1	1.1	**X**	X			X	
			P2	2.1	**X**				X	
				2.2						
			P3	3.1	**X**	X			X	
				3.2						
			P4			X	**X**		X	X
			P5				X	**X**	X	
			P6		**X**	X			X	
			P7		**X**	X				
			P8		**X**					
			P9	9.1	**X**	X			X	
				9.2	**X**	X			X	
			P10		**X**	X			X	
			P11	11.1	**X**	X			X	
				11.2	**X**	X			X	
M.11	Organic farming	11.1	P1		X	**X**	X			X
			P2							
			P3							
			P4							
			P5							
			P6							
		11.2	P1		X	**X**	X			X
			P2							
			P3							
			P4							
			P5							
			P6							
M.13	Payments for areas facing natural or other specific constraints	13.1			X		**X**			
		13.2			X		**X**			
		13.3			X		**X**			
M.15	Forest-environmental services, climate	15.1	P1		**X**					X
			P2				**X**		X	

Measures		Sub-measures	Packages	Variant	Priority / FA (main & secondary)					
Code	*Name*				*4A*	*4B*	*4C*	*5A*	*5D*	*5E*
	services and forest conservation									

It worth noting than other measures than M10, M11, M13, M8 and M15, such as M1, M2, M4, M6, M7, M16, M17 and M19, address the cross-cutting objectives of environment and climate in the NRDP. However, these are not in the scope of this study, as they contribute indirectly and partially to Priorities 4 and 5.

2. Evaluation questions and logic of the evaluation

According to the aspects provided in the working methodology agreed with the Contracting Authority, Evaluation Study VII – "Environmental and climate measures of NRDP 2014-2020" provides answers to four evaluation questions, the analyzes associated with them being developed according to the following judgement criteria:

1. **To what extent has the NRDP contributed to habitat conservation?**

Evaluation criterion:

- NRDP contribution to enhance habitat conservation.

2. **To what extent has the NRDP contributed to the provision of environmental services?**

Evaluation criteria:

- NRDP contribution to services related to water quality.
- NRDP contribution to services related to soil quality.

3. **To what extent has the NRDP support contributed to mitigation and adaptation to climate change?**

Evaluation criteria:

- Contribution of forestry measures to climate change mitigation and adaptation.
- Contribution of measures applicable on agricultural land to climate change mitigation and adaptation.

4. **To what extent has the NRDP contributed to the sustainable development of rural areas?**

Evaluation criteria:

- NRDP contribution to sustainable development in rural areas.
- NRDP contribution to promote traditional agricultural practices.
- NRDP contribution to reduce the risk of abandonment of agricultural activities.

The contribution to the environmental objectives is analyzed considering the EU normative framework in general and specifically (but not exclusively) the following:

Biodiversity	• The Habitats Directive (Council Directive 92/43/EC) • The Birds Directive (Council Directive 2009/147/EC) • EU Biodiversity Strategy for 2030 (COM/2020/380)
Water and Soil	• The Nitrates Directive (Council Directive 91/676/EC) • EU Water Framework Directive (Directive 2000/60/EC) • EU Soil Thematic strategy (COM(2006)231)
Climate change	• The EU Floods Directive (Directive 2007/60/EC) • EU Adaptation Strategy (COM(2013)216) • European Climate Law (COM/2020/80 final)
Sustainable Development	• A European Union Strategy for Sustainable Development (COM/2001/0264) • Next steps for a sustainable European future European action for sustainability (COM/2016/0739 final)

The logic of evaluation and the correspondence between evaluation questions, measures and focus areas are reported in the following table:

Table 2 : Evaluation logic

Environmental theme	Evaluation question	Measures	Focus Area
Conservation/enhancement of biodiversity and ecosystems	1. To what extent has the NRDP contributed to habitat conservation?	M8, M10, M11, M13, M 15	4A
	2. To what extent has the NRDP contributed to the provision of environmental services?	M8, M10, M11, M13, M15	4B, 4C, 5A
Enhancement of adaptation to climate change	3. To what extent has the NRDP support contributed to mitigation and adaptation to climate change?	M8, M10, M11, M13, M15	5E, 5A
Sustainable development	4. To what extent has the NRDP contributed to the sustainable development of rural areas?	M10, M11, M13	Transversal

3. State of play of environmental and climate measures

The contribution of NRDP to biodiversity conservation emerged from the analysis of the data reported in the monitoring system (administrative data from PAIA). The programme reports a positive trend in what concerns the number of beneficiaries and the surfaces under environmental and climate commitments for almost all the measures and packages. The surface engaged at the end of 2019 correspond to a relevant percent of the UAA[1], with large differences among measures and packages, while around 39% of the total NRDP budget is allocated to measures 10, 11, 13, 15 and 8. M13 is the most popular measure, with around 383 thousands beneficiaries (42% of the UAA), while surfaces under measure 8 are less significant.

The average surface covered by the support provided to the beneficiaries is almost 13 ha for M10 and M13, 46 ha for M11 and over 1000 ha for M15. The number of beneficiaries and the surfaces under commitments in the case of M8 are still low at the end of 2019.

Table 3: Beneficiaries, surfaces and financial allocation per measures, 2019

Measures	Beneficiaries		Surfaces (ha)			Financial allocation 2019 (% of total NRDP)
	2019	Δ/2017	2019	Δ/2017	% SAU	
M10	68,666	+45%	953,890.8	+60%	8%	8%
M11	6,576	+70%	304,477.4	+136%	2%	3%
M13	383,100	-2%	5,272,382.8	+3%	42%	27%
M15	315	+1,868%	335,497	+1,994%	3% of UAA and 5% of NFF	1%
M8	55	-	920	-	/	0.01%

*for measure 15, the values reported correspond to the selected projects, while the values reported for M8 correspond to contracted projects.

The territorial intensity of NRDP support varies at national level, with a higher concentration in the counties of Hunedoara, Tulcea, Constanța, Galați and Maramures. The intensity observed depends on the territorial grouping of measures, sub-measures and packages, as set out in the programming document, as well as on the different degrees of attractiveness, some of them being more popular than others.

Sub-measure 8.1 showed a relatively low degree of attractiveness among potential applicants, landowners, explained on the one hand by specific problems encountered in the application of

[1] UAA (2018) Eurostat: 12,503,000 ha. The aggregation of areas covered by single measures, at programme level, is not processed in this study, given the overlap of some measures and packages.

procedural flows (long period of time required to develop the applicant's guide, procedure manual for the implementation of the sub-measure and the development of the IT system for the management of submitted projects) and on the other hand, due to the low relevance of the measure to the needs of small farmers (there was a reluctance on the part of beneficiaries regarding the conversion of agricultural land to forest land - motivated by lack of rentability).

As in the case of sub-measure 8.1, sub-measure 15.1, although particularly relevant from an ecological point of view, for ensuring quiet areas for forest fauna and responsible exploitation of the national forest fund, proved to be unattractive for forest owners due to the small amount of support granted per ha / year under Package I, which provides for the provision of quiet areas for areas of at least 20% of the total eligible area.

In general, M10 packages are highly attractive, with the exception of package 5, package 9, package 10 and package 11.

The implementation level of M11 is optimal, in relation to the potential (number of registered operators and certified or converted agricultural areas).

Measure 13 is the most popular measure (approximately 283 thousand beneficiaries and a coverage of 42% of UAA) and is based on the most efficient implementation flow among environmental and climate measures, being a measure at which there are not met or reported difficulties.

In Annex 1, maps on the territorial intensity of each measure are presented.

4. Answer to the evaluation questions

EQ1. To what extent has NRDP contributed to habitat conservation?

Evaluation criteria	Contribution of NRDP to habitat conservation
Measures/sub-measures relevant for the EQ	M8, M10, M11, M13, M15
Indicator from monitoring system	• **Common target indicators** R6 / T8: percentage of forests / other forested areas subject to contracts for support to manage biodiversity (focus area 4A) R7 / T9: percentage of agricultural land subject to contracts for support to manage biodiversity and / or landscapes (focus area 4A) • **Common output indicators** O1 - Total public expenditure O4 - Number of holdings / beneficiaries supported O5 - Total area (ha) O6 - Physical area (ha) supported

	O7 - Number of commitments supported
Other relevant indicators	Not the case

Sources of information and methodological approach

The following sources of information have been used in the analysis:

- NRDP monitoring data, related to the surfaces engaged and the number of beneficiaries supported over the implementation period;
- ROS database[2] specifically used to collect information on trends (over the period 2012-2019) of a set of species targeted by the NRDP packages under M10, i.e.: *Lanius minor*, *Falco vespertinus* and *Crex crex*;
- Information extrapolated from the literature review, including Romanian references, related to the impacts of agriculture and foresting on biodiversity and habitat conservation;
- Interviews with the authorities responsible for implementing the environmental and climate measures, PAIA and MA NRDP, with the objective of identifying the specific strengths, obstacles and problems encountered in the implementation, as well as interviews with the Forest Guards, focused on collecting information regarding M8 and M15 (see the list of interviews in annexes);
- Questionnaires with other relevant key actors (eg. representatives of the academic environment, research centers), in order to supplement the information collected through the office research and to provide a more qualitative perspective on the NRDP contribution to habitat conservation (see the list of experts contacted in annexes).

Administrative data, external databases, literature review and survey have been used to illustrate the general and specific contribution of the NRDP to habitat conservation, while the interviews with stakeholders and the inputs collected from experts provided a support for the recommendations formulated in the view of the next programming period. The contribution of NRDP to habitat conservation and biodiversity, in general, can be analyzed from different points of view, but their combination allows to highlight some final findings (see the figures presented in the current section).

Relevant NRDP measures and packages

According to the NRDP strategy, the main contribution to biodiversity is expected to be provided by M10 and M15, while M11 and M13 should contribute indirectly to FA4A. Concerning **sM10.1**, the situation related to sub-packages directly addressing habitat conservation (see table 2) is the following (data regarding implementation status at the end of 2019) [3]:

[2] Romanian Ornithological Society: www.sor.ro

[3] At the end of 2019, the variation of P5 does not register any beneficiaries or areas under commitement.

- *Package 1, Pastures with high natural value (HNV)*, including also data in transition, has increased in 2019 compared to year 2015, both in terms of surface engaged (+33.7%) and number of beneficiaries (+1.55%);
- *Package 2, Traditional agricultural practices*, including also data in transition, surface engaged has decreased with -46.7% and the number of beneficiaries has increased with +0,2%, in 2019, compared to 2015;
- *Package 3 - Pastures important for Birds – variant 1 – Crex crex* , including also data in transition, has increased in 2019 compared to 2015. In particular, the surface engaged has increased by 159.9% and the number of beneficiaries by 347.4%;
- *Package 3 - Pastures important for Birds – variant 2 – Lanius minor and Falco vespertinus*, including also data in transition, has also increased in 2019 compared to 2015, with an increase in the surface engaged of 180.9% and in the number of beneficiaries by 148.8%;
- *Package 6, Pastures important to butterflies (Maculinea sp.), including aslo data in transition,* has reported an increase in 2019 compared to 2015, both in what concerns the surface engaged (+ 137.4%) and the number of beneficiaries (+ 108.4%);
- *Package 7, Arable lands important as feeding points for Red-breasted Goose (Branta ruficollis)*, including also data in transition has increased the surface engaged by 52.9% and the number of beneficiaries by 57.6% in 2019, compared to 2015;
- *Package 8, raising local farm animals in danger of abandonment;*
- *Package 9, Permanent meadows important as feeding areas for the lesser spotted eagles (Aquila pomarina)*, has been added in the ninth version of NRDP[4] and it has reported an increase in 2019, compared to 2018, of +8.1% in terms of surface engaged, while for the number of beneficiaries there was an increase of +44.8%;
- *Package 10, Ecological refuges on arable land for common bird species associated with agricultural land*, has been also added in the ninth version of NRDP, and it has increased the surface engaged by 131.4%, while the number of beneficiaries decreased by –33.3%, in 2019, compared to 2018;
- Similarly, *Package 11, Agricultural lands important for bustard (Otis tarda)*, added in the ninth version of NRDP, has slightly increased in 2019, compared to 2018, for the surface engaged (+0.4%), while the number of beneficiaries remained unchanged.

[4] National Rural Development Programme 2014 – 2020, Version 9.0

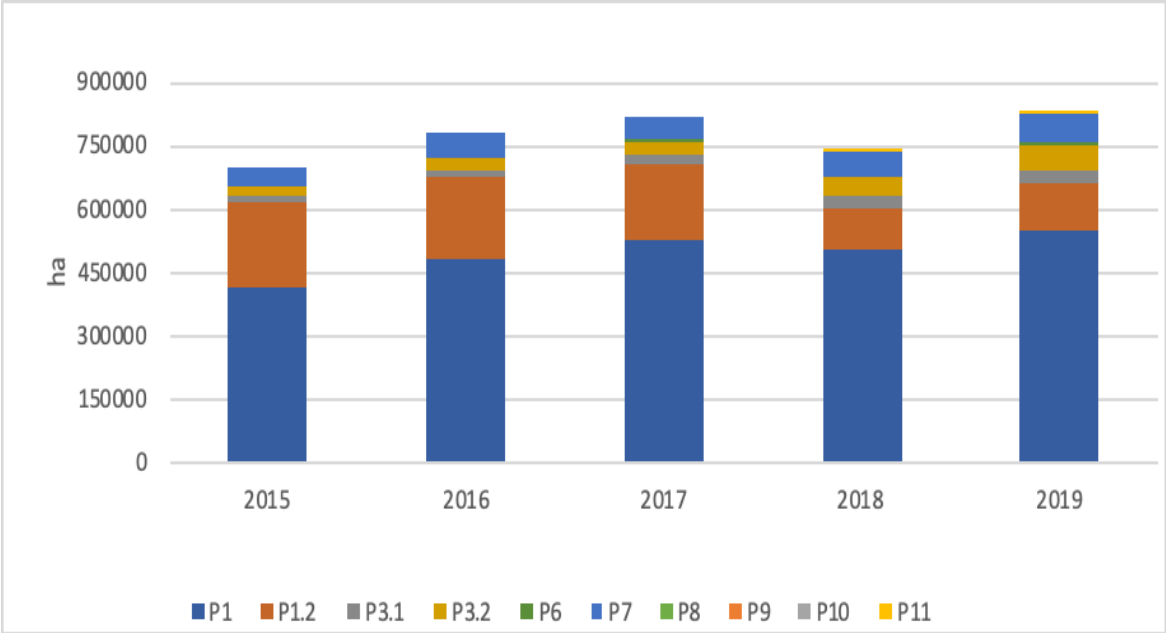

Figure 1: Surface of supported areas under measure M10, for each single package, during 2015-2019[5] (MU: ha and number, Source: data provided by PAIA, for years 2015-2019)

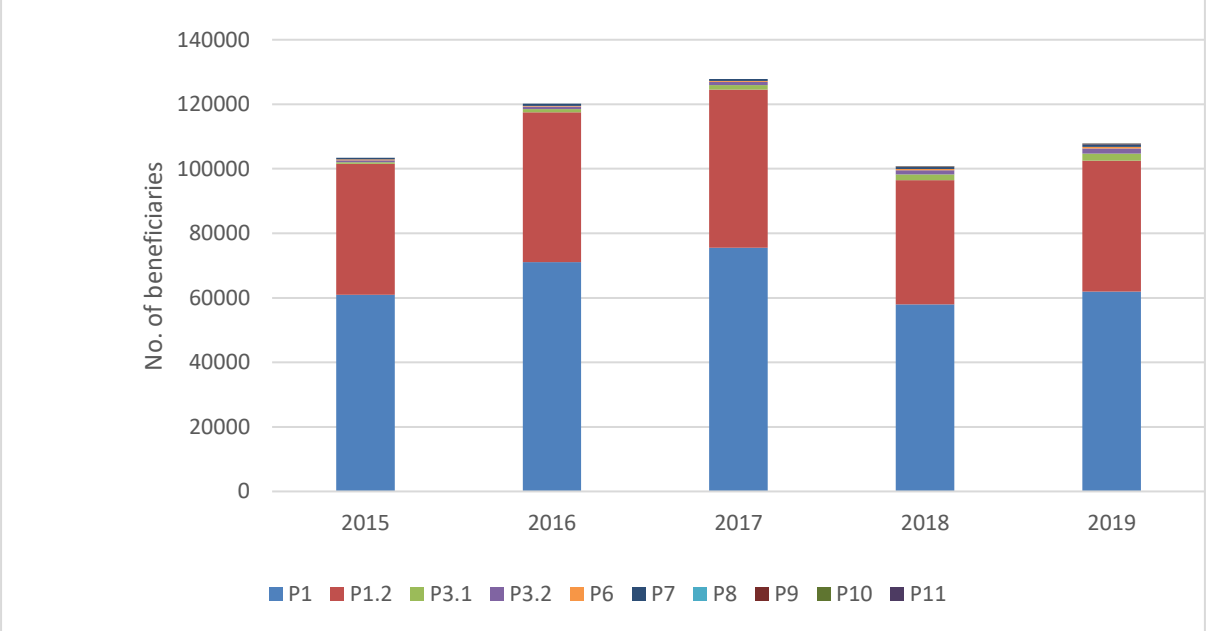

Figure 2: Number of beneficiaries receiving support under measure M10, for each single package, during 2015-2019[6] (MU: ha and number, Source: data provided by PAIA, for years 2015-2019)

[5] It is important to mention that the negative trend observed between 2017 and 2019, from figure no. 1, is explained by the conclusion of the M214 commitments in 2017

[6] *Ibidem 5*

M11 contributes to biodiversity and habitat preservation, although indirectly (see table no. 1 - Main and secondary contributions of agri-environment and climate measures, sub-measures and packages to FA). The main contribution is driving by the commitments under water management (and soil, secondarily), banning the use of fertilizer and pesticides and promoting the grow-up of different crops, contributing to the development of rotation plans. The support provided under sub-measure 11.1 – Support for the conversion to organic farming practices and methods, covered a surface of 155,114.94 ha, with a number of 3,644 beneficiaries, corresponding to an increase by +736.9% in 2019, compared to 2015. The support provided under sM 11.2 – Support for the maintenance of organic farming practices and methods, covered a surface of 149,362.45 ha, with 3,788 beneficiaries, and has increased by +818.7% in 2019, compared to 2015. M11 support can by cumulated with packages under measure 10, although in a limited extend and related to packages not targeting biodiversity conservation.

The graphic below shows the surfaces and beneficiaries supported by M11 P6.2, for which a support from M10 (P1, P2, P3, P6, P9.2) has also been granted. In 2019, the area employed under M11 P6.2, benefiting also from support through M10, was 51,455.53 ha, with a number of 1,093 beneficiaries.

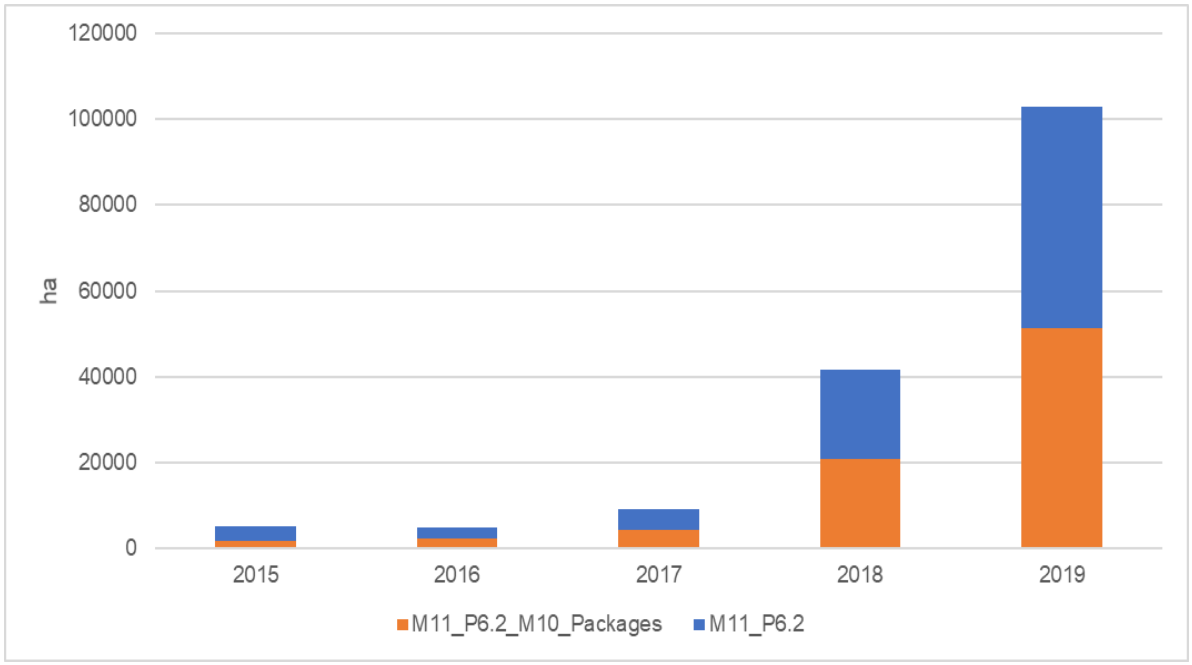

Figure 3: Surface of the cumulative support offered by M11_P6.2 and M10 packages (P1, P2, P3, P6, P9.2), from 2015 to 2019 (MU: ha, number; Source: data provided by PAIA for 2015-2019)

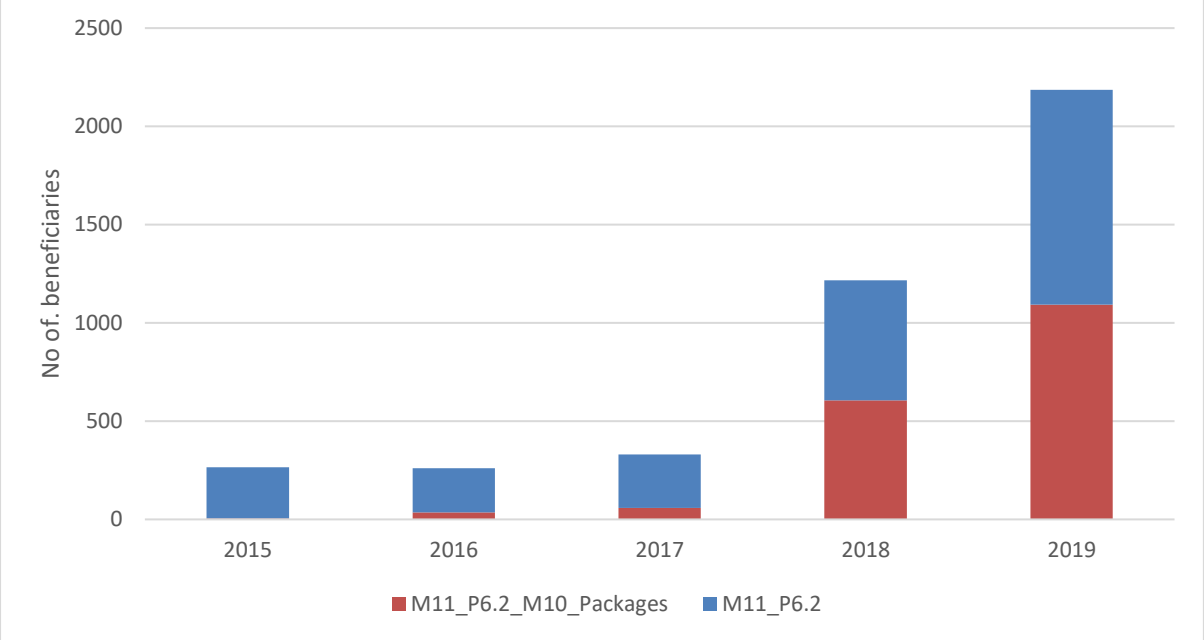

Figure 4: Number of beneficiaries of the cumulative support offered by M11_P6.2 and M10 packages (P1, P2, P3, P6, P9.2), from 2015 to 2019 (MU: ha, number; Source: data provided by PAIA for 2015-2019)

M13 provides an indirect contribution to biodiversity conservation objectives (FA4A)[7]. It worth referring that the measure supports, as first objective, areas with a low farming potential (such as the Danube delta or mountain areas), compensating for a loss of revenue, or where agriculture requires additional efforts and so higher costs to reach the same level of productivity as in the other part of the country. However, this measure overlaps to a significant extent with areas with high biodiversity potential, both in terms of habitats and species.

In the literature available at EU level, M13 is not considering as contributing directly to the objective of conservation and restoration of biodiversity, as mentioned for example in the recent study ”Evaluation of the impact of the CAP on habitats, landscapes, biodiversity”[8]: “*M13 Schemes generally do not include any specific land management requirements that benefit biodiversity conservation (beyond adherence to cross-compliance). M13 may improve the economic viability of HNV pastoral*

[7] This indirect contribution is supported by various studies published at EU level. For example, the study "INTEGRATION OF NATURA 2000 AND BIODIVERSITY INTO EU FUNDING" (https://ec.europa.eu/environment/nature/natura2000/financing/docs/Natura2000_integration_into_EU%20funds.pdf) reports that M13 and M11 "has no formal commitment to nature conservation other than cross-compliance standards ”. Similarly, the study “EVALUATION OF THE IMPACT OF THE CAP ON HABITATS, LANDSCAPES, BIODIVERSITY” (Alliance Environment, November 2019, DG Agri publication) states that “M13 schemes do not generally include specific land management requirements that benefit from biodiversity conservation (beyond respecting cross-compliance).

[8] Final report, Alliance Environment, November 2019 (DG Agri publication). A similar finding is highlighted in “INTEGRATION OF NATURA 2000 AND BIODIVERSITY INTO EU FUNDING”: ‘*M13 and M11 “do not have any formal commitment to nature conservation beyond standard cross-compliance*”; table 3, available at https://ec.europa.eu/environment/nature/natura2000/financing/docs/Natura2000_integration_into_EU%20funds.pdf

systems and/or EU protected habitats and thereby indirectly contribute to preventing abandonment of these systems and consequential loss of habitats and species".

However, it should be also noted that in Romania the measure overlaps also in a significant extend with areas having a high biodiversity potential, both in terms of habitat and species. Considering the natural constrains which imply the use of less intensive farming techniques (e.g. minimum tillage) or require an extensive use of land (traditional orchards or pastures), areas under M13 are expected to provide also benefits in terms of biodiversity conservation. In addition, in the current programme, the support can be cumulated with other packages in measure 10, which both guarantee the major use of less impacting farming approaches through the respect of specific commitments and, at the same time, reinforce the attractiveness and coverage of biodiversity conservation interventions in areas with natural handicaps. In 2019, the beneficiaries of the cumulative support provided by sM13.1 and M10 correspond to around 24% of total sM13.1 beneficiaries; the area employed by the beneficiaries supported by sM13.2 and M10 represents about 2% of sM13.2 area, while beneficiaries of sM13.3, who also received support through M10, represent about 13% of sM13.3 beneficiaries.

Considering the analysis at packages level, beneficiaries of package 1 correspond to 10.7% of sM13.1 beneficiaries , while for sM13.2, the most represented is package 7 and under sM13.3 package 3 of M10.

For what concerns the projects in transition, for beneficiaries beneficiating from both M13 and M10 measures the situation is the following: sM13.1, in 2015 88% are in transition, 59% in 2016 and 47% in 2017; for sM13.2, in 2015 all are in transition, 74% in 2016 and 49% in 2017; while for sM13.3 the percentage are 33% projects in transition in 2015 and 2016 and 15% in 2017.

The graphics below shows the number of farmers supported by sM13.1, sM13.2 and sM13.3 which also benefited from compensatory payments through M10. It is noticed an increase of he supported granted in the case of all sub-measures, over the analyzed period.

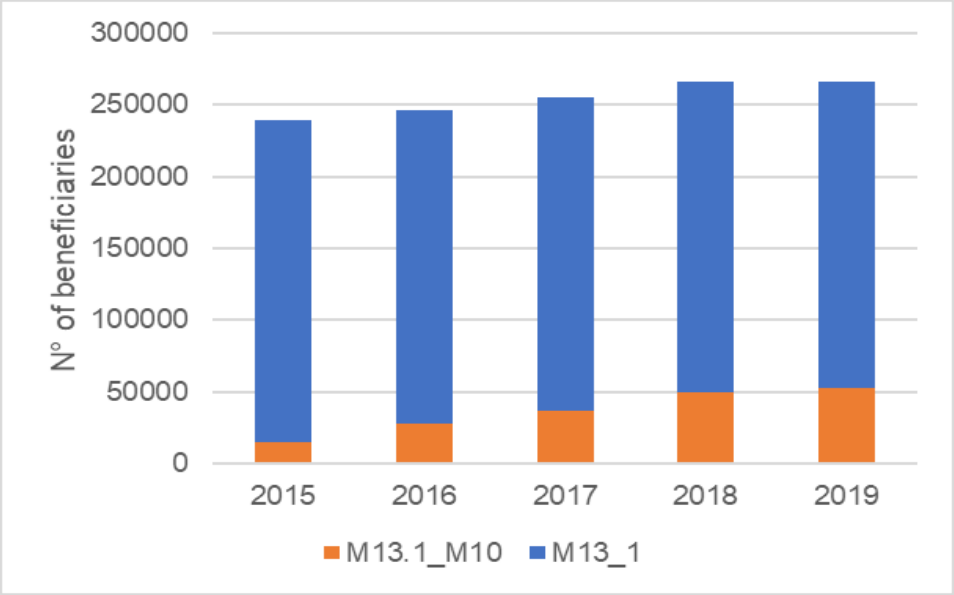

Figure 5: Number of beneficiaries of sM13.1 overlapping with M10, from 2015 to 2019 (U.M.: number, source: data provided by PAIA, for the years 2015-2019)

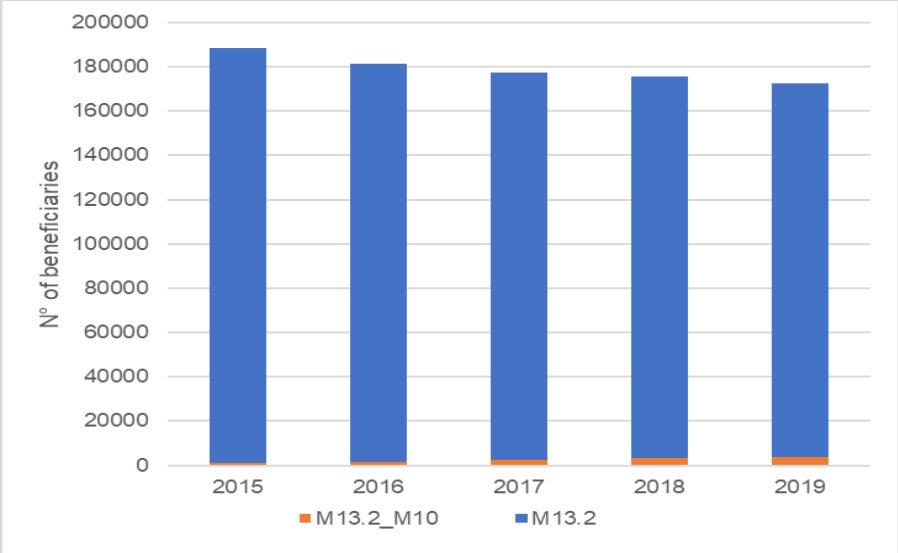

Figure 6: Number of beneficiaries of sM13.2 overlapping with M10, from 2015 to 2019 (U.M.: number, source: data provided by PAIA, for the years 2015-2019)

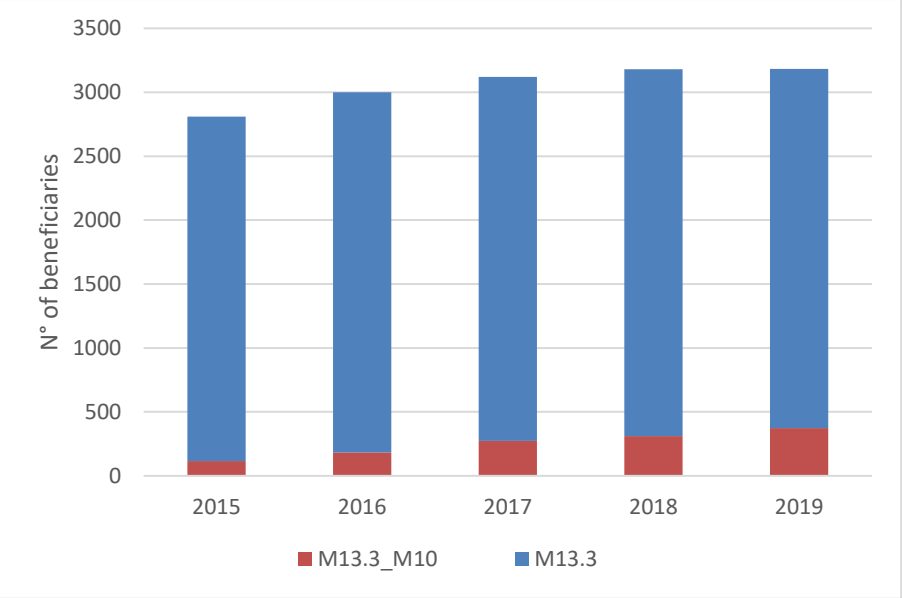

Figure 7: Number of beneficiaries of sM13.3 overlapping with M10, from 2015 to 2019 (U.M.: number, source: data provided by PAIA, for the years 2015-2019)

Concerning forest habitat, within NRDP were identified two sub-measures supporting the sustainable forestry: **sM15.1**, - payments for forestry environment commitments, and **sM8.1** - afforestation and creation of woodland. Both sub-measures have reported delays in the implementation and have been launched only in 2017. In 2019, the support provided under sM15.1 – which provides a direct contribution to biodiversity in forest habitats - covered a surface of 334.282,38 ha, with 312

beneficiaries (Package 1)[9]; the sub-measure shows a sharp increase in the number of beneficiaries as in 2018 the support covered only 16,017.09 ha, with 16 beneficiaries. SM8.1, contributing indirectly to habitat conservation and biodiversity, delivered a support to 55 beneficiaries, corresponding to a small surface of around 920 hectares, while in 2018 the employed area was equivalent to 333.89 ha, the number of beneficiaries being 24.

Conservation measures in Natura 2000 sites

The data in the table below shows that a large part of the surfaces covered by the contribution of M10 (82,5%), M11 (75,3%) and M13 (77,2%) are clustered in Natura 2000 sites or its surrounding, the M15 surfaces having a lower weight (approximately 90%); while M15 in Natura 2000 sites corresponds to around 4% of the forested areas. However, it is worth noting that only a small part (in terms of surface involved) of Natura 2000 sites are covered by the interventions under M11, M13 and M10, the weight being higher in the case of M13 (see maps in Annex 1).

Table 4. M10 and M11 support related to Natura 2000 network. Source: NRDP database[10]

NRDP support considered	Share of surface supported by measures in Natura 2000 network (1)	Share of Natura 2000 network covered by the support (2)
M10 (total)	82.55%	4.93%
M10_P1	82.59%	2,75%
M11	75.34%	1.28%
M13	77,25%	22,76%
M15	92,11%	1,57%

(1) % ECM in Natura 2000 sites (or surroundings) and (2) % of Natura 2000 area covered by the support. Source: NRDP database, Natura 2000, European Environment Agency Network (link: https://www.eea.europa.eu/data-and-maps/data/natura-11)

Statistical analysis and literature review

The link between NRDP contribution and habitat conservation can be read also through a more accurate analysis of the change in biodiversity indicators in rural areas covered by the NRDP measures over the period. Some bird populations associated with agricultural land, in certain areas of the country, have the ability to positively influence the state of biodiversity.

[9] According to the selection report for session no. 2/2019, published by APIA, the committed area, within package 1, was 293,144.72 ha. Source: http://www.apia.org.ro/files/pages_files/Raport_selectie_final.pdf.

[10] The data related to Natura 2000 sites used in the study is collected from the EEA website which do not allow for a distinction between agriculture areas and other typology of land use. However, the distinction is not relevant for the purpose of our study considering that the main objective is identifying areas under commitments in relation with areas under Natura 2000 management plan, whatever the type of land use.

Farmlands are the most extensive habitat for biodiversity in Europe, harboring more than one half (250 species) of the European bird species, of which 50% are either threatened or have suffered steep population declines (Emmerson et al., 2016).

Hence, in order to show the status of habitat over a recent period of time, the trend considered three farmland bird species directly addressed by the NRDP measures, and in particular by M10 (package 3, variant 1 and variant 2, package 7 and package 11): *Crex crex, Lanius minor* and *Falco vespertinu*s, *Otis Tarda* și *Branta Ruficollis*, as reported in the graphic below. Data are analyzed in terms of ratio between individuals observed and numbers of observation, to avoid dependencies between the detected trend and the number of observations.

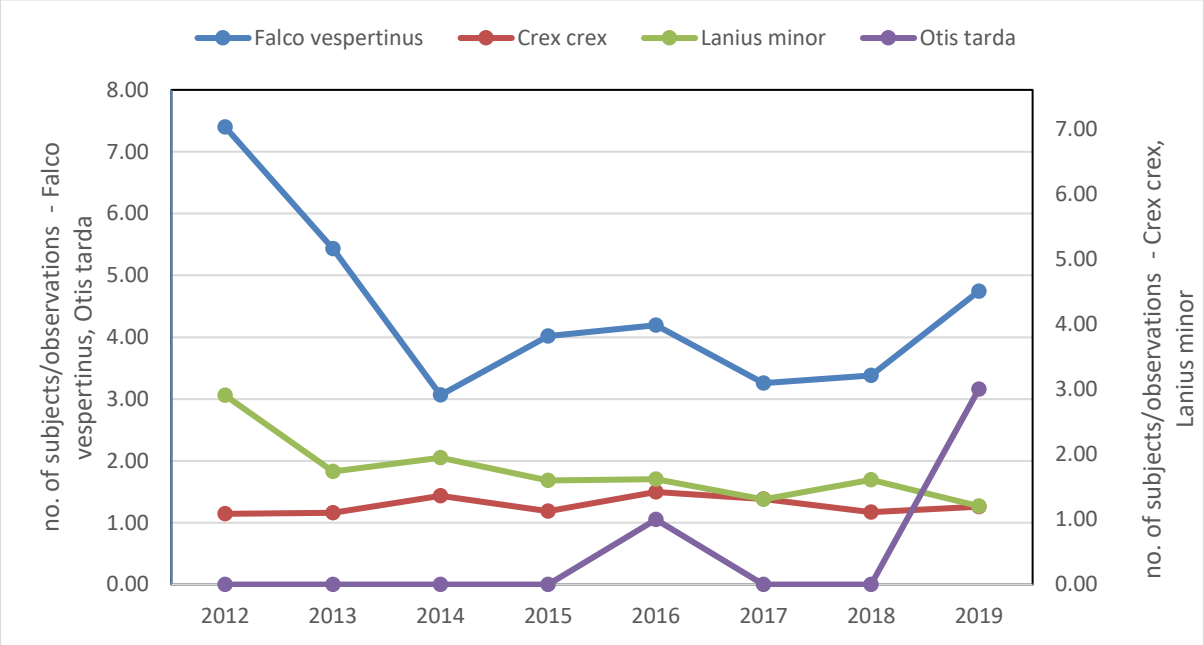

Figure 8: Trend of the species Crex crex, Lanius minor, Falco vespertinus and Otis tarda, calculated as the ratio between the number of individuals observed and the number of observations per year (2012-2019) (U.M.: individuals observed divided by the number of observations; Source: ROS platform. Link: http://pasaridinromania.sor.ro/ornitodata)

The latest data reported by EU and national platforms on European common bird trends highlight a continued decrease of European farmland birds , showing a staggering decline of -57% from 1980 to 2016. Concerning some example at species level[11], the Red-footed Falcon (Falco vespertinus), with an estimated population of 30,000-64,000 pairs in Europe, is suspected to be in decline owing to ongoing habitat destruction. Concerning the species Corncrake (Crex crex) the overall European population trend is considered stable, even if land-use changes are precautionarily predicted to drive a future decline of 1-19% in the forthcoming three generation (11 year) period. The European population of this species is estimated at 1,290,000-2,120,000 calling or lekking males, which equates to 2,590,000-4,240,000 mature individuals, while in Romania, the estimated population is 44,000-60,000 pairs. The

[11] Pan-European Common Bird Monitoring Scheme (PECBMS) trends and indicators. Link: https://pecbms.info/trends-and-indicators/species-trends/; European Bird Census Council. Link: https://www.ebcc.info/trends-of-common-birds-in-europe-2017-update/; Societatea Ornitologica Romana (SOR), Păsări din România. Link: http://pasaridinromania.sor.ro

Lesser Grey Shrike (Lanius minor) species is considered to be declining at EU level and shows large-scale declines from 1999 to 2013.

At Romanian level, data show that the linear trend of the species *Falco vespertinus*, *Lanius minor and Branta ruficollis* from 2012 to 2019 has a slight negative slope (-0.33 for *Falco vespertinus*, -0.17 for *Lanius minor* and -27,8 for *Branta ruficollis*), while the species *Crex crex* has a stable trend, with a very slight positive slope (+0.01). In particular, the species Branta ruficollis shows a very fluctuating trend, indicating a slight decrease of -1.35% in the ratio between the number of individuals and the number of observations in 2019 compared to 2012, and a significant decrease, of -64%, compared to 2016. Since the real enter into force of the NRDP measures was in 2016, to verify possible effects of the programme on habitat conservation related to targeted species, it is hence important to analyse the trend of species for the period 2016-2019. In this period, *Falco vespertinus* shows a slight positive slope (+0.71), indicating an improvement in the condition in respect to previous periods; a similar trend is observed in the case of Otis tarda (+0.05). *Lanius minor* continues to show a negative trend, even if less pronounced (-0.09). Finally, *Crex crex* in the last period shows a slight negative trend (-0.08), with an apparent stabilization in 2019.

The annual values of the observations (as ratio between the number of individuals observed and the number of observations) has been correlated with the annual value of surface engaged and of beneficiaries' number for M10's package 3 (variant 1 and variant 2), from 2015 to 2019, using the Pearson correlation[12]. The correlation (alfa = 0.05 - 1 tile) does not show significative results, mainly because of the low size of the available sample.

The general decline of farmland bird species in last years is mainly due to the absence of nesting places for the reduction of crows in some areas and the intensification of agriculture through the use of pesticides. A declining condition of the farmland bird species is confirmed by the literature review (Sándor and Domşa, 2018). For this, the support to farmland bird habitat conservation (M10) and to organic farming (M11) is fundamental. As shown by data, the increase in the surface supported under M10 and M11, from 2015 to 2019, has allowed to slow down the decline of the farmland species considered in this analysis.

The positive effects of traditional agricultural practices (as supported by M10) and of organic farming (supported by M11), are confirmed by the literature review. For example, the article of Peringer et al. 2016 shows that a low grazing pressures (as equivalent to 0.5ABU/ha) would enhance structural diversity and ecotone cover. Altieri et al., 2017, shows that traditional farming systems allow to maintain the ecological interactions among plant, animal and soil components, avoiding pests and plant diseases. A study of Garbach et al., 2016 shows that win–win outcomes in holistic grazing management systems were associated with biodiversity and habitat provision. Concerning forest conservation, the literature review shows a good status, also in terms of connectivity, in the Romanian forest habitat. For example, the study of Stăncioiu et al., 2018, affirms that a large proportion of forestland (about 85%) had areas large enough to ensure the long-term survival of populations of wild animals associated with forest trees, as a confirmation that management policies and guidelines from

[12] The Pearson correlation coefficient has as a value between +1 and −1, where 1 is total positive linear correlation, 0 is no linear correlation, and −1 is total negative linear correlation.

the last century provide good conditions for connectivity of the main forest tree species and for forests in general.

Results of the survey applied to beneficiaries and experts

The contribution of NRDP to habitat conservation has been also investigated in a more qualitative way through a survey to beneficiaries. The majority of beneficiaries surveyed, with commitments supported both by M10 and M11 (69% - 140/210 respondents) answered that NRDP has contributed to improve the quality of natural environment (65% - 81/125 respondents of M10 and 75% - 64/85 respondents of M11), while 19% of them answered the interventions contributed to maintain the environment unchanged (22% - 28/125 of M10 beneficiaries and 13% - 11/85 of M11 respondents). Only a minority affirms that NRDP has not influenced the environment (7% - 9/125 of M10 surveyed beneficiaries and 5% - 4/85 surveyed beneficiaries of M11). Similar figures appear from the survey to M13's beneficiaries, almost 60% (142/241 respondents) answered that NRDP has highly contributed to the quality of natural environment, 19% of them (46/241 respondents) answered that environment has remained unchanged, and 8% (19/241 respondents) answered that NRDP has not influenced the surrounding farm environment at all. Less than 2% of M13's beneficiaries (3 out of 241) pointed out the environment has become worst as a consequence of the NRDP support.

The results of research activities highlighted the importance of NRDP interventions in bird conservation, although the support provided by NRDP is not perceived as influencing the natural environment in a significant way, considering that it depends on other factors. However, experts suggest lines of improvements for packages and measures. In general, they suggest the adoption of a specific monitoring approach (e.g. a field verification of impacts and the examination of all the influencing factors), and alternative forms of financing (higher intensity for packages over a longer period). In addition, other species or habitats could be included in the list of those addressed by the NRDP measures. With regard to biodiversity conservation, longer-term commitments may have additional benefits compared to short-term ones, as maintaining ecological conditions for a sufficient period of time allows the biotope specific to bird (and other species) populations to be stabilized. However, the interest of beneficiaries to apply for the support provided by the NRDP commitments depends on many factors, such as the attractiveness of the measures (from the financial point of view), the transition costs (switching from one management system to another), ease of implementation, as well as information and support for applicants.

Answer to the evaluation question

Agro-environmental and climate measures contribute to the conservation of important habitats and related species in Romania; although, according to the results of research activities, the net contribution from NRDP measure to biodiversity conservation is difficult to establish, especially in the case of forestry measures (M8 and M15), which at the end of 2019 had a low level of implementation. The great effort of NRDP in supporting biodiversity friendly traditional practices is documented first considering the large increase in surface supported in last years. In addition, in some areas and for specific farmland birds, there is a correlation between the efforts done through the programme and the slow-down in population decline or, in some case, the inversion of the declining trend at local level. However, there are a few exceptions, such as the species *Branca ruficollis*, which has a downward trend during the period analyzed. In addition a high number of ECM measures fall down

under areas in Natura 2000 sites, which demonstrate the relevance of the measure in supporting management plan for the conservation of some priority habitats as identified in the two directives Habitat and Birds.

The results highlighted by the correlation analysis are also supported by literature which usually shows a causality link between environment and climate interventions and biodiversity conservation. Moreover, the perception from the beneficiaries of M10, M11 and M13 confirm the link between NRDP supports and the improvement in the natural environment, including biodiversity, as observed at the level of the committed areas, during the analyzed period.

Difficulties and limitations encountered

Difficulties in data collection and analysis are mainly related to data availability (e.g. indicators on habitat conservation in Romania), as well as their period and geographical coverage. The NRDP effects are observable at territorial levels, as many of the agri-climate environmental packages cover only part of the territory. Analyzing the effects at national level, in average or at aggregate level, does not make always sense. Moreover, the factors influencing biodiversity and habitat conservation at local level are diverse, depending on the location, and complex in terms of cause-effect and species dynamics, making it difficult to disentangle the effects from NRDP measures with other external causes, such as people behavior, urban expansion, pollutions, climate changes and so on. To overcome partially this obstacle, data recently published on farmland birds population in specific areas have been used (as a proxy of the general trend in bird population); while the direct link between specific practices supported by agri-environmental measures and habitat conservation has been established based on the literature in the field. Nevertheless, for a more robust demonstration of the impacts of the NRDP measures a local level, specific analysis at territorial level are needed.

EQ2. To what extent has the NRDP contributed to the provision of environmental services?

Evaluation criteria	NRDP contribution to water quality services NRDP contribution to soil quality services
Measures/sub-measures relevant for the EQ	M08, M10, M11, M13, M15
Indicator from monitoring system	**Common target indicators** R8 / T10: percentage of agricultural land subject to contracts for improving water management (focus area 4B) R9 / T11: percentage of forest land subject to contracts for improving water management (focus area 4B) R10 / T12: percentage of agricultural land subject to contracts for improving soil management and / or to prevent soil erosion (focus area 4C) R11 / T13: percentage of forest land subject to contracts for improving soil management and / or to prevent soil erosion (focus area 4C)

	Common output indicators O1 - Total public expenditure O4 - Number of holdings / beneficiaries of aid O5 - Total area (ha) O6 - Supported physical area (ha) O7 - Number of commitments supported
Other relevant indicator	Pesticide use, Soil quality, Water quality, Forest area

Sources of information and methodological approach

Environmental services are defined as the benefits that people freely derive from the natural environment and from properly functioning ecosystems. Sustainable agriculture and forestry produce several environmental services, the main are soil protection (including carbon sequestration), river basin protection and biodiversity conservation. As biodiversity is the focus of a specific evaluation question, the contribution of measures to sustainable agriculture and forestry and soil and water protection have been analyzed here.

This section focuses mainly on the contribution from M10, M11, M15 and M08, while the contribution from M13 to land management is analyzed more in depth in the thematic question related to climate change adaptation. For soil protection, information on M10 (traditional practices), M08 and M15 (sustainable forestry) from monitoring system (financial support allocated at the territorial level, data from PAIA and AFRI) have been compared with the trend and distribution of soil quality information in the LUCAS database. The objective is to identify a potential correlation between NRDP support and the macro-scale modification of soil quality.

For water quality, data on status and trend of water resources, available from Eurostat / ANAR databases, have been compared with the information regarding M11 in the monitoring system. The link between organic farming and water quality has been underlined, including aspects of pesticide use. The literature review has been used to support the conclusions. The results were supplemented with information obtained by conducting surveys with relevant key actors (eg experts in the field of pedology and environmental protection).

Relevant NRDP measures and packages

According to the logic of NRDP interventions, measure 10, package 4, and measures 13 and 15, contribute directly to soil management, while an indirect contribution is from measure 11 and measure 10 package 5. Concerning water management, a direct contribution is provided through M11, while M10 contributes indirectly to the objective defined under packages P1, P3, P4, P5, P7, P9, P10 and P11. It is worth noting that M10 packages 5 (adaptation to climate effects) is the only contributor to FA5A, related to water efficiency. The supports from M10, M11 and M13 can be cumulated in a certain extend in order to locally strengthens the effectiveness of soil and water management actions.

The number of beneficiaries supported by M13 for which support was granted also through M11 in 2019 is low and represents less than 1% of the total M13 beneficiaries. The percentage is lower for

sM13.1 and sM13.2 (less than 1%) and slightly higher for sM13.3 (approximately 4% of sM13.3 beneficiaries received cumulative support through sM13.3 and M11).

Concerning package 4 measure 10, the total surface supported in 2019 has increased of about +310%, and the number of beneficiaries increases by + 254.7%, compared to 2015. The increase of the support from M10 P4 along the years is particularly relevant since cover crops improves significantly soil hydraulic conductivity and infiltration (Altieri et al., 2017). Moreover, the number of beneficiaries of both M11 and M10 P4 supports were around 190 in 2019 (around 8% of the total).

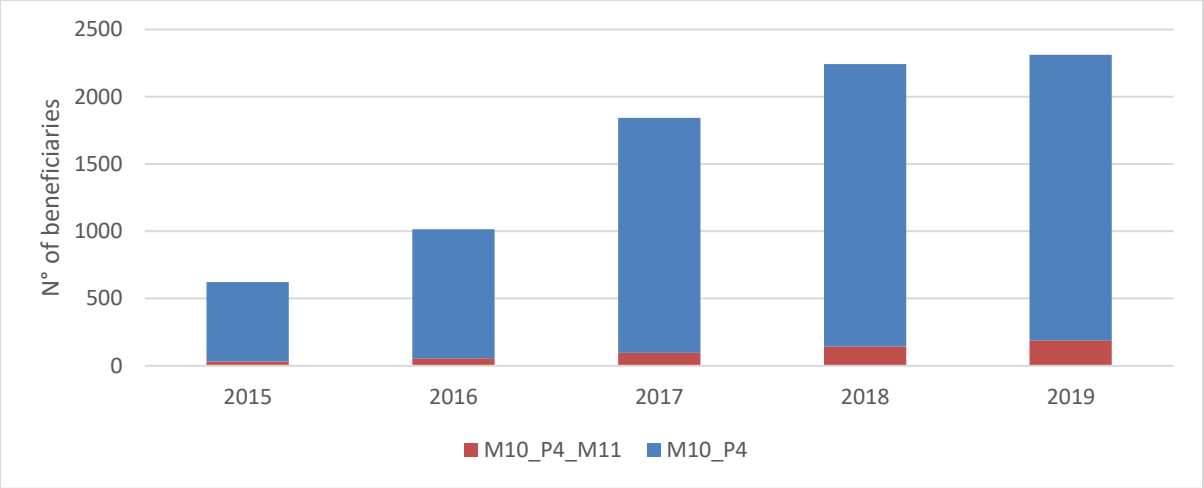

Figure 9: Number of beneficiaries of M10_P4 overlapping with M11, from 2015 to 2019 (U.M.: number; Source: databases provided by PAIA, for the period 2015-2019)

Statistical analysis and literature review for soil erosion

The environmental effects of NRDP on soil can be analyzed verifying the contribution of the NRDP measures in reducing or contrasting problems of soil erosion.

Information on soil erosion by water, are provided by EUROSTAT indicator that assesses the soil loss by water erosion processes (rain splash, sheet wash and rills) and gives an indication of the area affected by such a phenomenon. Soil loss is considered severe when it exceeds 11 tons/hectare/year. Soil erosion rates may change due to change in land cover or soil management (farming) practices (e.g. soil cover, reduced tillage, agricultural works along contour lines on sloping lands, terraces, grass margins). The EUROSTAT indicator is implemented by the LUCAS survey, started in 2009, and with updates in principle planned every 3 years. However, in 2018 and 2019, the survey was not conducted, the latest available data (2016) being used in this analysis. The surface interested by severe soil loss in Romania was 15,695.7 km^2 in 2016 with a decrease of -9.2% compared to 2010.

Table 5: Estimated soil erosion by water - area eroded by more than 11 tons per hectare per year. The percentages referred to the surface affected by erosion compared to the total non-artificial erosive area in the country (U.M.: km2 and percentage; Source: Eurostat. Link: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=aei_pr_soiler&lang=en)

	2000	2010	2016
Surface (km2)	17,288.60	16,158.50	15,695.7
Percentage	8.1%	7.5%	7.3%

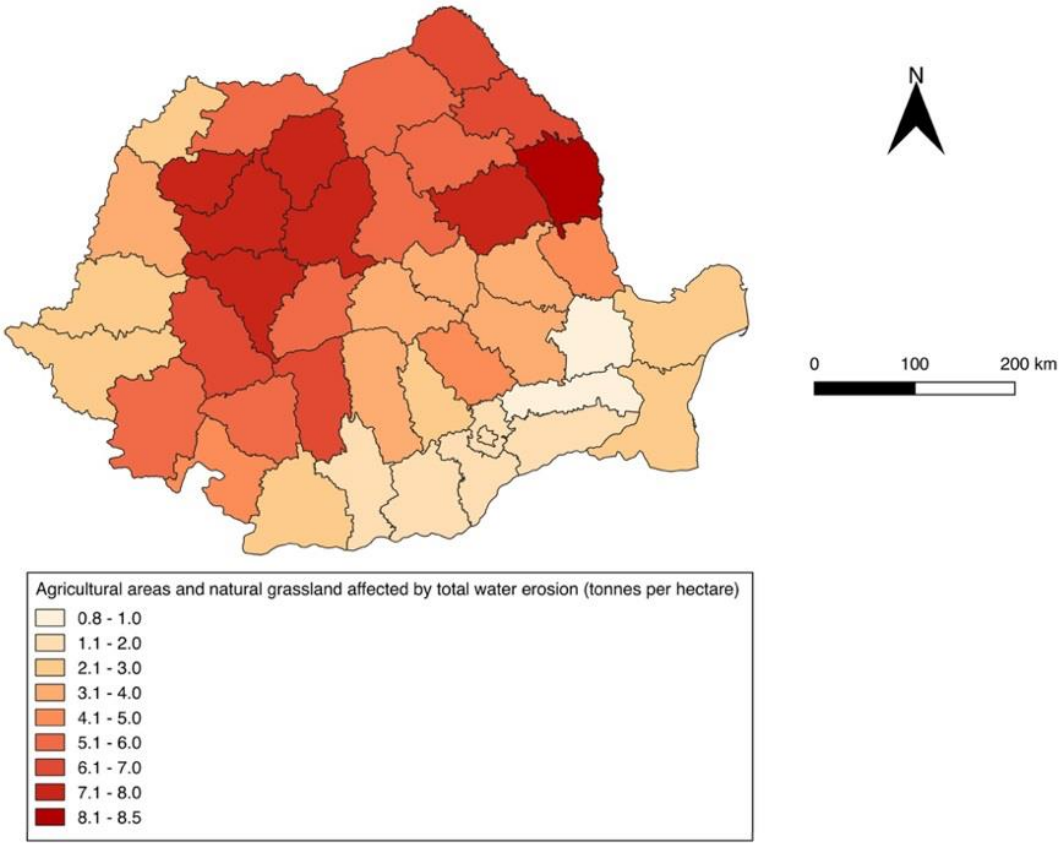

Figure 10: Total agricultural area affected by total water erosion (in tons per hectare at NUTS3 level). Evaluator elaboration based on Eurostat data, year 2016 (U.M.: tons per hectare; Source: Eurostat data. Link: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=aei_pr_soiler&lang=en)

The map above shows that areas most affected by soil erosion by water (> 7 T/Ha) are in the Cluj County (Transylvania region), and in Eastern Romanian counties, such as Vaslui, Bacau and Iași, some of the most populous and industrialized counties in Romania. Forest-Steppe zone, typical of the north-western regions, are characterized by limiting factors of the area, such as drought, erosion, temporary excessive moisture, soil compaction, slope, exposition, groundwater depth, occurrence of white frost period, and early/late frosts (Moraru et al., 2017).

Contribution of measure M10

Concerning the NRDP contribution, the sM 10.1, particularly package 4 (green crops), influences positively the soil quality and contrast soil erosion. Surface engaged of M10 P4 and agricultural areas affected by soil erosion by water has been correlated at NUTS3 level using the Spearman rank correlation (the coefficient varies between +1 and –1)[13]. The results show that there is a slight negative linear correlation (-0.44[14]) between the areas supported by P4 and soil erosion by water data, meaning

[13] Descriptors that are perfectly matched, in terms of ranks, exhibit values r = +1 (direct relationship) or r = –1 (inverse relationship), whereas r = 0 indicates the absence of a monotonic relationship between the two descriptors

[14] Value significant with alfa = 0.05, 1 tile

that where the contribution of P4 of M10.1 is higher, the phenomenon of soil erosion by water is lower.

A contribution of traditional practices in improving soil (and water) conditions is also confirmed by the results of the survey to beneficiaries. Almost 75% of respondents affirmed that traditional practices have contributed to the improvement of water and soil conditions in a significant (31%) or in a lesser (42%) extend, and only 10% answered that traditional practices have not contributed at all.

The positive effect of traditional practices on soil has also been confirmed by the literature review. In particular, Altieri et al. (2017) suggest that cover crops can enhance weed suppression and hence crop productivity possibly through mutual influence on the development of higher plants that grow side by side, through chemicals substances called hills, and via a host of effects on soil quality and fertility and soil moisture. Crop diversification also enhances agricultural and landscape biodiversity and may improve soil organic matter by reducing soil erosion, and improving water quality (Popescu et al., 2018).

Contribution of measures M15 and M08

Other measures of NRDP correlated with soil protection are M15 and M08. Despite the delay in implementation, in 2019, the support provided under sM15.1 covered a surface of 335,497.37 ha with 315 beneficiaries (Packages 1 and 2)[15]. SM8.1 in 2019 has a surface supported of 920 ha corresponding to 55 beneficiaries. Looking at the distribution of M15 support in areas affected by soil erosion, it emerges that M15 support is more concentrated in Maramures, Cluj and Bistrita-Nasaud counties where there are from medium to high level of soil erosion.

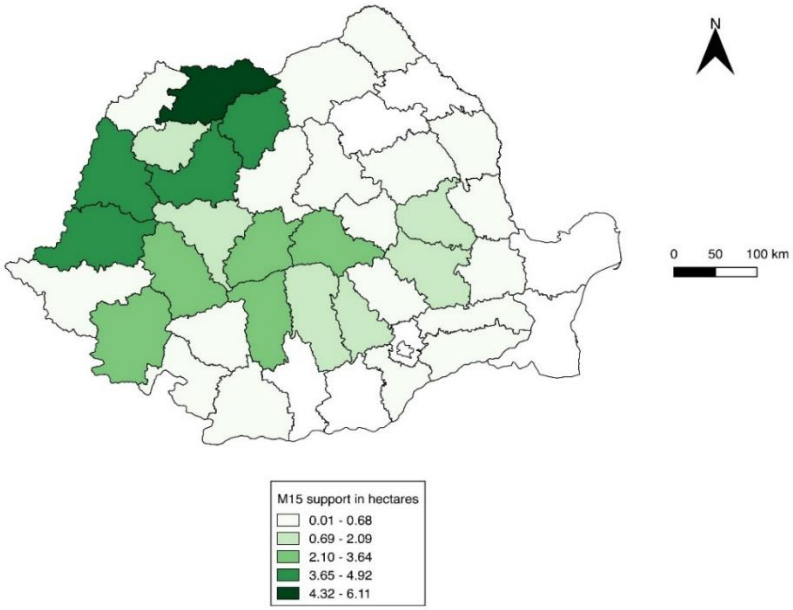

Figure 11: Surface supported by M15 in 2019 at NUTS3 level (scaled by the NUTS surface).

[15] According to the selection report for session no. 2/2019, published by APIA, the area proposed for afforestation / employed in P1 and the area employed in P2 is equivalent to 297,481.14 ha. Source: http://www.apia.org.ro/files/pages_files/Raport_selectie_final.pdf

Statistical analysis and literature review for water efficiency

The support to organic farming (M11 of NRDP) promotes a reduced use of water and a reduction of chemicals with positive consequence on water quality. The support to sM11.1 (payment to convert to organic farming practices and methods) and sM11.2 (payment to maintain organic farming practices and methods) has increased in last years, with an increment from 2015 to 2019 of +736.9% and +818.7% for sM11.1 and sM11.2, respectively.

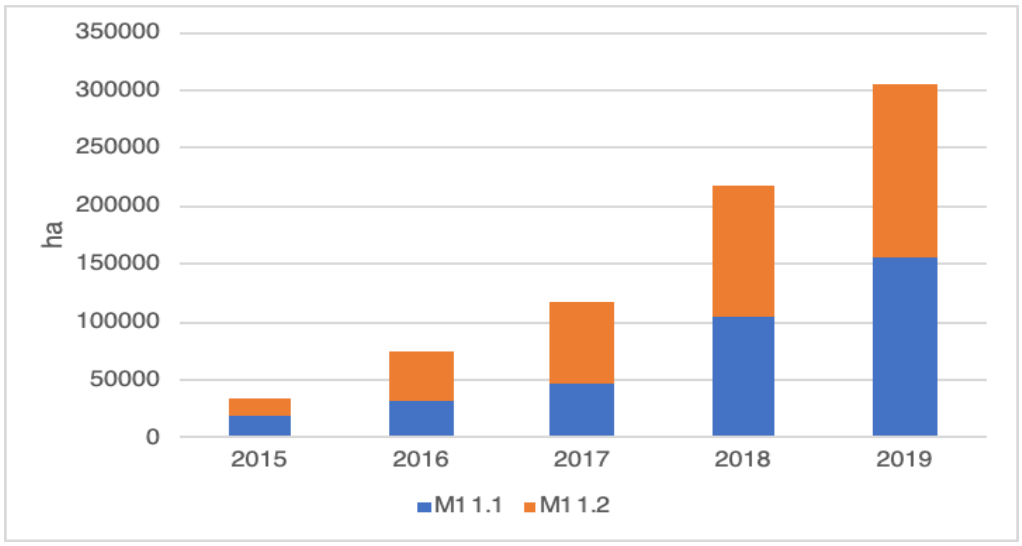

Figure 12: Surface of territory receiving support from sub-measure M11.1 (payment to convert to organic farming practices and methods) and M11.2 (payment to maintain organic farming practices and methods) during period 2015-2019 (U.M.: hectare and number; Source is: PAIA, for the period 2015-2019)

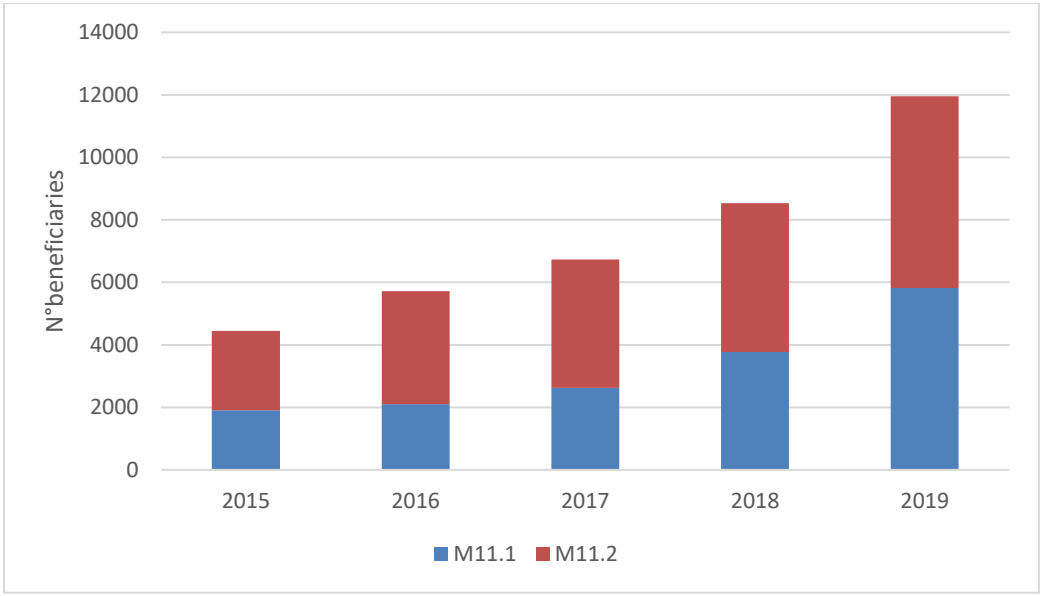

Figure 13: Number of beneficiaries from sub-measure M11.1 (payment to convert to organic farming practices and methods) and M11.2 (payment to maintain organic farming practices and methods) during period 2015-2019 (U.M.: hectare and number; Source is: PAIA, for the period 2015-2019)

The quality of surface water is monitored according to the Water Framework Directive[16], that defines five quality classes (from I – very and good state to V – bad state). The share of quality classes at national level from year 2012 to year 2017 as resulting from the NIS database is shown in the following table.

Table 6: Qualitative status of surface water quality at national level (U.M.: km of supervised rivers) Source: NIS, link: https://insse.ro/cms/files/Web_IDD_BD_ro/index.htm)

Parameters	2012	2013	2014	2015	2016	2017
Total lengths on supervised rivers (km)	*31,621*	*31,892*	*31,263*	*37,111*	*37,612*	*37,605*
I and II classes	18,691	19,591	18,911	21,474	23,036	19,285
III Class	12,877	12,116	11,914	14,811	13,622	16,670
IV Class	11	82	381	634	702	1,061
V Class	42	103	57	192	252	589

Data shows that the majority of rivers fall in class I and II (very good and good status), the trend of monitored quality is descending with 51.28% of water bodies in class I and II in 2017, versus 60.46% in 2014 and 61.25% in 2016.

There are differences in the share of quality classes at basin level, as shown in the figure below and associate table below.

According to the results showed in the map below, higher water quality values are more concentrated in mountain areas or in the North-western side of Romania, while hydrographic basins in bad status are mainly located in the Southern part, that is more industrialized and populated.

Hydrographic basins	First and second class (very good and good status)	Third class (Moderate status)	Fourth and fifth class (poor and bad status)
ARGES-VEDEA	32.52%	51.66%	15.83%
BANAT	65.19%	34.81%	0.00%
BUZAU-IALOMITA	34.25%	65.75%	0.00%
CRISURI	70.39%	19.74%	9.87%
DOBROGEA-LITORAL	34.26%	56.79%	8.95%
JIU	61.55%	36.37%	2.08%
MURES	62.43%	34.24%	3.33%
OLT	59.76%	39.45%	0.79%

[16] Directive 2000/60/EC establishing a framework for Community action in the field of water policy

PRUT-BARLAD	5.96%	86.51%	7.53%
SIRET	71.53%	28.47%	0.00%
SOMES-TISA	54.34%	42.11%	3.55%

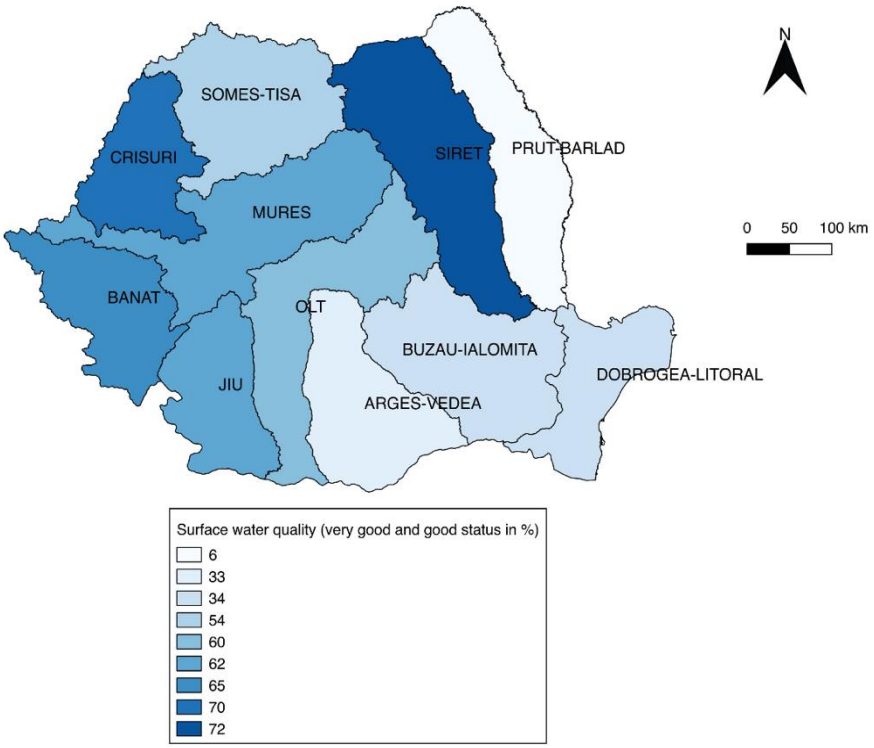

Figure 14: Share of qualitative status of surface water quality for each basin in 2017. Source: NIS the Statistical Yearbook of Romania 2018, referred to data from ANAR 201

The correlation test between water quality and the support given by M11 does not show significant results due to the small sample of the observations that can be used in the correlation analysis (both considering the temporal series or the water basin distribution of observations) and the numbers of concomitant factors, not all depending on agricultural sector (such as urban waste water release), that determine the final water quality.

An important link between agriculture and water pollution is represented by the pollution from nitrates and phosphates. Information at national level on nitrates and phosphates concentration in river has been extracted from WFD and WISE Spatial data[17] (EEA website, based on data reported to EIONET). As shown in the figure below, nitrates concentration, expressed in mg N/l, in 2017 decreased of –16%, compared to 2012, while phosphate concentration, expressed in mg P/l, increased of +2%.

[17] Water Framework Directive (WFD) reference spatial data sets, which are part of the Water Information System for Europe (WISE), and include information about European river basin districts, river basin district sub-units, surface water bodies, groundwater bodies and monitoring sites (Link: http://www.eea.europa.eu/data-and-maps/indicators/nutrients-in-freshwater).

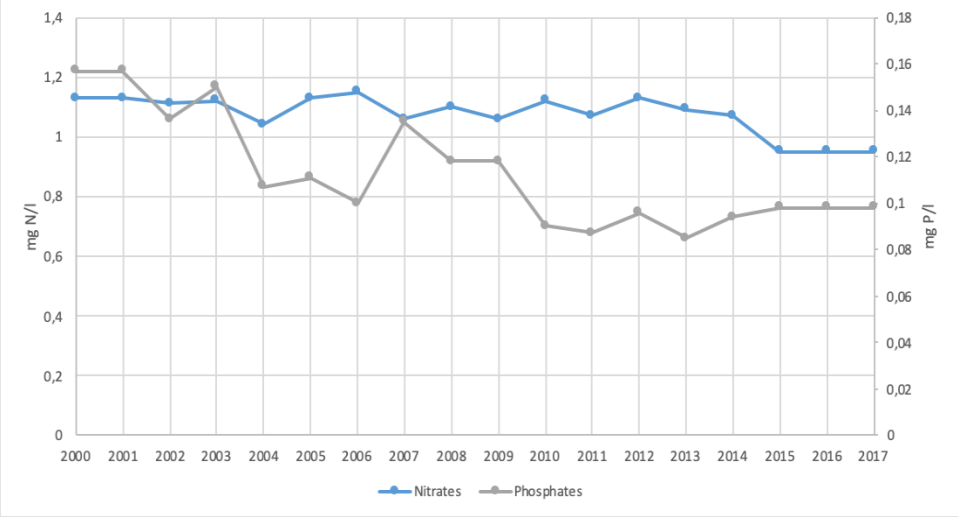

Figure 15: Trend of phosphates and nitrates concentration at national level (unit of measure is mg N/l for nitrates and mg P/l for phosphates). Source: EEA https://www.eea.europa.eu/data-and-maps/indicators/nutrients-in-freshwater/nutrients-in-freshwater-assessment-published-9

The Nitrate concentration in water has been analyzed at basin level, in terms of share of monitored sites falling in quality classes I and II on the total of monitored sites at basin level[18].

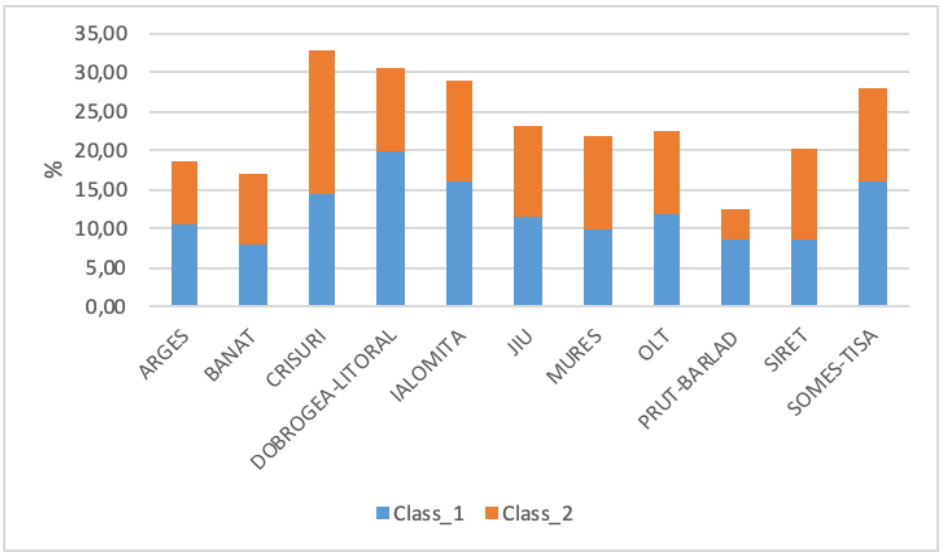

Figure 16: Number of samples within Class 1 and 2 for each basin in 2015 (U.M.: percentage; Source: EEA: http://www.eea.europa.eu/data-and-maps/indicators/nutrients-in-freshwater)

According to the figure above, basin Dobrogea-Litoral shows the high percentage of number of samples in Class 1 and 2 (30.46%), and the trend from 2013 to 2015 shows a decreasing in nitrates concentration of -3.55%, while the lower percentage of number of samples in classes 1 and 2 (good and very good quality) refers to Prut-Barlad basin (12.36%), that shows an increasing trend in nitrates concentration from 2013 to 2015 of +23.5%.

[18]Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources and directive 2006/118/EC on the protection of groundwater against pollution and deterioration.

The percentage of samples in class I and II has been mapped, in order to show the status of each basin sub-site.

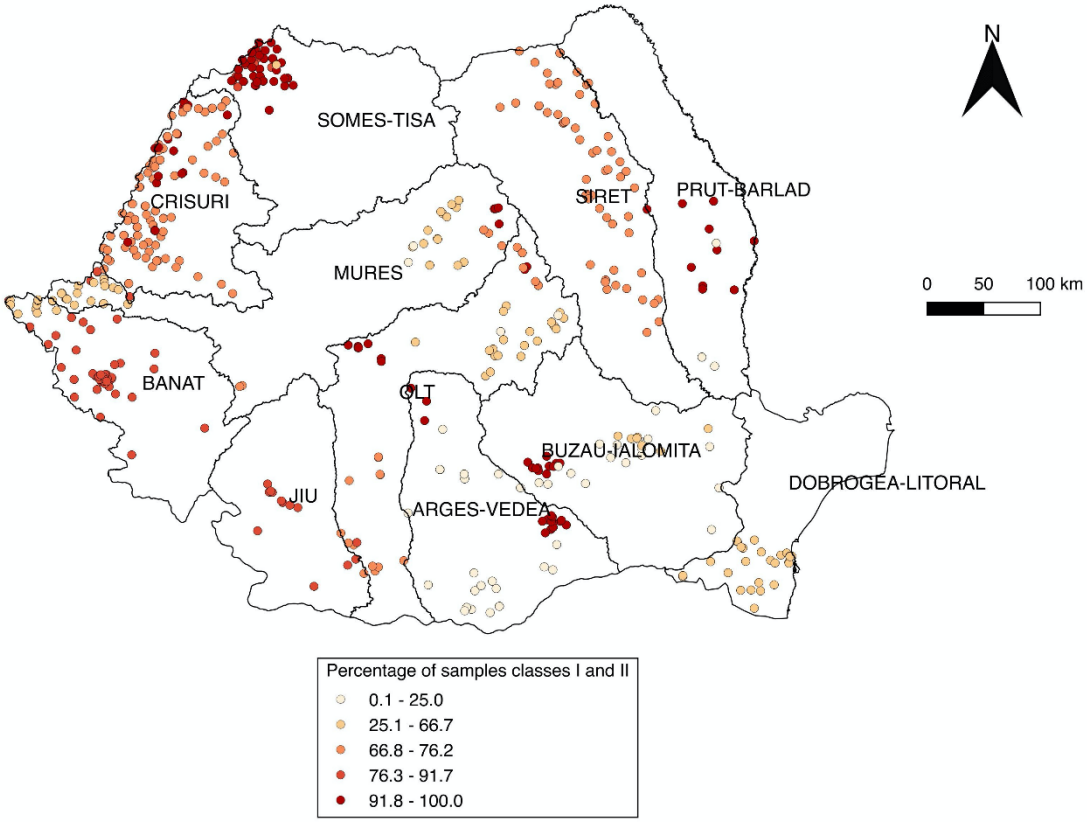

Figure 17: Percentage of samples in Class I and II for each sub-site of the basins. (U.M.: percentage; Source: Evaluator elaboration based on EEA data (https://www.eea.europa.eu/data-and-maps/data/waterbase-water-quality-2).

The correlation at SIRUTA level between the surface supported by M11 and the share of monitored sites in classes I and II doesn't show significant results (correlation coefficient +0.01). This confirms the difficulty in investigating correlation between NRDP support and the change in environmental variables, which trend and evolution is conditioned by numerous external factors.

Results from the beneficiary survey and literature

A survey has been carried out among M11 beneficiaries to investigate about the contribution of NRDP in improving the resources (soil and water); the majority of beneficiaries (64% - 55/68) answered that organic agriculture highly contributes to the improvement of natural resources, while 28% (24/86) of them answered that organic farming contributes in a small extent; only 3.5% of beneficiaries answered that has not contributed at all (and the 4% don't know). Positive effects of organic agriculture are also confirmed by literature. Enhanced levels of ecosystem services in organic systems were reported for services benefitting both on- and off-farm beneficiaries. On-farm benefits included significantly enhanced soil structure and fertility in diverse crops including organically managed apples, and grains. Measures of significantly enhanced soil-related services included increased functional diversity of soil microbes, increased microbial activity, and enhanced colonization by mycorrhizal fungi (Garbach et al., 2016).

Results from the expert survey (water and soil)

A survey has been submitted to expert with the objective to investigate, from a scientific point of view, the contribution from NRDP to environmental services (soil and water quality). When it comes to water quality, the most relevant activities supported though M10's packages are the prohibition in the use of chemical fertilizers and pesticides, the limitation of traditional use in livestock manure, actions leading to an accelerated natural drainage of pastures under commitment are forbidden and the prohibition of works by mechanized equipment in particular areas. Concerning soil, experts notice that soil productivity has remained unchanged in the last five years. In the measure supported with M10 packages, they all agree that application of livestock manure in composted form and the prohibition of actions leading to an accelerated natural drainage of pastures under commitment, are measures strongly contributing to soil conservation. It worth noting that the commitment considered as being less useful for soil conservation is the calendarization of mowing.

Recommendation from experts on how measures and packages can be improved in order to better contribute to soil conservation, deal with impact assessment, financial concentration and the introduction of new intervention schemes, as follows:

- Monitor soil resources at the level of Local Territorial Unit;
- Introduction of green crops (for all spring crops sowing from April);
- Generalization of the conservative agriculture approaches (sowing directly and minimizing any crossing over the field);
- Realization of forest curtains;
- Use of traditional methods of work but with the use of modern means.

Recommendations from experts on how measures and packages can be improved in order to better contribute to water quality concern the support to organic farming and aquaculture in surface water areas. Some of these are already taken on board in NRDP commitments.

Answer to the evaluation question

The agri-environmental and climate supports, especially traditional practices under M10, has enhanced environmental services in terms of soil quality. The analysis of geographical distribution of M10 support has evidenced that where the support is higher, soil erosion is lower. The contribution from NRDP in promoting soil quality is also confirmed by the literature review, experts involved in the evaluation and survey results.

A direct link between environments service related to water quality and NRDP agri-environmental and climate has not been clearly evidenced, due to the complexity of external factors influencing water quality (including the contribution from other NRDP measures). Limiting the analysis to M11 (organic farming) and water pollution by nitrate, even if a significant statistical correlation does not emerge, last data available show a clear reduction in the concentration of nitrate in water. Positive contribution from NRDP to water quality is further confirmed by the survey to beneficiaries and experts, as well as by the literature in the field.

Difficulties and limitations encountered

The specific difficulties are represented by the identification of the linear dependence (causality) between the observed changes at level of environmental variable and the agri-environmental and climate interventions; in addition, dynamics between agriculture practices and soil and water quality involve a number of factors, only few of them are directly related to the commitments under agri-environmental and climate measures. The availability of data at territorial level is also limited and refer to past data sets (last update for Romania at year 2015). These limitations have been partially overcome by the analysis of information from published literature, which document (qualitatively) the causal relationship between agriculture practices supported by the CAP and changes observed in environmental variables.

EQ3. To what extent has the NRDP support contributed to mitigation and adaptation to climate change?

Evaluation criteria	• The contribution of forestry measures to climate change mitigation and adaptation; • The contribution of measures applicable on agricultural land to mitigating and adapting to the effects of climate change.
Measures/sub-measures relevant for the EQ	M08, M10, M11, M13, M15
Indicators from the monitoring system	**Common target indicators** R20 / T19: percentage of agricultural and forestry land subject to the management contracts that contribute to carbon sequestration and conservation (focus area 5E) **Common output indicators** O1 - Total public expenditure O4 - Number of holdings / beneficiaries of aid O5 - Total area (ha) O6 - Supported physical area (ha) O7 - Number of commitments supported
Other relevant indicators	Covering forest areas I07 - Emissions from agriculture

Sources of information and methodological approach

The administrative data have been examined in order to investigate the temporal and spatial distribution of the support offered to the NRDP beneficiaries. Also, in order to investigate the trend, data from external databases on the ratio between forest GHG emission and absorption have been used. A qualitative approach has been used to investigate the net contribution of agri-environment and climate measures within NRDP. In particular, carbon sequestration has been analyzed from the perspective of the variation of the forest area, and the data from the external databases (CLC 2018,

National inventory report of United Nations on Climate Change) have been compared with the information provided by the implemented projects / commitments. Interviews with the representatives of the relevant authorities have completed the analysis, providing additional information on how the measures support adaptation to climate change. At the same time, in order to complete the qualitative information regarding the possible damages caused by the impact / effects of climate change, a questionnaire-based opinion survey has been applied at the level of the NRDP beneficiaries and experts in the field.

Mitigation and adaptation to climate change

The importance of agriculture (and forestry) for contrasting the effects of climate change is stressed in the most recent report of Intergovernmental Panel on Climate Change (IPCC) regarding climate change, desertification, land degradation, sustainable land management, food security and greenhouse gas fluxes in terrestrial ecosystems[19]. The report points out the following agriculture and foresting operations that can contribute to mitigation and adaptation to climate changes:

- Improved management of agricultural land, pastures and manure;
- Agro-forestry;
- Avoidance of conversion of grassland to agricultural lands;
- Integrated water management;
- Improved management of forests and forest restoration;
- Reduced deforestation and degradation;
- Afforestation.

Mitigation of effects generated by the climate changes is addressed though different measures of NRDP, promoting interventions in manure management, renewable energy, energy efficiency, carbon sequestration and emission from land. A direct contribution of NRDP environmental and climate measures to carbon sequestration (FA 5E) is generated by M08, which promotes afforestation, while M11 has an indirect contribution to carbon sequestration (FA 5E), and M10 and M15 contribute indirectly to mitigate the effects of climate change (FA 5D), mainly through soil and biomass management.

When it comes to adaptation to climate change and related risks, the NRDP did not identified specific related interventions, except through package 5 measure 10 which covers arable land located in areas with desertification risks. The contribution to adaptation to climate change is mainly a cross-cutting objective to be addressed by all the relevant agri-environmental and climate measures.

The agri-environmental and climate measures contributing to climate change adaptation are:

- M10 (Agri-environment and climate). M10 promotes the implementation of extensive agricultural practices cumulatively contributing to the sustainable management of natural resources (biodiversity, soil, water), as well as to a decrease in the GHG emissions from agriculture. At the

[19] IPCC, 2019: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.-O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)]. In press.

same time, the promotion of adequate agricultural methods will provide a better adaptation to climate change effects - more and more often manifested as extreme phenomena.

- M11 (Organic farming). Organic farming is generally beneficial in the process of adapting to climate change, though indirectly through a more efficient soil and water management (an higher carbon concentration and water retention in soil).
- M13 (Payments for areas facing natural or other specific constraints). The support provided under the measure for encouraging farmers to continue their agricultural activity on lands located in areas where the practicing of agriculture is difficult and where there is a high risk of abandonment, contribute at the same time to addressing the risk of desertification;
- M15 (forestry, climate and forest conservation services), with the promotion of sustainable forest management, contributes to the reduction of greenhouse gas emissions (through carbon sequestration), enhances ecologic services provided by forests (such as water leakage retention) and improves their capacity to adapt to climate change in the long terms.

All these measures have registered an increase in the support delivered by the programme in the last years, except few packages, suggesting a positive direct or indirect contribution to adaptation to climate change. In what concerns package 5 of M10, “Adaptation to climate change effects”, which is targeting the arable lands located in areas with an increased desertification risk, the package has not yet reached its operational capacity.

GHG emissions and contribution of agriculture to mitigation

Agricultural and forestry practices have a fundamental role both in emission and in removal of GHG, especially through carbon sequestration. Concerning GHG emissions, the role of agriculture and zootechnics are particularly relevant for CH4 and NO2 emissions, especially by manure management.

The national data on GHG emission from agriculture were extracted from the National Greenhouse Gas Emissions Inventory 1989-2017, published by the Ministry of Environment, Waters and Forests (MEWF) - National Environmental Protection Agency (submitted in 2019, hereinafter NIR). The trend considered in the analysis is related to 2012-2017 period, allowing the definition of a reference base for the NRDP implementation.

The total emission of CH_4 from agriculture in 2017 was 508.72 Gg[20] (508,720 tons). The variation in respect to year 2012 indicates a slight decrease of -1.44% (corresponding to a decrease of 7,440 tons starting 2012). This figure includes an increase in the CH_4 from enteric fermentation (mainly linked to an increase in the livestock units) of about +4.63%, whereas the emissions from manure management and from other sources have greatly decreased (-12.65% and - 54.03%, respectively).

The total emission of N_2O from agriculture in 2017 was 21.44 Gg (21,440 tons). The change compared to 2012 is relevant, i.e. an increase of +22.88%, even if the contribution from manure management lead to a decrease of -6.67% (from 2.220 tons in 2012 to 2.070 tons in 2016). The increase is substantially ascribable to the indirect and direct emissions from soil management.

[20] 1Gg corresponds to 10^9 g while 1 ton is 1 10^6 g

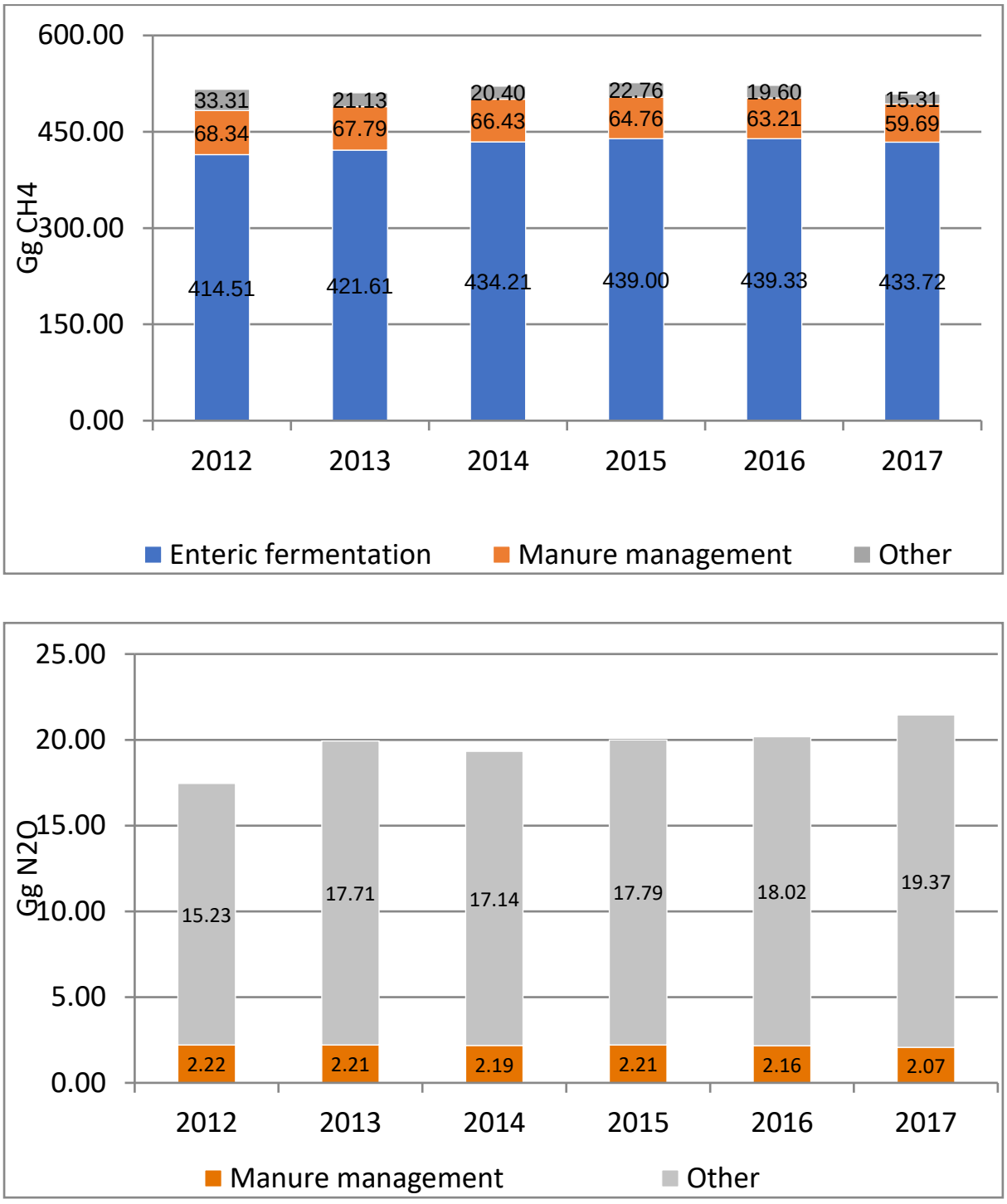

Figure 18: Emission of CH4 and of N2O from Agriculture sector. Source: NIR Romania 2019.

A fundamental role for GHG removal is given by forests. In 2018, in Romania forest and semi natural areas account for 82,764 km^2 (34.72%) of the total surface (238.406 km^2), while artificial surfaces covered 13,279 km^2 (5.57%), agricultural areas 135,330 km^2(56.76%), wetlands 2,986 km^2 (1.25%), and water bodies 4,047 km^2 (1.70%). The share of forest and semi-natural areas is shown at NUTS3 level in the map below.

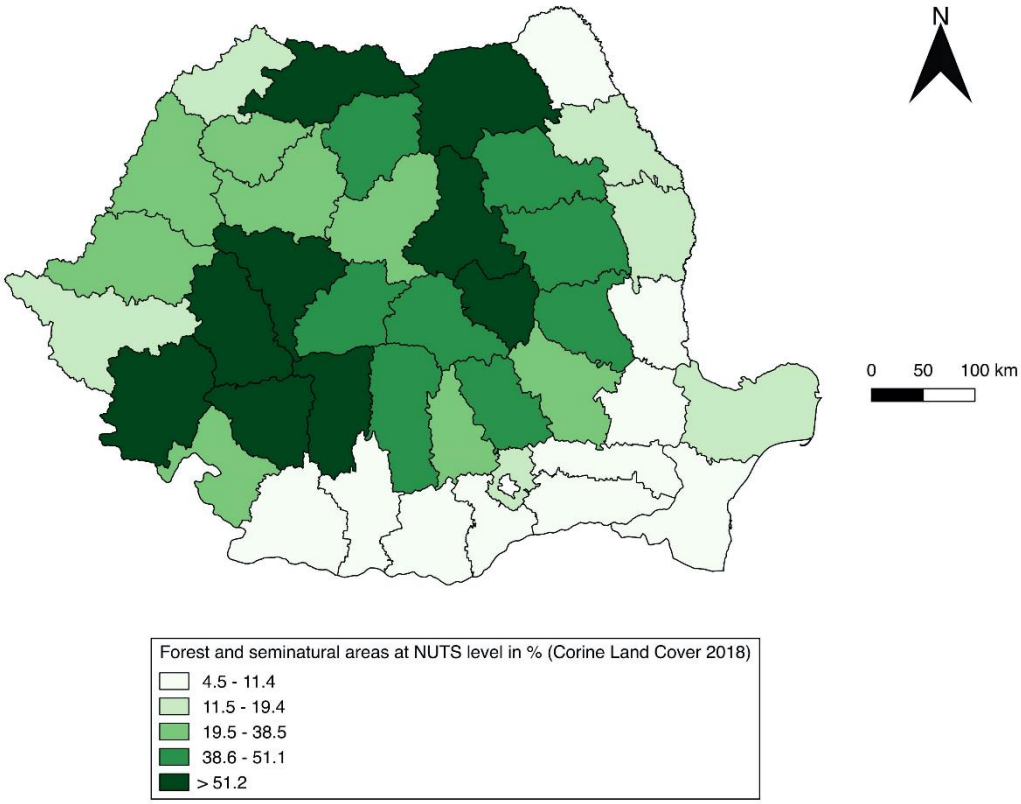

Figure 19: Forest and seminatural areas at NUTS3 level (U.M.: percentage. Source: Evaluator elaboration based on EEA Corine land cover data: https://www.eea.europa.eu/data-and-maps/dashboards/land-cover-and-change-statistics)

Forest have multiple roles on climate. They diminish high temperatures in summer and upgrades cold ones in winter, reducing the maximum values and increasing the minimum values (Platon et al., 2015). Climate change researchers found that forests constitute the most powerful natural environment for CO2 storage for long periods of time but the amount stored decreases from year to year due, in particular, to massive deforestation. CO2 sequestration delivers economic benefit, both in terms of cost savings, avoiding the implementation of more expensive mitigation options, and though increasing the economic value of the forest (with the growth of biomass) (Platon et al., 2015). Regarding the comparison between the land cover data for 2012 and 2018, the table below shows the variation, especially for land covered by pastures, agricultural land and land with significant vegetation areas and forests.

Table 7 Comparison between CLC 2018 and CLC 2012, classes at level 3 and 2. Source: EEA Corine land cover data. Link: https://www.eea.europa.eu/data-and-maps/dashboards/land-cover-and-change-statistics

CLC level3	Values of CLC2018 in km2	Values of CLC 2012 in km2	Variation in respect to CLC 2012 (%)
Pastures	26,223.23	26,427.33	-0.77
Land principally occupied by agriculture, with significant areas of natural vegetation	9,157.13	9,160.84	-0.04

CLC level3	Values of CLC2018 in km2	Values of CLC 2012 in km2	Variation in respect to CLC 2012 (%)
Mixed forest	10,346.79	10,426.64	-0.77
Coniferous forest	11,739.65	12,031.75	-2.43
Broad-leaved forest	48,721.62	48,939.63	-0.45

Data CLC, at a more aggregated level (level 2):

CLC level2	Values of CLC 2018 in km2	Values of CLC 2012 in km2	Variation compared to CLC 2012 (%)
Pastures	26,223.23	26,427.33	-0.77
Heterogeneous agricultural areas	17,495.77	17,479.63	+0.09
Forest	70,808.06	71,398.02	-0.8

Data on level 3 of CLC related to changes in land shows an increment (+0.9%) of heterogeneous agricultural areas, but with a slight decrement of sub-classes “agricultural land with significant areas of natural vegetation” (-0.04%). Also the pasture and forest surface has registered a slight negative variation, for the last category being observed a more significant decrease, especially in the case of the sub-class “Coniferous forests” (- 2.43%), compared to the quasi-trend constant of the sub-classes “Mixed forests” (-0.77%) and “Broad leaved forests” (-0.45%).

The decreasing trend is more visible at level 3 of CLC, compared to level 2.

Despite the slight decrease in forest surface (level of CLC), a net contribution to the emission removals is given by forest management, revegetation and afforestation/reforestation, contributing to a removal of –22,553.89 tons of CO2 eq. in 2017, showing an increase in emission removals compared to 2012 by +4.31%, as shown in the figure below, generated from NIR data.

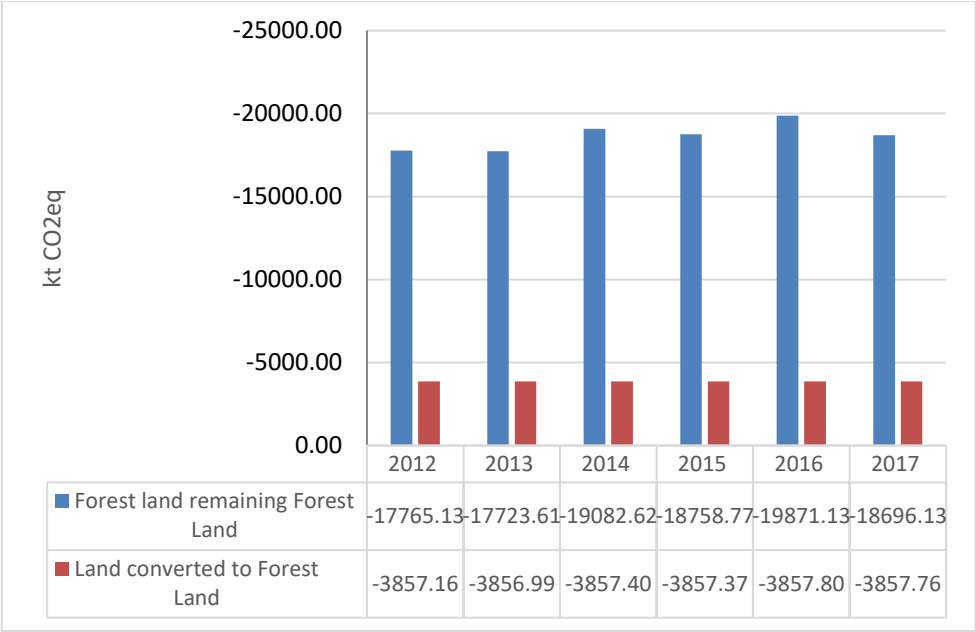

Figure 20: Emission removal from forest land sector from 2012 to 2017. Source: NIR Romania 2019.

Contribution of agriculture to climate change adaptation

The contribution of environmental and climate measures from NRDP to climate change adaptation is cross-cutting. The study provided a qualitative analysis of this contribution, mainly based on the survey to beneficiaries and the expert consultations. Climate change is a problem deeply felt by farmers, as also emerged by the survey. 80% of the respondents (364 out of 455 beneficiaries of M10, M11 and M13) said they have already suffered damages from climate change. This share is higher for M13 beneficiaries than for M10 beneficiaries (86% - 210/244, versus 65% - 81/125). The majority of beneficiaries (50% - 217/418) answered that the damages mainly concern low crop yields (53% - 115/217 of respondents beneficiaries of M13, 48% - 36/75 of respondents beneficiaries of M11 and 48% - 57/118 of respondents beneficiaries of M10), and 24% has signaled damages to agriculture infrastructure and equipment (24% - 53/217 of respondents, beneficiaries of M13, 25% - 19/75 beneficiaries of M11 and 21% - 25/118 beneficiaries of M10).

Other adverse effects deriving from climate change did not emerge as important from the survey, as only 7% (28/410) of respondents complained about damages to water quality, 3% (12/410) mentioned changing in the optimal conditions for breeding animals, 8,5% (35/410) noticed a decrease in soil fertility, 1,7% (7/410) referred to land abandonment and 4% (17/410) pointed out other damages as drought.

Concerning the intensity of the damages due to climate change, the majority of beneficiaries surveyed (52% - 217/418) stated that they suffered medium level damages (42% - 32/76 beneficiaries of M11, 56% - 65/116 beneficiaries of M10 and 53% - 120/226 beneficiaries of M13), whereas 28% - 116/418 mentioned significant damages (25% - 56/226 of M13 beneficiaries, 26% - 30/116 of M10 beneficiaries and 40% - 30/76 of M11 beneficiaries). Only 14,5% (63/418) of respondents indicated small damages (16% - 36/226 of M13 beneficiaries, 14% - 11/76 of M11 beneficiaries and 14% - 16/116 of M10 beneficiaries).

The respondent beneficiaries of M13 stated that they apply adjustments to agricultural practices and adapt their activities due to climate change. These adjustments were mainly related to introduction of technologies for collecting water or conserving soil moisture (for example, retaining soil crop residues, minimal soil tillage methods), according to 39% (96/244) of the respondents. A significant share (28% - 69/244) mentioned changes in varieties / species used, with others more suitable for thermal conditions and / or with increased resistance to heat shock and drought. Changes in fertilizer uses are applied by a small share of respondents (13% - 31/244), and the same situation is encountered with the frequency of water use through irrigation practice (9% - 22/244). Only 5% (12/244) does not put in place any measures to adapt to climate change. These adjustments entail additional costs, mainly related to equipment (mentioned by 61% - 57/93 of respondents), inputs (20% - 19/93) and time allocated (7.5% - 7/93). For a small share of respondents (9% - 8/93), the changes introduced do not produce any additional costs. These adjustments also led to loss of income, according to the majority of M13 beneficiaries (70% - 167/240). The income loss is mainly related to the higher cost of the inputs used (69% - 194/283), or to the lower volume of production (27% - 75/283), and finally to the changes in the quality of the product obtained (3% - 9/283).

Results of the survey applied to experts

Two different surveys have been distributed to experts in the field: one about climate change, agriculture (section 1) and forests (section 2), while the other specific questionnaire was distributed to the representatives of the Forest Guards.

Regarding the change of climatic conditions, the experts indicated that in the last 10 years, the annual average temperature has increased and both annual distribution and regime of precipitations have changed. Forest experts confirm that in the last 10 years the quality of forests has improved and their role in carbon sequestration has increased. About the contribution of NRDP to adaptation to climate change, experts agreed that the most relevant measures/activities are:

- The creation of new portions of forest and the increment of the diversity in forest species;
- Efficient irrigation system (this is not directly related to agri-environmental and climate measures);
- The change/introduction of new methods/tools for collection and transport of wood, more friendly for soil.

According to experts consulted, the NRDP measures could be improved to better contribute to climate change adaptation, enforcing agricultural practices beneficial for the climate and the environment, such as crop diversification, maintaining existing permanent meadows and areas of ecological interest.

The representatives of Forest Guards confirmed the contribution of forests to environmental and climate services, particularly in terms of water and soil improvement and habitat and species conservation. However, M8 contributes to the NRDP objectives of priority 4 and 5 in a small extent, due to the low effectiveness and efficiency of the implementation of the projects and the administrative burden affecting the applicants. When it comes specifically to adaptation to climate change, the main contribution from M8 is through afforestation in forest deficient areas and through the creation of forest protection curtains. According to some of the respondents, afforestation of the lands located in ATU affected by phenomena of desertification, erosion or salinization should be of major added value.

According to some of the representatives of the Forest Guards, maintaining the same approach for the next programming period (meaning the same measures in the same areas) could be an option; while other required modifications in order to improve the efficiency of the measures related to mitigation and adaptation to climate change[21].

[21] Among the aspects that need improvement, mentioned by the representatives of the Forest Guards, are the following: New eligibility and selection criteria in the submission phase, without presenting concrete proposals; Introduction of simplified procedures for managing commitments at the level of beneficiaries; Concentration of financial resources on several types of interventions; Other specific adjustments, such as the inclusion of faster-growing species in afforestation and the modification of afforestation areas (minimum 0.25 ha, with a length / width ratio that allows the creation of forest bodies). However, it should be noted that not all the elements indicated by the respondents in the interviews / questionnaires are consistent with the legislative provisions in force, so that certain recommendations and hypotheses collected during these activities could not be confirmed or validated following the evaluation process.

According to the opinions expressed by Forest Guards representatives, M15 contributes to the NRDP objectives related to priority 4 and 5 in a greater extent than M8, even if its contribution is difficult to quantify due to the fact that the areas involved are only at the beginning of their second year of commitment. Some respondents also mentioned the administrative burden and the low financial support provided, as factors that could affect the contribution of M15 to the NRDP objectives. According to some of the Forest Guards representatives, maintaining the same approach for the next programming period (meaning the same measures in the same areas) could be an option, while other respondents required new eligibility conditions, the introduction of simplified procedures and the concentration of financial resources.

Finally, the answers to the 57 questionnaires received from forest owners of the Romanian Foresters Association have been exploited. According to most of the respondents, in the last ten years, the forest surface and the quality of forests has decreased in the areas they exploited. Therefore, the role of forest as carbon sink has diminished. Concerning the question on how NRDP measures could be improved in order to better contribute to climate change adaptation, the majority of the respondents (74%), answered that more concentration of financial resources and the focus on few typologies of interventions is needed; for example by financing the research on the genetic improvement of planting materials, the use of eco-friendly and low environmental impact-technology, investments in forest road infrastructure through national programs, or by increasing the effort in regeneration/afforestation of degraded lands. Other respondents (44%) mentioned the increase of funding for environment, less bureaucracy, or the creation of curtains protection areas. Only 21% of the respondents consider that it is not necessary to change the current forestry measures.

Answer to the evaluation question

The forests in Romania have a positive contribution to carbon sequestration, however the contribution from M8.1 is still limited, considering the number of beneficiaries, the location of interventions and the surface covered. Direct contribution to climate change adaptation from package 5 measure 10 is still limited also due to delays and challenges met in the implementation phase. The main problems are related to the level of information and relatively low support provided to stakeholders (given the novelty of the package), as well as the complexity of the requirements to be met during the implementation period - the main impediment is to ensure crop rotation (in 2 consecutive years farmers must use at least 3 different crops out of the 4 eligible (maize, sorghum, sunflower, soybeans) but also the condition to grow at least 2 hybrids at the same time.

However, starting 2018, the surface covered is increasing. In general, the contribution from other agri-environmental measures can be assessed as being positive, considering the contribution of interventions dealing with soil and water management, as well as biodiversity conservation which are related to carbon sequestration (package 4 of M10) and contributing to the reduction of the frequency and intensity of natural hazards (such as soil erosion).

Difficulties and limitations encountered

The limitation generated by the low level of implementation of forest measures, with few projects implemented, makes it difficult to identify a solid link between the NRDP interventions and the effects observed in mitigating and sequestering carbon dioxide. In addition, the low progress reported in the

implementation of M10 - P5, as well as M8 and M15 (during the period considered for the study) does not allow the assessment of the contribution of NRDP environmental and climate measures in reducing the risk of desertification. Adaptation to climate change could only be investigated based on a qualitative approach and considering evidences from literature (e.g. IPCC report).

EQ4. To what extent has NRDP contributed to the sustainable development of rural areas?

Evaluation criteria	NRDP contribution to reducing the risk of abandonment of agricultural activities NRDP contribution to the promotion of traditional agricultural practices
Measures/sub-measures relevant for the EQ	M10, M11, M13
Indicators from monitoring system	**Common target indicators** R10 / T12: percentage of agricultural land subject to contracts for improving soil management and / or prevent soil erosion (focus area 4C) R11 / T13: percentage of forest land subject to contracts for improving soil management and / or prevent soil erosion (focus area 4C) **Common output indicators** O1 - Total public expenditure O4 - Number of holdings / beneficiaries of aid O5 - Total area (ha) O6 - Supported physical area (ha) O7 - Number of commitments / commitments supported
Other relevant indicators	Not the case

Methodological approach

NRDP allows the implementation of agricultural practices cumulatively, contributing to a sustainable management of natural resources (biodiversity, soil, water), through measures M10, M11 and M13. The link between M10, M11 and M13 and sustainable development in Romania is investigated mainly in a qualitative way, using different evaluation approaches. A consistency analysis was first undertaken, comparing NRDP measures and the objectives of the Romanian Sustainable Development Strategy (RSDS 2019), in order to demonstrate the coherence of both documents. Subsequently, a general analysis of the Romanian specialized literature in the field was performed, confirming the connection between RSDS and the agri-environment and climate measures. In a third step, a survey conducted with beneficiaries of NRDP, explored some specific aspects of sustainable development, related to the implementation of traditional agricultural practices (M10) and organic agriculture (M11) in rural areas, while the reasons to land abandonment were analysed based on the answers provided by the beneficiaries of measure 13.

Contribution of NRDP to the Romanian Sustainable Development Strategy 2020-2030

In the RSDS, agriculture (pillar 1 and 2) is assumed to play a key role in supporting sustainable development by contributing directly to the achievement of objectives 2, 6, 7, 11, 13 and 15. Several

NRDP measures under priority 2, 3, 4, and 5 contribute directly or indirectly to the achievement of the objectives defined in the RSDS. NRDP supports also strategies for sustainable development of specifics area with natural constrains, as defined in the document 'National Strategic Guidelines for the Sustainable Development of the Less-Favoured Mountain Area 2014-2020' and in the 'Integrated Strategy for Sustainable Development of the Danube Delta'[22].

Sustainable Development Goals (SDGs)	Policy target 2020	Policy target 2030	NRDP measures
SDG 2 'Zero hunger'	• Implement the National Programme for the Rehabilitation of the Main Irrigation Infrastructure in Romania; • Support the production and diversification of indigenous species with a high genetic value, but deficient in the internal market, in areas such as vegetable growing; • Increasing the number of valuable breeds of pigs, cattle and buffaloes, the poultry sector, wool collection and marketing, beekeeping, fishing and aquaculture, including by stimulating research and development in the field of agri-food; • Increasing the number of products recognised at European level/certified traditional products/certified established recipes; • Support and attract young farmers; • Increasing the number of active farmers registered within the organic farming system and increasing the amount of organic certified agricultural land; • Increasing the number of applicant groups/economic operators registered within national and European quality schemes; • Promote good agricultural practices in order to prevent and combat soil pollution.	• Finalisation of the agricultural cadastre; • Double the share of agriculture in Romania's GDP relative to 2018; • Maintain and increase the genetic diversity of seeds, crops and farm, and both domestic animals and related wild species; • Increasing the degree of capitalization of local agricultural production; • Increasing the share of organic agriculture in total agricultural production; • Preserve and capitalise on occupations and traditional uses of medicinal plants and forest fruit in mountain areas; • Maintaining local traditions by increasing the number of products with special characteristics in terms of geographical origin.	Measure 4 Measure 6 Measure 10 Measure 7 Measure 11 Measure 13 Measure 19
SDG 4 'Quality education'	• Promote entrepreneurial culture and the necessary skills throughout the education system by reopening	• Establish the regulatory framework for the running of continuing training programmes	Measure 1 Measure 19

[22] https://www.madr.ro/orientari-strategice-nationale-pentru-dezvoltarea-durabila-a-zonei-montane-defavorizate-2014-2020.html and https://www.madr.ro/investitii-teritorial-integrate-in-delta-dunarii.html

Sustainable Development Goals (SDGs)	Policy target 2020	Policy target 2030	NRDP measures
	and/ or modernizing school workshops in vocational and technical education; organize entrepreneurial competitions based on projects with practical applications within and between different educational institutions; encourage voluntary mentoring activities and partnerships with the local business community; expanding student entrepreneurial societies and encouraging their cooperation with economic agents based on contracts, by developing partnerships between universities and representatives of the entrepreneurial community.	and encourage participation in such programmes; establishment of community-based permanent education centers; involve companies in supporting employee enrolment in such programmes; • Support the education process through out-of-school and extra-curricular programmes in order to promote education for health, civic, cultural and artistic, scientific and ecological education, and education through sport.	
SDG 6 'Clean water and sanitation'		• Substantially increase the efficiency of water use in industrial, commercial, and agricultural activities; expand the rational reuse of treated and recycled water with a view to meeting the objectives of a circular economy; • Improve water quality by reducing pollution, eliminating waste disposal, and reducing to a minimum the amount of chemical products and dangerous substances, thereby reducing the proportion of untreated waste water, and significantly increasing recycling and safe reuse.	Measure 4 Measure 6 Measure 7 Measure 10 Measure 11
SDG 7 'Affordable and clean energy'	• Maintain an optimum energy mix by exploiting the country's own resources, diversifying import sources and export destinations, modernizing and improving the efficiency of existing viable infrastructure, and promoting renewable energy sources and low carbon conversion technologies.	• Decouple economic growth from the process of resource depletion and environmental degradation by substantially boosting energy efficiency (by a minimum of 27% compared with the status quo scenario) and the extensive use of the EU Emission Trading Scheme (ETS) in stable and predictable market conditions.	Measure 4 Measure 6 Measure 19
SDG 8 'Decent work and economic growth'	• Supporting the activity of small and medium-sized enterprises and entrepreneurship among young people by encouraging and	• Promoting development-oriented policies that support productive activities, the creation of decent jobs,	Measure 6 Measure 7 Measure 16 Measure 19

Sustainable Development Goals (SDGs)	Policy target 2020	Policy target 2030	NRDP measures
	providing financial support for start-ups; • Creating and implementing a coherent plan for the development of tourism, including agritourism, a considerable generator of work and income, by improving infrastructure and access ways to tourist destinations, professionalizing staff and wisely exploiting cultural traditions and national characteristics; • Exploiting the potential of capital markets and other financing instruments, including public-private partnerships.	entrepreneurship through start-ups, creation and innovation, and which encourage the formalization and growth of micro, small and medium sized enterprises, including through access to financial services; • Achieving high levels of productivity through diversification, technological modernization, and innovation, including through focusing on sectors with high added value and a more intensive use of the workforce; • Creating a tourism sector that is competitive in the long term, developing agritourism, ecotourism, and rural, spa and cultural tourism, and improving Romania's image as a tourist destination.	
SDG 11 'Cities and sustainable human settlements'	• Increasing the share of properties recorded in the land register in all localities to 80% for buildings and completing the registration of agricultural lands subject to subsidies allocated by the Payment and Intervention Agency for Agriculture, as a basic element of spatial and land-use planning	• Consolidate efforts to protect and safeguard cultural and natural heritage and landscape features from the rural and urban environment.	Measure 7 Measure 19
SDG 13 'Climate action'	• Integrate measures to adapt to climate change into the strategies and sectoral development policies and pursue their intersectoral harmonization.	• Strengthen Romania's resilience and capacity to adapt to climate-related risks and natural disasters; • Intensify Romania's efforts to achieve the transition to a "green" economy, characterized by low carbon dioxide emissions and resilience to climate change, and to integrate measures with a view to adapting to climate change in vulnerable economic, social and environmental sectors, according to EU policies.	Measure 10 Measure 11 Measure 17

Sustainable Development Goals (SDGs)	Policy target 2020	Policy target 2030	NRDP measures
SDG 15 'Life on Land'	• Ensure the conservation, reestablishment and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and infertile land, in accordance with the obligations deriving from international agreements.	• Conservation and protection of wetland areas, including the Danube Delta Biosphere Reserve, a unique wetland in Europe, as part of the European and world natural heritage; • Ensure the conservation of mountain ecosystems, including their biodiversity, with a view to boosting their capacity to provide essential benefits in terms of sustainable development; • Sustainably management of forests, eradicate illegal logging, develop an integrated digital system for the monitoring of the exploitation and transport of timber, including at border crossings, ensure the afforestation and reforestation of forest land or land that has been degraded or subject to desertification, and implement the planned planting of forest curtains for the protection of agricultural crops and elements of infrastructure for limiting the impacts of climate change; • Pursue the transition to a circular economy through complementary approaches involving traditional methods and the latest technologies in order to re-establish/rebuild the natural capital and reduce dependence on synthetic fertilizers and pesticides, with a view to combating soil degradation; • Combat desertification, restore degraded land and soil, including land affected by desertification, drought and flooding.	Measure 8 Measure 10 Measure 11 Measure 13 Measure 15

The link between agri-environmental and climatic measures and the RSDS can be investigated more in details considering the specific contribution of M10, M11 and M13 to sustainable development in rural areas.

- **M10** agri-environmental and climate payments and support to traditional practices, promoting traditional approach and manual works in the holding

Payments from M10 are made based on commitments defined in 11 packages implemented over the period 2014-2020. Packages contribute directly to FA 4A and 4C and indirect to FA 4B, covering biodiversity, soil and water management and indirect to FA 5D and 5E. Some packages are related to specific areas, while others cover the entire national territory. Contribution to RSDS is mainly due to SDGs 6, 13 and 15 addressing environmental issues. Indirect contribution to social-economics goals through SDGs 8 (related to employment) and 11 (cultural heritage) can be also inferred from the typology of intervention supported, the type of beneficiaries and their location. For example, package 2, coupled with package 1, covers mountains and hilly areas, characterized by their high biodiversity, and at the same time cultivating land using traditional farming practices, more labor intensive and with less mechanization.

- **M11** - organic agriculture, through the development and maintenance of agriculture in rural areas with a low environmental impact

M11 is made of two sub measures targeting organic farms in rural areas. Commitments are reunited in 5 packages covering crops on agricultural lands, orchards, vineyards and medicinal plants. Packages under M11 contribute directly to FA 4B and indirectly to FAs 4A and 4C as well as FA 5E. Links between organic farming and SDGs are multiple, as M11 directly contributes to the environment sustainable goals 2, 13 and 15 and, indirectly, addresses employment in rural areas (SDG 8), as pointed out in the NRDP "the higher labor requirements for organic farms compared to conventional farming create better employment opportunities in rural areas".

- **M13** – reducing land abandonment in mountain areas

M13 supports agriculture practices in areas facing natural handicaps and contribute to priority 4. Three type areas with natural constrains have been defined within the NRDP: mountains areas, areas facing significant natural constrains and areas in the Danube Delta (overlapping with the Danube Delta Biosphere Reservation). Payments are compensation for losses in terms of productivity and production capacity due to climatic and geographic limitation factors. M13 directly addressed SDGs 2, 13 and 15 but also SDGs 8 (related to tourism) and 11 (cultural heritage) as mentioned in the NRDP "the continuation of agriculture in these areas also play an important role in the preservation of traditional landscape, and can constitute the basis for economic development, through rural tourism"

Evidences from literature review and the survey applied to beneficiaries

Organic agriculture is a very promising field for ensuring sustainable development (Ionescu et al., 2018). As it emerges from literature, Romania has a great potential for the development of organic agriculture, especially due to the large number of available farmland and reduced use of fertilizers and other chemicals. However, the development of organic farming in Romania is in an early stage, due to the numerous problems that Romanian agriculture is still facing. Promoting organic agriculture by Romanian farms can be done through the development of marketing strategies that can stimulate both consumption and production of organic products (Aceleanu et al., 2016). Organic farming has potential to increase net returns, reduce the risks of crop failure and reduce environmental impacts (Vasile et al., 2015). Moreover, the implementation of good agricultural and environmental farming practices within the agricultural holding, such as crop diversification promoted by the CAP, has

brought economic and environmental benefits, with an increment of agricultural productivity (Popescu et al., 2018). Altieri et al. 2017 states that traditional farming systems allow to maintain the ecological interactions among plant, animal and soil components, which promote key processes such as nutrient cycling, pest regulation and productivity. These systems exhibit a lower incidence of insect pests and plant diseases.

A survey has been conducted with beneficiaries of NRDP in order to investigate the efficiency of NRDP intervention in addressing sustainable development. Concerning land abandonment, the majority of beneficiaries of M10, M11 and M13 states that NRDP has successfully contributed to the decrease of the risk of land abandonment in rural areas (52% - 128/244 of M13 beneficiaries, 38% - 33/86 of M10 beneficiaries and 42% - 52/125 of M11 beneficiaries). 12% of M10 and M11 beneficiaries and 10% of M13 beneficiaries consider that NRDP has not contributed to reducing the abandonment of agricultural land; while the cause-effect relationship remains uncertain for few of them, i.e. 13% of M13 beneficiaries, 15% of M10 and 13% of M11 beneficiaries.

Finally, concerning the NRDP contribution to pursue farming activities, the majority of beneficiaries states that NRDP has influenced their decision to continue activities within the holding (66% - 80/122 of M11 beneficiaries, 73% - 53/73 of M10 beneficiaries and 56% - 133/237 of M13 beneficiaries), while several of them states that NRDP has influenced their decision to continue activities within the holding in a small extent (25% - 18/73 of M11 beneficiaries, 23% - 28/122 of M10 beneficiaries and 28% - 67/237 of M13 beneficiaries). Only 9% (37/432) states that NRDP has not influenced at all their decision to continue activities within the holding and for 5% (22/432) of them, the link is not clearly established.

Answer to the evaluation question

The supports provided by the three measures above mentioned contribute directly and indirectly to the achievement of several sustainable development goals, as illustrated in the RSDS, tackling at the same time issues related to biodiversity loss, the conservation of sustainable traditional practices in rural areas (as key element of local cultural heritage), as well as employment and rural development issues in a long-term and broader spatial view.

Moreover, the literature review shows the potential strong link between sustainable development and agriculture in Romania, specifically when it comes to organic farming. Finally, as it emerges from the survey and considering some more specific aspects linked to sustainable development, the respondents has confirmed the contribution of the NRDP in terms of maintenance of farming in rural and mountain areas, reducing land abandonment and preserving traditional practices profitable both from a natural and socio-economic and cultural point of view.

Difficulties and limitations encountered

Definitions of what sustainable development is are varied; NRDP neither proposes a unified definition nor indicators allowing the measurement of progress toward a more sustainable development in rural areas. The terminological gap was partially filled, conducting an analysis of the coherence of agri-environment and climate measures of NRDP with the RSDS objectives, as well as of the results highlighted by the survey, which confirms the effectiveness of NRDP support in maintaining agricultural activities and related socio-economic benefits in rural areas.

5. General conclusions and recommendations

The general recommendations are intended to improve the efficiency, effectiveness and impact of the NRDP, both for the end of the current programming period and for the future programming period. The recommendations are structured in four main sections, based on the evaluation questions and areas of analysis. A general cross-cutting recommendation addresses the need for stronger support from the program for evaluation activities in the collection of data on agri-environment and climate issues (soil, water, biodiversity and natural hazards). The recommendation appears in the context in which certain information / data is not available or is not updated (see, for example, the case of the *Farmland Specific Bird Index*), which prevents a correct assessment of the program's contribution to achieving the quality objectives. environment.

According to the proposed methodology, the conclusions and recommendations are based o a detailed literature analysis (programming document and relevant specialized documents), quantitative information (monitoring data of MA and PAIA) and qualitative information (obtained from interviews with representatives of MA, PAIA and other relevant key actors). In addition, the evaluation team developed a detailed analysis, at measure / sub-measure / package / variant level identifying the degree in which each condition provided by PNDR 2014-2020 (eligibility, basic, specific) is adapted to the objectives associated with each area of intervention. Thus, the relevance of the conditions associated with agri-environment and climate commitments is highlighted, while formulating specific recommendations / alternatives for improvement, for the next programming period, where appropriate.

How to enhance the contribution from PNDR to conservation issues?

Conclusions:

- The level of support to biodiversity conservation needs to be maintained, especially through Measures 10 and 11 which cover large parts of the Romanian territory, including in Natura 2000 sites and protected areas. The contribution of M13 - support for areas facing natural or other specific constraints - to biodiversity conservation and restoration objectives is not direct (as the measure does not define specific conditions to be applied to improve biodiversity conservation). However, in Romania, especially regarding mountain areas, M13 covers regions characterized by a high natural value (HNV) and a rich biodiversity. In addition, the PNDR allows for a coupling between M10 and M13, ensuring a better impact on biodiversity from M13 interventions;
- The zoning approach adopted for biodiversity conservation under M10 is correct;
- Delays in the implementation of sM 15.1 make it difficult to analyze the effects of interventions so far, although the area employed at the sM level has increased in recent years.

Recommendations:

- At the same time, there is a need for local evaluation of impacts and a periodic re-examination of the relevance of interventions, and target species, based on observations made at

territorial level; A study could be assigned to experts (such as ROS), and renew regularly indicatively mid-terms and at the end of the programme. The study should allow either 1) confirmation or modification of the intervention logic of the package, 2) extension or redefinition of the areas covered, 3) adjustment of commitments (based on the experiences gained by the beneficiaries) and/or 4) allocation of a higher budget. M13 is more generalist and not directly tailored for biodiversity conservation (with no specific commitments). Efforts to couple supports under M13 and packages in M10 must be developed to strengthen the link between land management in areas with natural handicap and biodiversity conservation in general; It is recommended do not associate in a systematic way in the next programming period, M13 interventions with biodiversity conservation objectives except when areas covered are of HNV, located in protected natural areas or targeting protected species or in Natura 2000 sites. In addition, more specific indicators must be defined at measure level such as the *areas falling under Natura 2000 sites*;

- Considering the role assumed by forests in addressing climate change and biodiversity conservation issues, additional efforts are required in supporting afforestation and forest ecosystem management in parallel with the continuation of these forms of support. In order to increase the attractiveness of measure 15, it is recommended to improve access to information for applicants and to simplify selection and management procedures. In addition, it is recommended that the specific working group for the coordination of measures targeting the forestry sector, involving competent authorities in the field, such as PAIA, forest rangers and members of forestry associations, be maintained in order to discuss on how to improve access conditions, information to beneficiaries and cooperation between stakeholders in implementing the interventions; It is also recommended to maintain the actions of involving the working group in coordinating the measures throughout the period of their implementation and that the Managing Authority continues monitoring the way in which the proposals / recommendations suggested by the working group are effectively taken into account when implementing the measures.

How to enhance the contribution from PNDR to soil and water quality management?

Conclusions related to soil

- The environmental services provided by soil are key in agriculture. The negative trends observed in soil erosion over the period 2010-2016 demonstrates the need for a higher contribution from CAP policy in this area.
- M10, through package 4, is already promoting agriculture practices with the objective of soil conservation.

Recommendations:

- Efforts need to be increased through for example package 4 and measures under M08 and M15 in forestry. For example a major financial effort could be made with M10 package 4, considering the commitments taken covering practices promoted by agriculture conservation.
- It is recommended to continue and maintain the possibilities of combining P4, M10 with M13, in areas with specific soil erosion problems.
- An increased attention is recommended (through the use of a predefined plan) to measure 13, with regard to soil management, to ensure that beneficiaries have adopted conservation principles, including minimum mechanical soil work, permanent soil organic cover and crop diversification.

Conclusions related to water:

- The use of pesticides is banished in M11 and regulated in some packages under M10.

Recommendations:

- In order to further prevent nitrate pollution, it is recommended that measures / packages be promoted towards areas with a high level of nitrate water pollution that promote specific requirements to limit the use of nitrate fertilizers. Specific commitments should be tailored based on good practices in terms of pesticide/fertilizer uses, soil coverage and manure management.

How to enhance the contribution from NRDP to climate change adaptation and mitigation?

Conclusions

- Potential contribution from the forestry sector to climate change adaptation and mitigation is high. However, sM 8.1 proved to be an unattractive measure for potential beneficiaries. M08 and M15 met issues in their launching phases, which explained delays (M15) and the low level of implementation reached (M08) to date. Interventions need to be implemented in a more effective way.

Recommendations

- Most of the beneficiaries of ECMs declared enduring damages from climate change, especially in terms of losses in crop yields and damages to infrastructures. Adaptative actions through specific commitments need to be improved in terms of crops diversification, reducing soil erosion (through minimum tillage for example), soil and water management. Some of them are already in place, but they are not accessed.
- In general, what *adaptation to climate change* means need to be clarified in the NRDP; through the definition of the relevant risks to be addressed (e.g. desertification, floods, forest fires, droughts, heat waves or pest control) and the objectives in terms of soil quality, water efficiency to be reached based on the identification of best practices (e.g. permanent pasture etc.) and a screening of the most relevant commitments to apply (in table below a first evaluation of the effects of commitments to the climate change adaptation and mitigation is provided)

How to enhance the contribution from NRDP to sustainable development?

Conclusions

- In general, ECMs, in addition to the environmental benefits they provide, contribute to avoid land abandonment and support socio-economic activities in rural areas. ECMs, especially M13, are sources of financial resources to sustain rural incomes and to provide the basis for ~~a~~ long- term rural development.

Recommendations

- There is a link between ECMs and sustainable development objectives in rural areas. However, the connection is not explicit in the programme documentation. The logic of NRDP interventions should be reinforced to achieve sustainability goals. This can be done in the next programming period based on improving the consistency of NRDP measures with the objectives and indicators defined in the RSDS;

The matrices presented below illustrate the extent to which each condition imposed on potential beneficiaries (eligibility, baseline, specific), provided by the NRDP 2014-2020, is adapted to the

environmental objectives associated with each area of intervention. The analysis is broken down at the level of measure / sub-measure / package / variant.

The evaluators assigned a score (low, medium, high) on the degree to which each condition is adapted to the objective of the analyzed commitment, while providing recommendations or alternatives in those situations where the conditions are not highly relevant in achieving the environmental objectives. If a certain criterion is not relevant for a certain environmental objective, a score was not given, considering that it is not applicable (N.A.).

Based on the analysis done at package-level, the evaluation team centralized all the information collected and highlighted the relevance of agri-environment and climate commitments (at measure level) in relation to each specific environmental objective.

Measure 10 - Agri-environment and climate

Sub-measure 10.1 – Payments for commitments regarding agri-environment and climate

Package 1 - Pastures with high natural value

Direct contribution

FA 4A - Restoration, conservation and development of biodiversity, including Natura 2000 areas and areas facing natural or other specific constraints, agricultural activities of high natural value as well as the state of European landscapes.

Indirect contribution

FA 4B – Improving water management, including fertilizer and pesticide management

Indirect contribution

FA 5D - Reduction of greenhouse gas and ammonia emissions from agriculture

Criteria	**Degree of adaptation to environmental objectives**			**Recommendations/alternatives to improve commitment**
	DI 4A	**DI 4B**	**DI 5D**	
Eligible area				
Package 1 – High Nature Value Agricultural Land covers agricultural land located in areas of high natural value, delimited in the Programme at the level of administrative-territorial unit (ATU) LAU2, used as permanent meadows, as well as areas covered with traditional orchards used extensively as meadows by mowing and/or grazing	High	N.A.	Average	It is recommended to maintain the criterion.
the commitments under Package 1 shall apply at agricultural parcel level and there is no possibility of changing parcels during the commitment period.	N.A.	N.A.	N.A.	It is recommended to maintain the criterion.
Beneficiary				
is the user of an agricultural area located on the territory of Romania, identifiable in the Integrated Administration and Control System (IACS), located in eligible areas and having a category of eligible use	N.A.	N.A.	N.A.	It is recommended to maintain the criterion.

EVALUAREA ON-GOING A PNDR 2014-2020 ÎN PERIOADA 2017-2020

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
has a minimum farm area of 1 ha and eligible parcels have a minimum size of 0,3 ha	Low	Low	Low	The criterion has a high contribution to environmental objectives. It is recommended to maintain the criterion.
undertake to maintain the agri-environmental commitment for a period of at least 5 years from the date of its signature	High	High	High	It is recommended to maintain the criterion.
undertake to comply with the relevant basic requirements and requirements specific to the agri-environmental packages for which they apply	High	High	High	It is recommended to maintain the criterion.
undertakes to keep a record of agricultural activities linked to the implementation of agri-environmental requirements (basic and specific to areas under commitment)	Low	Low	Low	The criterion has a high contribution to environmental objectives. It is recommended to maintain the criterion.
Specific conditions				
the use of chemical fertilizers and pesticides is prohibited (P)	High	High	High	Limiting the use of chemical inputs contributes to all environmental objectives covered by the package. It is recommended to maintain the criterion.
the traditional use of manure is permitted up to a maximum equivalent of 40 kg N s.a./ha (1 UVM/ha)	Average	Average	Average	Reducing the use of organic fertilizers contributes in the medium and long term to the conservation of biodiversity and to reducing GHG and ammonia emissions from agriculture. It is recommended to maintain the criterion.
mowing can only start after 1 July (for land located in the ATU with average altitudes	High	N.A.	N.A.	Setting periods when agricultural activities are not allowed, or areas where such activities are limited, contribute in the medium and long term to the conservation of biodiversity.

EVALUAREA ON-GOING A PNDR 2014-2020 ÎN PERIOADA 2017-2020

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
600 m or more) or after 15 June (for land located in the ATU with altitudes averages less than 600 m) (P)				It is recommended to maintain the criterion.
grazing is carried out with a maximum of 1 UVM per hectare	High	High	N.A.	Limiting the number of animals helps to preserve biodiversity and water quality. It is recommended to maintain the criterion.
the mowed vegetable mass shall be collected from the grassland under commitment no later than two weeks after mowing	High	N.A.	Low	The setting of mowing periods contributes to the preservation of biodiversity. However, by incorporating the plant mass into the soil for a longer period of time, contributions would be made to reduce GHG emissions. It is recommended to maintain the criterion.
the flooded meadows will not be grazed before two weeks after water withdrawal	High	High	N.A.	The criterion supports the environmental objectives of this package to an average extent.
no surface sowings or overseeds (sowings of species may be made from local flora only when some surfaces are accidentally affected)	High	N.A.	N.A.	It is recommended to maintain the criterion.
plowing or discussing grasslands on farms with ongoing commitments shall be prohibited	High	High	High	Encouraging agricultural practices based on manual work and avoiding the use of mechanized machinery contributes to reducing greenhouse gas and ammonia emissions from agriculture. It is recommended to maintain the criterion.
beneficiaries keep a record of agricultural activities related to the implementation of agri-environmental requirements	High	High	High	The criterion has a high contribution to environmental objectives. It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
the beneficiaries of the measure will have to prove that they have the necessary competences to implement commitments or undertakes to obtain the necessary knowledge and information or to ensure expertise needed in the area of implementation of agri-environment and climate commitments through counseling services, covering at least aspects relating to the identification of parcels agricultural, completion and submission of commitments and payment applications, management measures applicable at farm level necessary to comply with the basic requirements and specific requirements of commitments	High	High	High	The criterion is relevant for environmental objectives in terms of possessing the skills needed to comply with agro-environmental requirements (eco-conditionality). It is recommended to maintain the criterion.

Measure 10 – Agri-environment and climate

Sub-measure 10.1 – Payments for agri-environment and climate commitments

Package 2 – Traditional agricultural practices

- version 2.1 – manual works on permanent grasslands used as meadows
- version 2.2 – works with light machinery on permanent grasslands used as meadows

Direct contribution

FA 4A – Restoration, conservation and development of biodiversity, including in Natura 2000 areas, in areas facing natural or other specific constraints and in farming activities of high natural value, and the state of European landscapes

Indirect contribution

FA 5D – Reduction of greenhouse gas and ammonia emissions from agriculture

EVALUAREA ON-GOING A PNDR 2014-2020 ÎN PERIOADA 2017-2020

Criteria	Degree of adaptation to environmental objectives		Recommendations/alternatives to improve commitment
	DI 4A	DI 5D	
Eligible area			
Package 2 – Traditional agricultural practices covers agricultural land located in high natural value areas, delimited in the Programme at UAT LAU2 level, in the use category permanent grasslands used by mowing (feats), as well as areas covered with traditional orchards extensively used as mowing hay (variants 2.1 and 2.2).	High	Average	It is recommended to maintain the criterion.
commitments under both variants of Package 2 apply at the level of agricultural parcels and there is no possibility of changing parcels during the commitment period.	N.A.	N.A.	It is recommended to maintain the criterion.
Package 2 applies only in addition to a commitment entered into for Package 1.	High	High	It is recommended to maintain the criterion.
Beneficiary			
is the user of an agricultural area located on the territory of Romania, identifiable in the system Integrated Administration and Control (IACS) located in eligible areas and having an eligible use category	N.A.	N.A.	It is recommended to maintain the criterion.
has a minimum farm area of 1 ha and eligible parcels have a minimum size of 0,3 ha	High	High	The criterion has a high contribution to environmental objectives. It is recommended to maintain the criterion.
undertake to maintain the agri-environmental commitment for a period of at least 5 years from the date of its signature	High	High	It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives		Recommendations/alternatives to improve commitment
	DI 4A	DI 5D	
undertake to comply with the relevant basic requirements and requirements specific to the agri-environmental packages for which they apply	High	High	It is recommended to maintain the criterion.
undertakes to keep a record of agricultural activities linked to the implementation of agri-environmental requirements (basic and specific to areas under commitment)	High	High	The criterion has a high contribution to environmental objectives. It is recommended to maintain the criterion.
Specific conditions			
Package 2 – Variant 2.1 work with mechanized machinery shall not be permitted on the surface of traditional grasslands and orchards under commitment except those operated with animal force (P)	High	High	Encouraging agricultural practices based on manual works and avoiding the use of mechanized machinery contributes both to preserving biodiversity and reducing GHG and ammonia emissions from agriculture. It is recommended to maintain the criterion.
Package 2 – Variant 2.2 mowing can be done with low-capacity mechanized machinery (short blade and low driving speed) and the use of heavy machinery (P) is prohibited.	High	Average	Encouraging agricultural practices based on manual works and avoiding the use of mechanized machinery contributes both to preserving biodiversity and reducing GHG and ammonia emissions from agriculture. It is recommended to maintain the criterion.
the mowed vegetable mass shall be collected from the grassland under commitment no later than two weeks after mowing	High	Low	The setting of mowing periods contributes to the preservation of biodiversity. However, by incorporating the plant mass into the soil for a longer period of time, contributions would be made to reduce GHG emissions. It is recommended to maintain the criterion.

EVALUAREA ON-GOING A PNDR 2014-2020 ÎN PERIOADA 2017-2020

Criteria	Degree of adaptation to environmental objectives		Recommendations/alternatives to improve commitment
	DI 4A	DI 5D	
no surface sowings or overseeds (sowings of species may be made) from local flora only when some surfaces are accidentally affected)	High	N.A.	It is recommended to maintain the criterion.
plowing or discussing grasslands on farms with ongoing commitments shall be prohibited	High	High	Encouraging agricultural practices based on manual work and avoiding the use of mechanized machinery contributes to reducing greenhouse gas and ammonia emissions from agriculture. It is recommended to maintain the criterion.
beneficiaries keep a record of agricultural activities related to the implementation of agri-environmental requirements	High	High	The criterion has a high contribution to environmental objectives. It is recommended to maintain the criterion.
the beneficiaries of the measure will have to prove that they have the necessary competences to implement commitments or undertakes to obtain the necessary knowledge and information or to ensure expertise needed in the area of implementation of agri-environment and climate commitments through services advice or advice, covering at least aspects relating to the identification of parcels agricultural, completion and submission of commitments and payment applications, management measures applicable at farm level necessary to comply with the basic requirements and specific requirements of commitments	High	High	The criterion is relevant for environmental objectives in terms of possessing the skills needed to comply with agro-environmental requirements (eco-conditionality). It is recommended to maintain the criterion.

Measure 10 – Agri-environment and climate

Sub-measure 10.1 – Payments for agri-environment and climate commitments

Package 3 – Important meadows for birds

sub-package 3.1 – Crex crex

version 3.1.1 – manual works on meadows important for Crex crex

version 3.1.2 – works with light machinery on meadows important for Crex crex

sub-package 3.2 – Lanius minor and Falco vespertinus

version 3.2.1 – manual works on meadows important for Lanius minor and Falco vespertinus

version 3.2.2 – works with light machinery on meadows important for Lanius minor and Falco vespertinus

Direct contribution

FA 4A – Restoration, conservation and development of biodiversity, including in Natura 2000 areas, in areas facing natural or other specific constraints and in farming activities of high natural value, and the state of European landscapes

Indirect contribution

FA 4B – Improving water management, including fertilizer and pesticide management

Indirect contribution

FA 5D – Reduction of greenhouse gas and ammonia emissions from agriculture

Criteria	**Degree of adaptation to environmental objectives**			**Recommendations/alternatives to improve commitment**
	DI 4A	**DI 4B**	**DI 5D**	
Eligible area				
Package 3 – Important meadows for birds targeting agricultural land used as meadows permanent, located in the areas delimited in the Programme at UAT LAU2 level	High	N.A.	Average	It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
commitments under Package 3 apply at agricultural parcel level and there is no possibility the change of parcels during the commitment period.	High	High	High	It is recommended to maintain the criterion.
Beneficiary				
is the user of an agricultural area located on the territory of Romania, identifiable in the Integrated Administration and Control System (IACS), located in eligible areas and having a category of eligible use	N.A.	N.A.	N.A.	It is recommended to maintain the criterion.
has a minimum farm area of 1 ha and eligible parcels have a minimum size of 0,3 ha	High	High	High	The criterion has a high contribution to environmental objectives. It is recommended to maintain the criterion.
undertake to maintain the agri-environmental commitment for a period of at least 5 years from the date of its signature	High	High	High	It is recommended to maintain the criterion.
undertake to comply with the relevant basic requirements and requirements specific to the agri-environmental packages for which they apply	High	High	High	It is recommended to maintain the criterion.
undertakes to keep a record of agricultural activities linked to the implementation of agri-environmental requirements (basic and specific to areas under commitment)	High	High	High	The criterion has a high contribution to environmental objectives. It is recommended to maintain the criterion.
Specific conditions of commitments – sub-package 3.1 – Crex crex				

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Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
Mowing can only be done after 31 July (P)	High	N.A.	N.A.	Establishing periods when agricultural activities are not allowed, or areas where such activities are limited, contribute in the medium and long term to the conservation of biodiversity and the maintenance of bird habitats. It is recommended to maintain the criterion.
mowing will be made from inside the parcel to the outside of the plot	High	N.A.	N.A.	The criterion is very specific, but relevant for biodiversity, as birds have the opportunity to leave the plot when farmers work. It is recommended to maintain the criterion.
grazing shall be carried out with a maximum of 0,7 UVM per hectare	High	High	N.A.	Limiting the number of animals contributes to preserving biodiversity and water quality It is recommended to maintain the criterion.
mechanized machinery shall not be allowed on the surface of under-committed meadows, with except those operated with animal force (for version 3.1.1) or work may be carried out with mechanized machines of small capacity (machine with machines with short blade and low displacement speed),	High	High	High/Environment	Encouraging agricultural practices based on manual works and avoiding the use of mechanized machinery contributes both to preserving biodiversity and reducing GHG and ammonia emissions from agriculture. It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
being prohibited from heavy machinery (for version 3.1.2) (P)				
actions leading to acceleration of natural drainage of grasslands under shall be prohibited commitment	High	High	N.A.	The criterion is relevant from the point of view of maintaining biodiversity and water management. It is recommended to maintain the criterion
Specific conditions for commitments – sub-package 3.2 – Lanius minor and Falco vespertinus				
mowing must be carried out by 1 July at the latest	High	N.A.	N.A.	Establishing periods when agricultural activities are not allowed, or areas where such activities are limited, contribute in the medium and long term to preserve biodiversity and maintain habitat for the species. It is recommended to maintain the criterion.
grazing will be performed with a maximum of 1 UVM per hectare	High	High	N.A.	Limiting the number of animals contributes to preserving biodiversity and water quality It is recommended to maintain the criterion.
work with mechanized machinery shall not be permitted on grasslands under commitment to except those operated with animal force (for version 3.2.1) or work can be performed with machines	High	High	High/ Average	Encouraging agricultural practices based on manual works and avoiding the use of mechanised machinery contributes both to preserving biodiversity and reducing

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
mechanized low capacity (machine with machines with short blade and low displacement speed), being prohibited use of heavy machinery (for version 3.2.2) (P)				GHG and ammonia emissions from agriculture. It is recommended to maintain the criterion.
Specific conditions for commitments – common for sub-packages 3.1 and 3.2				
the use of chemical fertilizers and pesticides is prohibited (P)	High	High	High	Limiting the use of chemical inputs contributes to all environmental objectives covered by the package. It is recommended to maintain the criterion.
the traditional use of manure is allowed up to a maximum equivalent of 40 kg N sa/ha (1 UVM/ha)	High	Average	Average	Reducing the use of organic fertilizers contributes in the medium and long term to the conservation of biodiversity and to reducing GHG and ammonia emissions from agriculture. It is recommended to maintain the criterion.
a tape, 3 meters wide, will be left on the edges of each plot (can be mowed after the date on 1 September)	High	N.A.	N.A.	The criterion is very specific, but relevant for biodiversity, as birds have the opportunity to leave the plot when farmers work. It is recommended to maintain the criterion.
the mowed vegetable mass shall be collected from the grassland under commitment no later than two weeks after mowing	High	N.A.	Low	The setting of mowing periods contributes to the preservation of biodiversity. However, by incorporating the plant mass

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
				into the soil for a longer period of time, contributions would be made to reduce GHG emissions. It is recommended to maintain the criterion.
the flooded meadows will not be grazed before two weeks after water withdrawal	High	High	N.A.	The criterion supports the environmental objectives of this package to an high extent. It is recommended to maintain the criterion.
no surface sowings or overrseeds (sowings of species may be made from local flora only when some surfaces are accidentally affected)	High	N.A.	N.A.	It is recommended to maintain the criterion.
it is prohibited to plough or discuss grasslands existing on farms with commitments in scrolling	High	High	High	Encouraging agricultural practices based on manual work and avoiding the use of mechanized machinery contributes to reducing greenhouse gas and ammonia emissions from agriculture. It is recommended to maintain the criterion.
beneficiaries keep a record of agricultural activities related to the implementation of agri-environmental requirements	High	High	High	The criterion's contribution to environmental aspects is very significant. It is recommended to maintain the criterion
the beneficiaries of the measure will have to prove that they have the necessary competences to implement	High	High	High	The criterion is relevant for environmental objectives in terms of possessing the skills

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
commitments or undertakes to obtain the necessary knowledge and information or to ensure expertise needed in the area of implementation of agri-environment and climate commitments through services advice or advice, covering at least aspects relating to the identification of parcels agricultural, completion and submission of commitments and payment applications, management measures applicable at farm level necessary to comply with the basic requirements and specific requirements of commitments				needed to comply with agro-environmental requirements (eco-conditionality). It is recommended to maintain the criterion.

Measure 10 – Agri-environment and climate

Sub-measure 10.1 – Payments for agri-environment and climate commitments

Package 4 – Green cultures

Direct contribution

FA 4C — *Prevention of soil erosion and improvement of soil management*

Indirect contribution

FA 4B – Improving water management, including fertilizer and Pesticide management

Indirect contribution

FA 5D – Reduction of greenhouse gas and ammonia emissions from agriculture

Indirect contribution

FA 5E – Promoting the conservation and sequestration of carbon in agriculture and forestry

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Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	DI 4C	DI 4B	DI 5D	DI 5E	
Eligible area					
Package 4 – Green crops is available for arable land located throughout the national territory.	High	High	Average	High	It is recommended to maintain the criterion.
in order to avoid any overlap with the cross-compliance standard for soil protection in winter, Package 4 may be applied to a maximum of 80 % of the farm's arable land area.	High	N.A.	N.A.	N.A.	The condition is proposed in the context of avoiding duplication of the requirements of Package 4 with GAEC4 on winter soil protection by ensuring coverage agricultural land or maintaining unarmed land on at least 20 % of the farm's arable land area and thus avoiding double funding. It is recommended to maintain the criterion.
the commitments entered into for Package 4 are conditional on the maintenance of the value of the area on the entire commitment period, the parcels to which the requirements apply may be changed from one year to the next.	Average	Average	Average	Average	Maintaining the value of areas throughout the commitment period contributes to the achievement of all environmental objectives. It is recommended to maintain the criterion.
Beneficiary					
is the user of an agricultural area located on the territory of Romania, identifiable in the Integrated Administration and Control System (IACS) and having an eligible use category	N.A.	N.A.	N.A.	N.A.	It is recommended to maintain the criterion.
has a minimum farm area of 1 ha and eligible parcels have a minimum size of 0,3 ha	High	High	High	High	The impact of the criterion on environmental aspects is insignificant. The contribution of the

Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	DI 4C	DI 4B	DI 5D	DI 5E	
					criterion to the environmental objectives could only be improved if the commitment was required to be made over a larger area. However, no changes are required to the criterion.
undertake to maintain the agri-environmental commitment for a period of at least 5 years from date of signature	High	High	High	High	It is recommended to maintain the criterion.
undertake to comply with the relevant basic requirements and requirements specific to agri-environmental packages for which they apply	High	High	High	High	It is recommended to maintain the criterion.
undertakes to keep a record of agricultural activities linked to the implementation of agri-environmental requirements (basic and specific to areas under commitment)	High	High	High	High	The criterion has a high contribution to environmental objectives. The criterion's contribution to environmental aspects is insignificant.
Specific conditions					
the sowing of green crops shall be carried out by 30 September using: the peas, vetch, colza, mustard, lupin, sulphide (P)	High	High	High	High	The criterion is consistent with the conditions regarding the cultivation and rotation of green crops and relevant from the point of view of all environmental objectives. It is recommended to maintain the criterion.
the use of chemical fertilizers is prohibited and only organic fertilizers can be used before the Establishment of Green Cultures	High	High	Average	N.A.	Limiting the use of chemical inputs during the maintenance of commitments contributes to all environmental objectives covered by the package. It is recommended to maintain the criterion.

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Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	DI 4C	DI 4B	DI 5D	DI 5E	
biomass formed shall be incorporated into the soil no later than 31 March (P)	High	High	High	High	Setting the length of time to which activities can be undertaken contributes to the achievement of all environmental objectives. Biomass incorporated in soil directly supports GHG emission management and carbon sequestration. It is recommended to maintain the criterion.
plowing or discussing grasslands on farms with ongoing commitments shall be prohibited	High	High	High	High	Encouraging agricultural practices based on manual work and avoiding the use of mechanized machinery contributes to reducing greenhouse gas and ammonia emissions from agriculture and carbon sequestration. It is recommended to maintain the criterion
beneficiaries keep a record of agricultural activities related to the implementation of agri-environmental requirements	High	High	High	High	The criterion's contribution to environmental aspects is very significant. It is recommended to maintain the criterion.
the beneficiaries of the measure will have to prove that they have the necessary competences to implement commitments or undertakes to obtain the necessary knowledge and information or to ensure expertise needed in the area of implementation of agri-environment and climate commitments through services advice or advice, covering at least aspects relating to the identification of parcels agricultural, completion and submission of commitments and payment applications,	High	High	High	High	The criterion is relevant for environmental objectives in terms of possessing the skills needed to comply with agri-environmental requirements (eco-conditionality). It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	DI 4C	DI 4B	DI 5D	DI 5E	
management measures applicable at farm level necessary to comply with the basic requirements and specific requirements of commitments					

Measure 10 – Agri-environment and climate

Sub-measure 10.1 – Payments for agri-environment and climate commitments

Package 5 – Adaptation to the effects of climate change

Direct contribution

FA 5A — *Efficiency of water use in agriculture*

Indirect contribution

FA 4C — *Prevention of soil erosion and improvement of soil management*

Indirect contribution

FA 5D – Reduction of greenhouse gas and ammonia emissions from agriculture

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 5A	DI 4C	DI 5D	
Eligible area				
Package 5 – Adaptation to the effects of climate change concerns arable land located in areas at increased risk of desertification, delimited in the Program at the level of UAT LAU2.	High	Average	Average	It is recommended to maintain the criterion.
the commitments entered into for Package 5 are conditional on the maintenance of the value of the area	Low	Low	Low	Maintaining the value of areas throughout the commitment period contributes to the

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 5A	DI 4C	DI 5D	
on the entire commitment period, the parcels to which the requirements apply can be changed from one year to another one.				achievement of all environmental objectives. However, the principle of modifying parcels from year to year significantly reduces the impact of intervention as they aim to maintain commitments for a period of at least 5 years.
only farmers holding on the farm less than 10 ha are eligible	N.A.	N.A.	N.A.	It is recommended to maintain the criterion, as this is relevant from the perspective of avoiding double funding.
Beneficiary				
is the user of an agricultural area located on the territory of Romania, identifiable in the system Integrated Administration and Control (IACS) located in eligible areas and having an eligible use category	N.A.	N.A.	N.A.	
has a minimum farm area of 1 ha and eligible parcels have a minimum size of 0,3 ha	High	High	High	The impact of the criterion on environmental aspects is significant. It is recommended to maintain the criterion.
undertake to maintain the agri-environmental commitment for a period of at least 5 years from date of signature	High	High	High	It is recommended to maintain the criterion.
undertake to comply with the relevant basic requirements and requirements specific to agri-environmental packages for which they apply	High	High	High	It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 5A	DI 4C	DI 5D	
undertakes to keep a record of agricultural activities linked to the implementation of agri-environmental requirements (basic and specific to areas under commitment)	High	High	High	The criterion's contribution to environmental aspects is significant.
Specific conditions				
for each spring crop (corn, sorghum, sunflower, soybean) employed on the surface cultivated at the same time, at least 2 hybrids/soils with different precocities should be used in equal proportions. (times or semi-times and semi-late or late) (P)	High	High	High	The condition imposed is an option for mitigating the effects of climate change in areas with desertification potential, because by cultivating hybrids/shoulds with different precocities farmers are protected from excess climate and can gain experience to alter their behavior if climate change predictions manifest. It is recommended to maintain the criterion.
farmers who make commitments will have to ensure crop rotation, so in 2 years consecutive to use at least 3 different crops out of the 4 eligible (corn, sorghum, sunflower, soybean)	High	High	High	It is recommended to maintain the criterion.
the use of minimum tillage methods is forbidden to plow surfaces employed (P)	High	High	High	The application of minimum soil work contributes directly to carbon sequestration and soil water conservation. It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 5A	DI 4C	DI 5D	
application of manure in composted form (maximum amount of manure to be applied on the ground must be in line with the Standards on maximum quantities of nitrogen fertilizers that can be applied to the agricultural land defined in the Code of Good Agricultural Practice for the Protection of Waters against Pollution by Nitrates (P)	Average	Average	High	Reducing fertilizer use contributes in the medium to long term to reduce GHG and ammonia emissions from agriculture. It is recommended to maintain the criterion.
it is prohibited to plough or discuss grasslands existing on farms with commitments in scrolling	Low	High	High	Encouraging agricultural practices based on manual work and avoiding the use of mechanized machinery contributes to reducing greenhouse gas and ammonia emissions from agriculture. It is recommended to maintain the criterion
beneficiaries keep a record of agricultural activities related to the implementation of agri-environmental requirements	High	High	High	The criterion's contribution to environmental aspects is significant. It is recommended to maintain the criterion
the beneficiaries of the measure will have to prove that they have the necessary competences to implement commitments or undertakes to obtain the necessary knowledge and information or to ensure expertise needed in the area of implementation of agri-environment and climate commitments through services advice or advice, covering at least aspects relating to the identification of parcels agricultural, completion and submission of commitments and payment applications, management measures applicable at farm level	High	High	High	The criterion is relevant for environmental objectives in terms of possessing the skills needed to comply with agri-environmental requirements (eco-conditionality). It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 5A	DI 4C	DI 5D	
necessary to comply with the basic requirements and specific requirements of commitments.				

Measure 10 – Agri-environment and climate

Sub-measure 10.1 – Payments for agri-environment and climate commitments

Package 6 – important grasslands for butterflies (Maculinea sp.)

- version 6.1 – manual works on meadows important for butterflies (Maculinea sp.)
- version 6.2 – works with light machinery on meadows important for butterflies (Maculinea sp.)

Direct contribution

FA 4A – Restoration, conservation and development of biodiversity, including in Natura 2000 areas, in areas facing natural or other specific constraints and in farming activities of high natural value, and the state of European landscapes

Indirect contribution

FA 4B – Improving water management, including fertilizer and pesticide management

Indirect contribution

FA 5D – Reduction of greenhouse gas and ammonia emissions from agriculture

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
Eligible area				
Package 6 – important grasslands for butterflies (Maculinea sp.) covers agricultural land used as permanent grasslands located in areas where representative species populations have been identified priority of butterflies of the genus	High	N.A.	Average	It is recommended to maintain the criterion.

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Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
Maculinea sp., delimited in the Program at UAT LAU2 level				
commitments under Package 6 apply at agricultural parcel level and there is no possibility the change of parcels during the commitment period.	High	N.A.	N.A.	It is recommended to maintain the criterion.
Beneficiary				
is the user of an agricultural area located on the territory of Romania, identifiable in the Integrated Administration and Control System (IACS), located in eligible areas and having an eligible use category	N.A.	N.A.	N.A.	It is recommended to maintain the criterion.
has a minimum farm area of 1 ha and eligible parcels have a minimum size of 0,3 ha	High	High	High	The impact of the criterion on environmental aspects is significant. It is recommended to maintain the criterion.
undertake to maintain the agri-environmental commitment for a period of at least 5 years from the date of its signature	High	High	High	It is recommended to maintain the criterion.
undertake to comply with the relevant basic requirements and requirements specific to the agri-environmental packages for which they apply	High	High	High	It is recommended to maintain the criterion.
undertakes to keep a record of agricultural activities linked to the implementation of agri-environmental requirements (basic and specific to areas under commitment)	High	High	High	The criterion's contribution to environmental aspects is significant.

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Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
Specific conditions				
the use of chemical fertilizers and pesticides is prohibited (P)	High	High	High	Limiting the use of chemical inputs contributes to all environmental objectives covered by the package. It is recommended to maintain the criterion.
the traditional use of manure is permitted up to a maximum equivalent of 40 kg N s.a./ha (1 UVM/ha)	High	Average	Average	Reducing the use of organic fertilizers contributes in the medium and long term to the conservation of biodiversity and to reducing GHG and ammonia emissions from agriculture. It is recommended to maintain the criterion.
mowing can only begin after August 25 (P)	High	N.A.	N.A.	Setting periods when agricultural activities are not allowed, or areas where such activities are limited, contribute in the medium and long term to the conservation of biodiversity. It is recommended to maintain the criterion.
mechanized machinery is not permitted on the surface of under commitment meadows, except those operated with animal force (for variant 6.1) or work may be carried out with mechanized machines of small capacity (machine with machines with short blade and low speed of travel), being prohibited the use of heavy machinery (for variant 6.2) (P)	High	High	High/Average	Encouraging agricultural practices based on manual works and avoiding the use of mechanized machinery contributes both to preserving biodiversity and reducing GHG and ammonia emissions from agriculture. It is recommended to maintain the criterion.
Grazing is carried out with a maximum of 0,7 UVM per hectare	High	High	N.A.	Limiting the number of animals contributes to preserving biodiversity and water quality It is recommended to maintain the criterion.

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Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
actions leading to acceleration of the natural drainage of grasslands under commitment are prohibited	High	High	N.A.	
the mowed vegetable mass shall be collected from the grassland under commitment no later than two weeks after mowing	High	N.A.	Low	The setting of mowing periods contributes to the preservation of biodiversity. However, by incorporating the plant mass into the soil for a longer period of time, contributions would be made to reduce GHG emissions. It is recommended to maintain the criterion.
the flooded meadows will not be grazed before two weeks after water withdrawal	High	High	N.A.	The criterion supports the environmental objectives of this package to an average extent. It is recommended to maintain the criterion.
no surface sowings or overseeds (sowings of local flora species may be made only in cases where some areas are accidentally affected)	High	N.A.	N.A.	It is recommended to maintain the criterion.
plowing or discussing grasslands on farms with ongoing commitments shall be prohibited	High	High	High	Encouraging agricultural practices based on manual work and avoiding the use of mechanized machinery contributes to reducing greenhouse gas and ammonia emissions from agriculture. It is recommended to maintain the criterion.
beneficiaries keep a record of agricultural activities related to the implementation of agri-environmental requirements	High	High	High	The criterion's contribution to environmental aspects is significant. It is recommended to maintain the criterion.
the beneficiaries of the measure will have to prove that they have the necessary competences to implement commitments or undertakes to obtain the necessary knowledge and information	High	High	High	The criterion is relevant for environmental objectives in terms of possessing the skills needed to comply with agro-environmental requirements (eco-conditionality).

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
or to ensure expertise needed in the area of implementation of agri-environment and climate commitments through services advice or advice, covering at least aspects relating to the identification of agricultural parcels, the completion and submission of commitments and payment applications, the management measures applicable at farm level necessary to comply with the basic requirements and specific requirements of commitments				It is recommended to maintain the criterion.

Measure 10 – Agri-environment and climate

Sub-measure 10.1 – Payments for agri-environment and climate commitments

Package 7 – Important arable land as feeding areas for red-necked goose (Branta ruficollis)

Direct contribution

FA 4A – Restoration, conservation and development of biodiversity, including in Natura 2000 areas, in areas facing natural or other specific constraints and in farming activities of high natural value, and the state of European landscapes

Indirect contribution

FA 4B – Improving water management, including fertilizer and pesticide management

Criteria	Degree of adaptation to environmental objectives		Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	
Eligible area			
Package 7 – Important arable land as feeding areas for the red-necked goose (Branta ruficollis) targets the arable lands located in SPAs (Special Protection	High	N.A.	It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives		Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	
Area) representative of Branta ruficollis, delimited in the Programme at LUU2 level.			
in order to avoid any overlap with the cross-compliance standard for soil protection in winter, Package 7 may be applied to a maximum of 80 % of the area of arable land belonging to a farm	N.A.	N.A.	The condition is proposed in the context of avoiding duplication of the requirements of Package 7 with the GAEC4 standard on winter soil protection by ensuring the coverage of agricultural land or keeping it unharmed on at least 20 % of the farm's arable land area and thus avoiding double funding. It is recommended to maintain the criterion.
commitments under Packages 7 apply at agricultural parcel level and there is no possibility of changing parcels during commitments	N.A.	N.A.	It is recommended to maintain the criterion.
Beneficiary			
is the user of an agricultural area located on the territory of Romania, identifiable in the Integrated Administration and Control System (IACS), located in eligible areas and having an eligible use category	N.A.	N.A.	It is recommended to maintain the criterion.
has a minimum farm area of 1 ha and eligible parcels have a minimum size of 0,3 ha	High	High	The impact of the criterion on environmental aspects is significant. It is recommended to maintain the criterion.
undertake to maintain the agri-environmental commitment for a period of at least 5 years from the date of its signature	High	High	It is recommended to maintain the criterion.

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Criteria	Degree of adaptation to environmental objectives		Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	
undertake to comply with the relevant basic requirements and requirements specific to the agri-environmental packages for which they apply	High	High	It is recommended to maintain the criterion.
undertakes to keep a record of agricultural activities linked to the implementation of agri-environmental requirements (basic and specific to areas under commitment)	High	High	The criterion's contribution to environmental aspects is significant. It is recommended to maintain the criterion.
Specific conditions			
each year of commitment, after 15 September, a crop of autumn cereals (wheat, barley, rye, triticale) or rape (P) shall be established.	High	N.A.	The appearance of the first red-necked geese can be seen at the end of October (early November) on the territory of Romania. As autumn or rape cereal crops are the main source of food, the establishment of autumn cereal or rape crops after 15 September ensures the protection of the species. It is recommended to maintain the criterion.
the sowing of autumn cereals (wheat, barley, rye, triticale) or colza shall be completed before 15 October	High	N.A.	Given the period of appearance of red-necked geese in Romania, as well as their main food source, the sowing of autumn cereals and rape until October 15 (previous to the appearance of birds) ensures the protection of species. It is recommended to maintain the criterion.
during the 5-year period of commitments, it is mandatory to establish in at least 2 years the summer maize crop	High	N.A.	Maize also provides an even more nutritious intake for the red-necked goose, but the beans can only be found and consumed by geese at the beginning of winter.

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Criteria	Degree of adaptation to environmental objectives		Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	
			Moreover, corn is a good precursor to autumn cereal crops. It is recommended to maintain the criterion.
if a maize crop is established in that year on the parcel employed, the autumn crop shall be incorporated into the soil by the end of March at the latest (P)	High	N.A.	The criterion is consistent with the principle of setting up maize in summer. It is recommended to maintain the criterion
the plots employed may be sown with maize, but not later than 15 May, and the maize will not be harvested before 15 September	High	N.A.	The criterion is consistent with the principle of setting up maize in summer. It is recommended to maintain the criterion
when the maize crop is harvested, an unharvested area of 5 % or more but not more than 10 % (the crop is left standing or lying down) or where a maize crop is not established, in that commitment year the farmer shall be obliged to ensure a quantity of 100 kg of maize per hectare at least one feeding point situated on the area of each plot employed (P)	High	N.A.	Maize provides even more nutritious intake than autumn cereal crops for the red-necked goose. Moreover, feeding insurance at feeding points brings a major benefit to red-necked goose populations. It is recommended to maintain the criterion.
pesticides and phyto-stimulators (fertilizers) may not be used in the period between the sowing of autumn crop and 15th of March (P)	High	High	The criterion contributes to maintaining biodiversity, being aimed at avoiding the use of pesticides and phytostimulators while the red-necked gang is in Romania. Moreover, the criterion helps to improve water management. It is recommended to maintain the criterion.

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Criteria	Degree of adaptation to environmental objectives		Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	
Agricultural and/or grazing works shall be prohibited from 15th of October to 15th of March	High	N.A.	The criterion supports biodiversity to a high extent, as the period during which agricultural works are banned corresponds to the period during which the red-necked goose is located in Romania. It is recommended to maintain the criterion.
the use of bird-fighting methods shall be prohibited from 15th of October to 31th of March (P)	High	N.A.	The criterion supports biodiversity to a high extent, as the period during which bird-fighting methods are banned corresponds to the period during which the red-necked goose is located on Romanian territory. It is recommended to maintain the criterion.
plowing or discussing grasslands on farms with ongoing commitments shall be prohibited	High	Average	Encouraging agricultural practices based on manual work and avoiding the use of mechanized machinery contributes to reducing greenhouse gas and ammonia emissions from agriculture, thereby helping to maintain biodiversity. It is recommended to maintain the criterion
beneficiaries keep a record of agricultural activities related to the implementation of agri-environmental requirements	High	High	The criterion's contribution to environmental aspects is significant. It is recommended to maintain the criterion.
the beneficiaries of the measure will have to prove that they have the necessary competences to implement commitments or undertakes to obtain the necessary knowledge and information or to ensure expertise needed in the area of	High	High	The criterion is relevant for environmental objectives in terms of possessing the skills needed to comply with agri-environmental requirements (eco-conditionality).

Criteria	Degree of adaptation to environmental objectives		Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	
implementation of agri-environment and climate commitments through services advice or advice, covering at least aspects relating to the identification of parcels agricultural, completion and submission of commitments and payment applications, management measures applicable at farm level necessary to comply with the basic requirements and specific requirements of commitments			It is recommended to maintain the criterion.

Measure 10 – Agri-environment and climate

Sub-measure 10.1 – Raising farm animals of local breeds in danger of abandonment

Package 8 – Farming animals of local breeds in danger of abandonment

Direct contribution

FA 4A – Restoration, conservation and development of biodiversity, including in Natura 2000 areas, in areas facing natural or other specific constraints and in farming activities of high natural value, and the state of European landscapes

Criteria	Degree of adaptation to environmental objectives	Recommendations/alternatives to improve commitment
	FA 4A	
Eligible area		
Package 8 – Farming animals of local breeds in danger of abandonment is available throughout the national territory	High	It is recommended to maintain the criterion.
Beneficiary		

Criteria	Degree of adaptation to environmental objectives	Recommendations/alternatives to improve commitment
	FA 4A	
owns local pure-bred breeding females in danger of abandonment of species covered by the programme entered in the breeding book of the breed – Main Section	High	It is recommended to maintain the criterion.
undertake to maintain the agri-environmental commitment for a period of at least 5 years from the date of its signature	High	It is recommended to maintain the criterion.
undertake to comply with the relevant basic requirements and requirements specific to the agri-environmental packages for which they apply	High	It is recommended to maintain the criterion.
undertakes to keep a record of agricultural activities linked to the implementation of agri-environmental requirements (basic and specific to areas under commitment)	High	The criterion's contribution to biodiversity is significant. It is recommended to maintain the criterion.
Specific conditions		
the beneficiary undertakes to comply with the rules governing the organisation and functioning of the breeding book of the breed led by associations accredited by ANZ on the basis of Article 5 lett. a) of GD no. 1188/2014	High	Regulation on the organization and functioning of the herd-book recognized by ANZ includes provisions on maintaining the purity of the breed, as well as provisions on the obligations of breeders with regard to the minimum replacement rate of old females and the avoidance of inbreeding. In this context, the criterion is relevant to the biodiversity environmental objective. It is recommended to maintain the criterion.
the beneficiary undertakes to maintain, for a period of 5 years, the number of adult breeding animals foreseen at the conclusion of the commitment, as well as the female offspring required for the replacement of these animals by the end of the programme; if the employed population is reduced due to causes such as disease, slaughter, death or sale of animals, the beneficiary shall have the obligation to notify the Payments Agency and to restore the flock of adult breeding females, including	High	Maintaining the number of adult breeding females for a period of 5 years directly supports the maintenance of local breeds (biodiversity) It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives	Recommendations/alternatives to improve commitment
	FA 4A	
youth or purchase; if the adult animal population does not recover within 6 months of notification, the support will be reduced proportionately (P)		
beneficiaries keep a record of agricultural activities related to the implementation of agri-environmental requirements	High	The criterion's contribution to environmental aspects is significant.
the beneficiaries of the measure will have to provide evidence of the skills necessary for the implementation of the commitments or undertake to obtain the necessary knowledge and information or to provide the necessary expertise in the implementation of agri-environmental and climate commitments through advisory or advisory services, covering at least the aspects related to the identification of agricultural parcels, the completion and submission of commitments and payment applications, the management measures applicable at farm level necessary to comply with the basic requirements and specific requirements of commitments.	High	The criterion is relevant for environmental objectives in terms of possessing the skills needed to comply with agri-environmental requirements (eco-conditionality). It is recommended to maintain the criterion.

Measure 10 – Agri-environment and climate

Sub-measure 10.1 – Raising farm animals of local breeds in danger of abandonment

Package 9 – Important agricultural land as feeding areas for small printing eagle (Aquila pomarina):

sub-package 9.1 – important arable land as feeding areas for small type eagle (Aquila pomarina),

sub-package 9.2 – important permanent meadows as feeding areas for the small printing eagle (Aquila pomarina)

- version 9.2.1 – manual works on meadows important for small printing eagle (Aquila pomarina),
- version 9.2.2 – works with light machinery on meadows important for small printing eagle (Aquila pomarina).

Direct contribution

FA 4A – Restoration, conservation and development of biodiversity, including in Natura 2000 areas, in areas facing natural or other specific constraints and in farming activities of high natural value, and the state of European landscapes

Indirect contribution

FA 4B – Improving water management, including fertilizer and pesticide management

Indirect contribution

FA 5D – Reduction of greenhouse gas and ammonia emissions from agriculture

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	FA 4A	FA 4B	FA 5D	
Eligible area				
Package 9 – Important agricultural land as feeding areas for the small scream eagle (Aquila pomarina) covers agricultural land used as arable land (sub-package 9.1) but not eligible for P5 or P7 and agricultural land used as permanent grassland (sub-package 9.2) but not eligible for P1, P3 or P6, located in the areas delimited in the Programme at UAT LAU2 level.	High	N.A.	Average	It is recommended to maintain the criterion.
arable land eligible for sub-package 9.1 must not have been permanent grassland since 2018.	High	N.A.	N.A.	It is recommended to maintain the criterion.
the commitments under Package 9 shall apply at agricultural parcel level and there is no possibility of changing parcels during the commitment period.	N.A.	N.A.	N.A.	It is recommended to maintain the criterion.
Beneficiary				
is the user of an agricultural area located on the territory of Romania, identifiable in the Integrated Administration and Control System (IACS), located in eligible areas and having an eligible use category	N.A.	N.A.	N.A.	It is recommended to maintain the criterion.
has a minimum farm area of 1 ha and eligible parcels have a minimum size of 0,3 ha	High	High	High	The impact of the criterion on environmental aspects is significant. It is recommended to maintain the criterion.

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Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	FA 4A	FA 4B	FA 5D	
undertake to maintain the agri-environmental commitment for a period of at least 5 years from the date of its signature	High	High	High	It is recommended to maintain the criterion.
undertake to comply with the relevant basic requirements and requirements specific to the agri-environmental packages for which they apply	High	High	High	It is recommended to maintain the criterion.
undertakes to keep a record of agricultural activities linked to the implementation of agri-environmental requirements (basic and specific to areas under commitment)	High	High	High	The criterion's contribution to environmental aspects is significant. It is recommended to maintain the criterion.
Specific conditions – Sub-package 9.1 – important arable land as feeding areas for small printing eagle (Aquila pomarina)				
the cultivation of rape, maize and sunflower is prohibited (P)	High	N.A.	N.A.	Since they are tall plants, access to prey is prevented for the small scream eagle. It is recommended to maintain the criterion.
10 % of the area of each parcel under commitment will remain uncultivated (P); the uncultivated area shall be so located that the compact cultivated area does not exceed 4 ha and the minimum width of the bands to be set up for this purpose shall not be less than 3 m	High	N.A.	N.A.	The criterion is very specific, but relevant for biodiversity, as it maintains the natural feeding framework for birds and gives them the opportunity to leave the plot when farmers work. It is recommended to maintain the criterion.
10 % of the plot's area will remain unharvested and the crop will remain standing until the end February (P)	High	N.A.	N.A.	The criterion is justified for maintaining natural habitats (habitat islands) to ensure optimal food and nesting conditions. It is recommended to maintain the criterion.
Specific conditions – Sub-package 9.2 – important permanent meadows as feeding areas for the small printing eagle (Aquila pomarina)				

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	FA 4A	FA 4B	FA 5D	
mowing will be carried out from 1 July (P)	High	N.A.	N.A.	Setting periods when agricultural activities are not allowed, or areas where such activities are limited, contribute in the medium and long term to the conservation of biodiversity. It is recommended to maintain the criterion.
at least 10 % of the area of each parcel under the undertaking must be kept flat, with mowing allowed after the end of September (P)	High	N.A.	N.A.	Setting periods when agricultural activities are not allowed, or areas where such activities are limited, contribute in the medium and long term to the conservation of biodiversity. At the same time, the natural habitat (habitat islands) is maintained to ensure optimal food and nesting conditions. It is recommended to maintain the criterion.
work with mechanized machinery is not permitted on the area of grasslands under commitment except those operated with animal force (for version 9.2.1) or work can be performed with low capacity mechanized machinery (machine with short blade and low speed of travel), being prohibited the use of heavy machinery (for version 9.2.2) (P)	High	High	High/Average	Encouraging agricultural practices based on manual works and avoiding the use of mechanized machinery contributes both to preserving biodiversity and reducing GHG and ammonia emissions from agriculture. It is recommended to maintain the criterion.
the traditional use of manure is allowed up to a maximum equivalent of 40 kg N sa/ha (1 UVM/ha)	High	Average	Average	Reducing the use of organic fertilizers contributes in the medium and long term to the conservation of biodiversity and to reducing GHG and ammonia emissions from agriculture. It is recommended to maintain the criterion.
grazing is performed with maximum 0,7 UVM/ha	High	High	N.A.	Limiting the number of animals contributes to preserving biodiversity and water quality It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	FA 4A	FA 4B	FA 5D	
flooded pastures will not be grazed before two weeks after water withdrawal	High	High	N.A.	The criterion supports the environmental objectives of this package to an high extent.
no surface sowings or overseeds will be carried out. Species inseminations can be made from the local flora only in cases where certain portions of the meadow degrade or are accidentally affected	High	N.A.	N.A.	It is recommended to maintain the criterion.
drainage of parcels under commitment shall be prohibited	High	High	N.A.	
Specific conditions – valid for Sub- package 9.1 and Sub- package 9.2				
the use of chemical fertilizers and pesticides is prohibited (P)	High	High	High	Limiting the use of chemical inputs contributes to all environmental objectives covered by the package. It is recommended to maintain the criterion.
it is prohibited to plough or discuss grasslands existing on farms with on-going commitments	High	High	High	Encouraging agricultural practices based on manual work and avoiding the use of mechanized machinery contributes to reducing greenhouse gas and ammonia emissions from agriculture. It is recommended to maintain the criterion.
beneficiaries keep a record of agricultural activities related to the implementation of agri-environmental requirements	High	High	High	The criterion's contribution to environmental aspects is very significant.
the beneficiaries of the measure will have to prove that they have the necessary competences to implement commitments or undertakes to obtain the necessary knowledge and information or to ensure expertise needed in the area of implementation of agri-environment and climate commitments through services advice or advice, covering at least aspects relating to the identification of parcels agricultural, completion and submission	High	High	High	The criterion is relevant for environmental objectives in terms of possessing the skills needed to comply with agri-environmental requirements (eco-conditionality). It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	FA 4A	FA 4B	FA 5D	
of commitments and payment applications, management measures applicable at farm level necessary to comply with the basic requirements and specific requirements of commitments				

Measure 10 – Agri-environment and climate

Sub measure 10.1 – Raising farm animals of local breeds in danger of abandonment

Package 10 – ecological refuges on arable land for common bird species associated with agricultural land

Direct contribution

FA 4A – Restoration, conservation and development of biodiversity, including in Natura 2000 areas, in areas facing natural or other specific constraints and in farming activities of high natural value, and the state of European landscapes

Indirect contribution

FA 4B – Improving water management, including fertilizer and pesticide management

Indirect contribution

FA 5D – Reduction of greenhouse gas and ammonia emissions from agriculture

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
Eligible area				
Package 10 – ecological refuges in arable land for associated common bird species	High	N.A.	Average	It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
agricultural land targets arable land in Bărăgan, delimited in the Programme at ATU level LAU2, other than those eligible for P7.				
commitments under P10 apply at agricultural parcel level and there is no possibility change of parcels during commitments	High	High	High	It is recommended to maintain the criterion.
Beneficiary				
is the user of an agricultural area located on the territory of Romania, identifiable in the Integrated Administration and Control System (IACS), located in eligible areas and having an eligible use category	N.A.	N.A.	N.A.	It is recommended to maintain the criterion.
has a minimum farm area of 1 ha and eligible parcels have a minimum size of 0,3 ha	High	High	High	The impact of the criterion on environmental aspects is significant. It is recommended to maintain the criterion.
undertake to maintain the agri-environmental commitment for a period of at least 5 years from the date of its signature	High	High	High	It is recommended to maintain the criterion.
undertake to comply with the relevant basic requirements and requirements specific to the agri-environmental packages for which they apply	High	High	High	It is recommended to maintain the criterion.
undertakes to keep a record of agricultural activities linked to the implementation of agri-environmental requirements (basic and specific to areas under commitment)	High	High	High	The criterion's contribution to environmental aspects is significant. It is recommended to maintain the criterion.
Specific conditions				

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Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
at least 30 % of the area of each parcel under commitment shall be uncultivated. The 30 % will be divided as follows: ○ a fixed compaction of at least 10 % of the area of each parcel shall be kept uncultivated for 4 years of the commitment period. This area will only be mowed/passed annually after 1st of August. In the last year of the commitment the area will be shown (P). ○ two uncultivated compact areas, each not less than 10 % of the area of each parcel, may be moved from one year to the other at the level of the parcel. Unworked areas of 10 % will be set up for a period of 1 year, starting with the autumn of each commitment year. At the level of these areas, agricultural works are prohibited for a period of 1 year, including autumn p.	High	High	High	It is recommended to maintain the criterion, which is justified by the need to ensure optimum food and nesting conditions (bird habitat islands) on land where intensive agriculture is practiced. Fixed unworked areas throughout the commitment can provide food and habitat for birds nesting on the ground during the nesting season. Rotating areas may be birds' feeding grounds during the winter.
no chemical fertilizers or pesticides (P) shall be applied to the 3 10 % areas left uncultivated each year.	High	High	High	Reducing the use of organic fertilizers contributes in the medium and long term to the conservation of biodiversity and to reducing GHG and ammonia emissions from agriculture. It is recommended to maintain the criterion.
plowing or discussing grasslands on farms with ongoing commitments shall be prohibited	High	High	High	Encouraging agricultural practices based on manual work and avoiding the use of mechanized machinery contributes to reducing greenhouse gas and ammonia emissions from agriculture. It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	DI 4A	DI 4B	DI 5D	
beneficiaries keep a record of agricultural activities related to the implementation of agri-environmental requirements	High	High	High	The criterion's contribution to environmental aspects is significant.
the beneficiaries of the measure will have to demonstrate the skills necessary to implement the commitments or undertake to obtain the necessary knowledge and information or to provide the necessary expertise in the implementation of agri-environmental and climate commitments through advisory or advisory services, covering at least the aspects related to the identification of agricultural parcels, the completion and submission of commitments and payment applications, the management measures applicable at farm level necessary to comply with the basic requirements and specific requirements of commitments	High	High	High	The criterion is relevant for environmental objectives in terms of possessing the skills needed to comply with agri-environmental requirements (eco-conditionality). It is recommended to maintain the criterion.

Measure 10 – Agri-environment and climate

Sub-measure 10.1 – Raising farm animals of local breeds in danger of abandonment

Package 11 – Important agricultural land for bustard (Otis tarda)

- sub-package 11.1 – important arable lands for bustard (Otis tarda)
  - *version 11.1.1 – conversion of arable land into meadows*
  - *version 11.1.2 – protection area for bustard (Otis tarda) on arable land*
- sub-package 11.2 – important permanent meadows for bustard (Otis tarda)
  - *version 11.2.1 – manual works on important grasslands for bustard (Otis tarda),*
  - *version 11.2.2 – works with light machinery on important grasslands for bustard (Otis tarda),*

- *version 11.2.3 – works with heavy machinery on important grasslands for bustard (Otis tarda).*

Direct contribution

FA 4A – Restoration, conservation and development of biodiversity, including in Natura 2000 areas, in areas facing natural or other specific constraints and in farming activities of high natural value, and the state of European landscapes

Indirect contribution

FA 4B – Improving water management, including fertilizer and pesticide management

Indirect contribution

FA 5D – Reduction of greenhouse gas and ammonia emissions from agriculture

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	FA 4A	FA 4B	FA 5D	
Eligible area				
P11 – Important agricultural land for bustard (Otis tarda) targets land located in areas delimited by the Programme at UAT LAU2 level	High	N.A.	Average	It is recommended to maintain the criterion.
commitments under P11 are applicable to: o arable land located in the ATU ineligible for P5, P9.1 and P10, the commitment is conditional on the maintenance of the value of the area throughout the commitment period, and the parcels to which the requirements apply may be exchanged from one year to the next, o permanent grasslands situated in the ATU that are not eligible for P1, P3.1, P3.2, P6 and P9.2 – are applied at agricultural parcel level and there is no possibility of changing parcels during the commitment period.	N.A.	N.A.	N.A.	It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	FA 4A	FA 4B	FA 5D	
Beneficiary				
uses an agricultural area located on the territory of Romania, identifiable in the IACS, located in the eligible areas and having an eligible use category,	N.A.	N.A.	N.A.	It is recommended to maintain the criterion.
has a minimum farm area of 1 ha and eligible parcels have a minimum size of 0,3 ha	High	High	High	The impact of the criterion on environmental aspects is significant. It is recommended to maintain the criterion.
undertake to maintain the agri-environmental commitment for a period of at least 5 years from the date of its signature	High	High	High	It is recommended to maintain the criterion.
undertake to comply with the relevant basic requirements and requirements specific to the agri-environmental packages for which they apply	High	High	High	It is recommended to maintain the criterion.
undertakes to keep a record of agricultural activities linked to the implementation of agri-environmental requirements (basic and specific to areas under commitment)	High	High	High	The criterion's contribution to environmental aspects is significant. It is recommended to maintain the criterion.
Specific conditions – Sub-package 11.1 – important arable land for bustard (Otis tarda):				
either grassland (variant 11.1.1) – perennial crops will be grown throughout the area under commitment (forage vegetables – alfalfa, clover, forage mixtures with perennial grass species) (P) or the following application will be observed each year: at least 20 % of straw grains, at least 40 % perennial crops (forage vegetable – alfalfa, clover, forage vegetable mixtures with perennial grass species), at least 10 % autumn rape (variant 11.1.2) (P)	High	N.A.	N.A.	The establishment of crops is important for feeding and thus preserving the habitat for the species, which is currently mainly agricultural land. It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	FA 4A	FA 4B	FA 5D	
mowing of the areas on which perennial crops were established will begin after 1 July (P)	High	N.A.	N.A.	Setting periods when agricultural activities are not allowed, or areas where such activities are limited, contribute in the medium and long term to the conservation of biodiversity. It is recommended to maintain the criterion.
an area of not less than 20 % but not more than 25 % of the perennial crop parcels (P) shall be maintained until 1 October.	High	N.A.	N.A.	It is recommended to maintain the criterion, which is justified by the need to ensure optimal feeding and nesting conditions (bird habitat islands). Rotating areas may be birds' feeding grounds during the winter.
mowing will be made from inside the parcel to the outside of the plot	High			The criterion is very specific, but relevant for biodiversity, as birds have the opportunity to leave the plot when farmers work. It is recommended to maintain the criterion.
mowing is made using a device (described in the chapter "Description of type operations") for the protection of birds nesting on the ground	High	N.A.	N.A.	The most important threat to the species is the destruction of pontoons and/or chicks during the course of the agricultural works, the most damaging being mowing and harvesting of cereals. It is recommended to maintain the criterion.
Specific conditions – Sub-package 11.2 – important grasslands for bustard (Otis tarda):				
the use of chemical fertilizers and pesticides is prohibited (P)	High	High	High	Limiting the use of chemical inputs contributes to all environmental objectives covered by the package. It is recommended to maintain the criterion.

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Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	FA 4A	FA 4B	FA 5D	
the traditional use of manure is permitted up to a maximum equivalent of 40 kg N s.a./ha (1 UVM/ha)	High	High	High	Reducing the use of organic fertilisers contributes in the medium and long term to the conservation of biodiversity and to reducing GHG and ammonia emissions from agriculture. It is recommended to maintain the criterion.
mowing will begin after 1 July (P)	High	N.A.	N.A.	Setting periods when agricultural activities are not allowed, or areas where such activities are limited, contribute in the medium and long term to the conservation of biodiversity. It is recommended to maintain the criterion.
mowing will be made from inside the parcel to the outside of the plot	High			The criterion is very specific, but relevant for biodiversity, as birds have the opportunity to leave the plot when farmers work. It is recommended to maintain the criterion.
work with mechanized machinery is not permitted on the area of grasslands under commitment except those operated with animal force (for version 11.2.1) (P) or work can be carried out with low-capacity mechanized machinery (machine with short blade and low speed of travel), being prohibited from heavy machinery (for version 11.2.2) or work can be performed with conventional/heavy mechanized machinery, but mowing is done using a device (described under the protection of the birds' version for the protection of the birds' version for the protection of the birds' version for the protection of the birds for the purposes of the protection of the birds "(s)	High	High	High/Average	Encouraging agricultural practices based on manual works and avoiding the use of mechanized machinery contributes both to preserving biodiversity and reducing GHG and ammonia emissions from agriculture. It is recommended to maintain the criterion.

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Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	FA 4A	FA 4B	FA 5D	
grazing will be performed with a maximum of 1 UVM/ha and only from 1 June	High	High	N.A.	Limiting the number of animals contributes to preserving biodiversity and water quality It is recommended to maintain the criterion.
a rough zone of at least 10 % and not more than 15 % of the area of each plot (P) shall be left until 1 September.	High	N.A.	N.A.	It is recommended to maintain the criterion, which is justified by the need to ensure optimal feeding and nesting conditions (bird habitat islands).Rotating areas may be birds' feeding grounds during the winter.
it shall be prohibited to carry out any agricultural work at night	High	N.A.	N.A.	It is recommended to maintain the criterion.
Other specific requirements of commitments				
the mowed vegetable mass must be collected from the surface of the employed grassland no later than two weeks after mowing	High	N.A.	Low	The setting of mowing periods contributes to the preservation of biodiversity. However, by incorporating the plant mass into the soil for a longer period of time, contributions would be made to reduce GHG emissions. It is recommended to maintain the criterion
flooded meadows shall not be grazed and heavy machinery works on flooded meadows shall not be allowed before two weeks after water withdrawal	High	High	N.A.	The criterion supports the environmental objectives of this package to an average extent.
ventilation, irrigation and acceleration of natural drainage of employed grasslands are prohibited	High	High	N.A.	
plowing or discussing existing grasslands on farms is prohibited	High	High	High	Encouraging agricultural practices based on manual work and avoiding the use of mechanized machinery helps to preserve biodiversity and reduce greenhouse gas and ammonia emissions from agriculture.

Criteria	Degree of adaptation to environmental objectives			Recommendations/alternatives to improve commitment
	FA 4A	FA 4B	FA 5D	
				It is recommended to maintain the criterion.
beneficiaries keep a record of agricultural activities related to the implementation of agri-environmental requirements	High	High	High	The criterion's contribution to environmental aspects is significant.
the beneficiaries of the measure will have to prove that they have the necessary competences to implement commitments	High	High	High	The criterion is relevant for environmental objectives in terms of possessing the skills needed to comply with agri-environmental requirements (eco-conditionality). It is recommended to maintain the criterion.

Measure 11 – Organic agriculture (Article 29)
Sub-measure 11.1 – support for conversion to organic farming practices and methods
Package 1 - arable crops (including fodder crops) in conversion to
organic farming,
Package 2 - vegetables in conversion to organic farming,
Package 3 - orchards in conversion to organic farming,
Package 4 - vineyards in conversion to organic farming,
Package 5 - medicinal and aromatic plants in conversion to organic farming,
Package 6 - permanent meadows in conversion to organic farming

Direct contribution
FA 4B – Improving water management, including fertilizer and pesticide management

Indirect contribution
FA 4A – Restoration, conservation and development of biodiversity, including Natura 2000 areas and areas

facing natural or other specific constraints, agricultural activities of
high natural value as well as the state of European landscapes
FA 4C – Prevention of soil erosion and improvement of soil management
FA 5E – Promoting the conservation and sequestration of carbon in agriculture and forestry
Indirect contribution

Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	FA 4B	FA 4A	FA 4C	FA 5E	
Eligible area					
agricultural land classified as arable land (Package 1, 2 and 5), orchards (Package 3), vineyards (Package 4) and permanent meadows (Package 6)	N.A.	N.A.	N.A.	N.A.	It is recommended to maintain the criterion
commitments under sub-measure 11.1 are applied at agricultural parcel level without the possibility of changing parcels during commitments	High	High	High	High	Maintaining parcels throughout the commitment period contributes to the achievement of all environmental objectives covered by the sub-measure. It is recommended to maintain the criterion
Package 6 – permanent grasslands converted to organic farming can be applied both at national level – sub-package 6.1, and in combination with agri-environment and climate commitments under Measure 10 for packages applicable on permanent meadows (Package 1, 2, 3.1, 3.2, 6, 9.2 and 11.2), in the eligible areas of these areas – sub-package 6.2, listed in Chapter 8.2 – list of eligible areas M.10, M.11, M.13,	High	High	High	High	The possibility of applying package 6.2 in combination with agri-environment and climate commitments under Measure 10 for packages applicable to permanent grasslands provides additional flexibility in accessing the support for farmers while contributing to environmental objectives by reducing the intensity of farming activities on grasslands. It is recommended to maintain the criterion
agricultural parcels used as permanent grasslands, for which an agri-environment and climate commitment is underway, are	High	High	High	High	It is recommended to maintain the criterion

Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	FA 4B	FA 4A	FA 4C	FA 5E	
not eligible for support under, Package 6, sub-package 6.1					
Beneficiaries					
falls within the category of active farmers (as defined in national definition) within the meaning of Article 9 of R (EU) No 1307/2013	N.A.	N.A.	N.A.	N.A.	The criterion is of an administrative nature and is not relevant in terms of environmental objectives. It is recommended to maintain the criterion
is the user of an agricultural area located on the territory of Romania, identifiable in the Integrated Administration and Control System (IACS)	N.A.	N.A.	N.A.	N.A.	The criterion is of an administrative nature and is not relevant in terms of environmental objectives. It is recommended to maintain the criterion
it has a minimum farm area of 1 ha, and the eligible plots have a minimum size of 0.3 ha (0,1 ha for vineyards and orchards, fruit bushes, hops, fruit nurseries and wineyards)	High	High	High	High	The criterion allows small farms to be included in the scheme, but this criterion is not directly relevant for the environmental objectives of this sub-measure. No changes to the criterion are necessary.
Is registered, every year for which it seeks legal support as an operator in organic farming	N.A.	N.A.	N.A.	N.A.	The criterion is of an administrative nature and is not relevant in terms of environmental objectives. It is recommended to maintain the criterion
concludes for the duration of the commitment a contract with a control body accredited in accordance with national law	N.A.	N.A.	N.A.	N.A.	The criterion is of an administrative nature and is not relevant in terms of environmental objectives. It is recommended to maintain the criterion
undertakes to keep a record of agricultural activities related to the implementation of commitments (e.g. base and above at the level of the areas under commitment)	High	High	High	High	The contribution of the criterion to environmental issues is high. It is recommended to maintain the criterion.
Specific requirements of commitments					
beneficiaries shall comply with organic farming practices on the agricultural areas	High	High	High	High	Compliance with organic farming practices throughout the commitment period contributes to improving water quality by

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Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	FA 4B	FA 4A	FA 4C	FA 5E	
covered by the commitment throughout its period					avoiding pesticide use and strict management of manure, preserving biodiversity by neutralizing chemical fertilizers and using biological pest control methods, preventing soil erosion and reducing greenhouse gas emissions. It is recommended to maintain the criterion.
beneficiaries shall maintain the certification of areas covered commitment to conversion to organic farming methods for a period of at least 5 years from the time of signature of that undertaking	High	High	High	High	Maintaining the commitment for a period of at least 5 years ensures key contributions to reducing water pollution and secondary contribution to preserving biodiversity, preserving soil fertility and reducing greenhouse gas emissions. It is recommended to maintain the criterion.
beneficiaries shall keep a record of agricultural activities related to implementation of commitments	High	High	High	High	The criterion's contribution to environmental aspects is high. It is recommended to maintain the criterion.
beneficiaries will have to prove that they have the necessary competences to implement commitments or undertake to obtain the necessary knowledge and information or to ensure expertise needed in the area of organic farming commitments through counseling services, covering at least aspects relating to the identification of parcels agricultural, completion and submission of commitments and payment applications, management measures applicable at farm level necessary for compliance with basic requirements and specific requirements of commitments	High	High	High	High	The criterion is relevant for the environmental objectives from the perspective of having the necessary competencies in the field of organic farming. It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	FA 4B	FA 4A	FA 4C	FA 5E	
in the case of permanent grasslands for which commitments are made, it shall be ensured throughout the period commitment a minimum animal load of 0,3 UVM/ha	High	N.A.	N.A.	N.A.	Limiting the load of animals on employed areas contributes to the preservation of biodiversity. It is recommended to maintain the criterion.

Measure 11 – Organic agriculture (Article 29)
Sub-measure 11.2 – Support to maintain organic farming practices
Package 1 – agricultural crops on arable land (including fodder plants) certified in organic farming,
Package 2 – Certified vegetables in organic farming,
Package 3 – certified orchards in organic agriculture,
Package 4 – certified live in organic farming,
Package 5 – certified medicinal and aromatic plants in organic agriculture,
Package 6 – certified permanent grasslands in organic farming
Direct contribution
FA 4B – Improving water management, including fertilizer and pesticide management

Indirect contribution
FA 4A – Restoration, conservation and development of biodiversity, including Natura 2000 areas and areas facing natural or other specific constraints, agricultural activities of high natural value as well as the state of European landscapes
FA 4C – Prevention of soil erosion and improvement of soil management
FA 5E – Promoting the conservation and sequestration of carbon in agriculture and forestry
Indirect contribution

Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	FA 4B	FA 4A	FA 4C	FA 5E	
Eligible area					
agricultural land classified as arable land (Package 1, 2 and 5), orchards (Package 3), vineyards (Package 4) and permanent meadows (Package 6)	N.A.	N.A.	N.A.	N.A.	It is recommended to maintain the criterion
commitments under sub-measure 11.1 are applied at agricultural parcel level without the possibility of changing parcels during commitments	High	High	High	High	Maintaining parcels throughout the commitment period contributes to the achievement of all environmental objectives covered by the sub-measure. It is recommended to maintain the criterion
Package 6 – permanent grasslands converted to organic farming can be applied both at national level – sub-package 6.1, and in combination with agri-environment and climate commitments under Measure 10 for packages applicable on permanent meadows (Package 1, 2, 3.1, 3.2, 6, 9.2 and 11.2), in the eligible areas of these areas – sub-package 6.2, listed in Chapter 8.2 – list of eligible areas M.10, M.11, M.13,	High	High	High	High	The possibility of applying package 6.2 in combination with agri-environment and climate commitments under Measure 10 for packages applicable to permanent grasslands provides additional flexibility in accessing the support for farmers while contributing to environmental objectives by reducing the intensity of farming activities on grasslands. It is recommended to maintain the criterion
agricultural parcels used as permanent grasslands, for which an agri-environment and climate commitment is underway, are not eligible for support under, Package 6, sub-package 6.1	High	High	High	High	It is recommended to maintain the criterion
Beneficiaries					
falls within the category of active farmers (as defined in national definition) within	N.A.	N.A.	N.A.	N.A.	The criterion is of an administrative nature and is not relevant in terms of environmental objectives. It is recommended to maintain the criterion

Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	FA 4B	FA 4A	FA 4C	FA 5E	
the meaning of Article 9 of R (EU) No 1307/2013					
is the user of an agricultural area located on the territory of Romania, identifiable in the Integrated Administration and Control System (IACS)	N.A.	N.A.	N.A.	N.A.	The criterion is of an administrative nature and is not relevant in terms of environmental objectives. It is recommended to maintain the criterion
it has a minimum farm area of 1 ha, and the eligible plots have a minimum size of 0.3 ha (0,1 ha for vineyards and orchards, fruit bushes, hops, fruit nurseries and wine growing)	High	High	High	High	The criterion is relevant from the perspective of the environmental objectives of this sub-measure. No changes to the criteria are required.
registered, every year for which it seeks legal support as an operator in organic farming	N.A.	N.A.	N.A.	N.A.	The criterion is of an administrative nature and is not relevant in terms of environmental objectives. It is recommended to maintain the criterion
concludes for the duration of the commitment a contract with a control body accredited in accordance with national law	N.A.	N.A.	N.A.	N.A.	The criterion is of an administrative nature and is not relevant in terms of environmental objectives. It is recommended to maintain the criterion.
undertakes to keep a record of agricultural activities related to the implementation of commitments (e.g. base and above at the level of the areas under commitment)	High	High	High	High	The criterion's contribution to environmental aspects is significant. It is recommended to maintain the criterion
Specific requirements of commitments					
beneficiaries of the sub-measure shall comply with organic farming practices on the agricultural areas covered by the commitment throughout its period	High	High	High	High	Compliance with organic farming practices throughout the commitment period contributes to improving water quality by avoiding pesticide use and strict management of manure, preserving biodiversity by neutralising chemical fertilisers and using biological pest control methods, preventing soil erosion and reducing greenhouse gas emissions.

Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	FA 4B	FA 4A	FA 4C	FA 5E	
					Maintaining the commitment for a period of at least 5 years ensures key contributions to reducing water pollution and secondary contribution to preserving biodiversity, preserving soil fertility and reducing greenhouse gas emissions. It is recommended to maintain the criterion.
beneficiaries keep a record of agricultural activities related to implementation of commitments	High	High	High	High	The contribution of the criterion to environmental issues is high. It is recommended to maintain the criterion.
the beneficiaries of the measure will have to prove that they have the necessary competences to implement commitments or undertakes to obtain the necessary knowledge and information or to provide the necessary expertise in the implementation of organic farming commitments through advisory or advisory services, covering at least issues related to the identification of agricultural parcels, the completion and submission of commitments and payment applications, management measures applicable at farm level necessary for compliance with basic requirements and specific requirements of commitments	High	High	High	High	The criterion is relevant for the environmental objectives from the perspective of having the necessary competencies in the field of organic farming. It is recommended to maintain the criterion.
in the case of permanent grasslands for which commitments are made, it shall be ensured throughout the period	High	N.A.	N.A.	N.A.	Limiting the animal load on the employed areas contributes to the conservation of biodiversity. It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	FA 4B	FA 4A	FA 4C	FA 5E	
commitment a minimum animal load of 0,3 UVM/ha					

Measure 13 – Payments for areas facing natural constraints or other specific constraints (Article 31)
Sub-measure 13.1 – compensatory payment in mountain area
Sub-measure 13.2 – compensatory payment for other areas facing significant natural constraints
Sub-measure 13.3 – compensatory payment for other areas affected by specific constraints

Direct contribution
FA 4C – Prevention of soil erosion and improvement of soil management
Indirect contribution
FA 4A – Restoration, conservation and development of biodiversity, including Natura 2000 areas and areas facing natural or other specific constraints, agricultural activities of high natural value as well as the state of European landscapes

Criteria	Degree of adaptation to environmental objectives		Recommendations/alternatives to improve commitment
	FA 4C	FA 4A	
the beneficiary of the support shall fall within the category of active farmer defined within the meaning of Article 9a Regulation (EU) 1307/2013 according to the national legislation	N.A.	N.A.	The criterion is of an administrative nature and is not relevant in terms of environmental objectives. It is recommended to maintain the criterion
the beneficiary is the user of an agricultural area located on the territory of Romania, identifiable in the Integrated Administration and Control System (IACS) in the area eligible for the mountain area	N.A.	N.A.	The criterion is not targeted biodiversity conservation. However. Mountain areas and areas affected by significant and specific natural constraints hold an important weight

Criteria	Degree of adaptation to environmental objectives		Recommendations/alternatives to improve commitment
	FA 4C	FA 4A	
delimited in accordance with Article 32 (2) of Regulation (EU) 1305/2013, or areas experiencing significant natural constraints in Article 32 (3) of Regulation (EU)1305/2013, or the area eligible for areas facing other specific constraints, delimited in accordance with the provisions of Article 32 (4) of Regulation (EU) 1305/2013			from the territory of Romania, overlapping with large areas of associated land as having a High Nature Value. At the same time, these areas do not allow intensive agriculture, support is intended to encourage the maintenance of agricultural activities in these areas. It is recommended to maintain the criterion.
minimum farm area is 1 ha and eligible parcels have a minimum size of 0,3 ha (in cases provided for in the specific conditions of the single area payment scheme for certain crop types, the minimum area of the plot must be at least 0,1 ha	High	High	The criterion is relevant from the perspective of the environmental objectives of this sub-measure. No changes to the criteria are required.
the beneficiary undertakes, on an annual basis, to continue its agricultural activity on an agricultural land located in areas affected by natural constraints	Unknown / low	Unknown / low	Without any specific commitment, continuing agricultural activity on agricultural land situated in areas affected by significant constraints do not ensure the prevention of erosion and sustainable soil management, as well as maintaining the rural landscape and preserving biodiversity. It is recommended to maintain the criterion, but activities should be couple with other commitment from measures directly related to soil and biodiversity management (e.g. M10)
Other conditions			
compliance of beneficiaries, at the level of the whole farm, with the established cross-compliance standards pursuant to Chapter VI of Title VI of Regulation (EU) No. 1306/2013, foreseen in the national legislation.	High	High	Compliance with cross compliance rules contributes to environmental objectives (prevention and reduction of soil erosion phenomena and indirectly to biodiversity issues) It is recommended to maintain the criterion.

Measure 8 – Investment in the development of forest areas and in improving the viability of forests (Articles 21-26)

Sub-measure 8.1 – Deforestation and creation of wooded areas

Direct contribution

FA 5E – Promoting the conservation and sequestration of carbon in agriculture and forestry

Indirect contribution

FA 4A – Restoration, conservation and development of biodiversity, including Natura 2000 areas and areas facing natural or other specific constraints, agricultural activities of high natural value as well as the state of European landscapes

Indirect contribution

FA 4B – Improving water management, including fertilizer and pesticide management

Indirect contribution

FA 4C – Prevention of soil erosion and improvement of soil management

Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	FA 5E	FA 4A	FA 4B	FA 4C	
Eligible land is agricultural and non-agricultural land (as defined in the measure technical sheet) located throughout the national territory.	High	High	High	High	The forest area in Romania covers about 28.3 % of the total area of the national land fund, below the European average of 37.6 %, and below the optimal level for Romania, identified by the Forest Research and Planning Institute as 35 %. By promoting afforestation of agricultural and non-agricultural areas located throughout the national territory, high contributions are made to all environmental objectives covered by this measure – support carbon sequestration, adaptation to the effects of climate change, reducing soil erosion, improving

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Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	FA 5E	FA 4A	FA 4B	FA 4C	
					water retention capacity and restoring and preserving local biodiversity. This criterion is correlated with the principle of land localization (giving priority to lands proposed for afforestation located in areas deficient in forests. Ex. Călărași, Teleorman, Constanţa, Ialomița, Brăila, Galați etc.) It is recommended to maintain the criterion.
The area of land proposed for afforestation in order to achieve protective forest curtains shall be at least 0,5 ha and the minimum compact forested area shall be at least 0,1 ha.	High	High	High	High	The criterion enables the selection of those projects aimed at afforestation of a significant area of land so that it benefits all environmental objectives covered by this sub-measure. At the same time, the criterion is corroborated with the principle of selection on the size of the plantation, giving priority to land aimed at afforestation of larger areas. It is recommended to maintain the criterion.
The area proposed for afforestation for forest bodies will be at least 1 ha and the minimum compact forested area will be at least 0.5 ha.	High	High	High	High	The criterion enables the selection of those projects aimed at afforestation of a significant area of land so that it benefits all environmental objectives covered by this sub-measure. At the same time, the criterion is corroborated with the principle of selection on the size of the plantation, giving priority to land aimed at afforestation of larger areas. It is recommended to maintain the criterion.

Criteria	Degree of adaptation to environmental objectives				Recommendations/alternatives to improve commitment
	FA 5E	FA 4A	FA 4B	FA 4C	
Persons in difficulty as defined in the State Aid Guidelines for rescuing and restructuring non-financial firms in difficulty are not eligible.	Low	Low	Low	Low	The criterion is an administrative one, with the aim of avoiding the appropriation of projects by undertakings which, in theory, cannot ensure the finality of the projects. While justified, the criterion is not relevant in terms of environmental objectives.
Afforestation projects on Natura 2000 sites must correspond to the objectives set for these areas, accompanied by the Environmental Agreement/Natura 2000 Approval.	Average	High	Average	Average	The criterion is extremely relevant, especially in view of achieving the environmental objective set by ID 4A.Individual enforcement through Natura 2000 site management plans brings the expected benefits for these areas. The criterion also makes additional contributions to the other environmental objectives, as the environmental agreement/Natura 2000 opinion requires compliance with certain rules on carbon sequestration, water management, or soil erosion. It is recommended to maintain the criterion.

Measure 15 – Forest-environmental services, climate services and forest conservation (Article 34)

Sub-measure 15.1 – payments for forest-environment and climate commitments

Package 1 – Ensuring quiet areas

Direct contribution

FA 4A – Restoration, conservation and development of biodiversity, including in Natura 2000 areas and areas facing natural or other specific constraints, farming activities of high natural value and the state of European landscapes

Indirect contribution

FA 5E – Promoting the conservation and sequestration of carbon in agriculture and forestry

Package 2 – Use of harnesses to collect wood from thinning

Direct contribution

FA 4C – Prevention of soil erosion and improvement of soil management

Indirect contribution

FA 5D – Reduction of greenhouse gas and ammonia emissions from agriculture

Criteria	Degree of adaptation to environmental objectives Package 1		Degree of adaptation to environmental objectives Package 2		Recommendations/Alternatives for improvement
	FA 4A	FA 5D	FA 4C	FA 5D	
Eligible area					
Land covered with forests and land intended for afforestation or reforestation shall be subject to application, with the exception of areas falling under functional type I (T I), provided that the land intended for afforestation or reforestation does not represent more than 15 % of the employed area.	High	High	High	High	It is recommended to maintain the criterion.
The minimum area for which the commitment is concluded shall be at least 100 ha.	High	High	High	High	The criterion enables the selection of those projects aimed at afforestation of a significant area of land so that it benefits all environmental objectives covered by this sub-measure. It is recommended to maintain the criterion.
The areas covered by the commitment shall be identified in electronic form.	N.A.	N.A.	N.A.	N.A.	The eligibility criterion is of an administrative nature and is of no direct relevance to environmental objectives. It is recommended to maintain the criterion.
The area must be part of a forestry arrangement in force (the arrangement is considered to be in place after the minutes of the second conference of planning have been approved, which means the start of the period to apply the commitment).	Average	Average	Average	Average	The criterion is related to the administrative efficiency of the sub-measure, the relevance for the environmental objective being medium. It is recommended to maintain the criterion.
Beneficiaries					

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Criteria	Degree of adaptation to environmental objectives Package 1		Degree of adaptation to environmental objectives Package 2		Recommendations/Alternatives for improvement
	FA 4A	FA 5D	FA 4C	FA 5D	
The beneficiary is the holder of a forest land area within National Forest Fund, located on the territory of Romania	High	High	High	High	It is recommended to maintain the criterion.
The beneficiary undertakes to maintain the forestry-environmental commitment for a period of 5 years from the date of its signature	High	High	High	High	Maintaining the commitment over a period of 5 years ensures direct contributions to the conservation of biodiversity and indirect elements, to reducing soil erosion, protecting water resources, reducing greenhouse gas emissions and increasing soil carbon storage. It is recommended to maintain the criterion.
The beneficiary undertakes to comply with the specific requirements of the forest-environment packages for which he applies.	High	High	High	High	It is recommended to maintain the criterion
The beneficiary must have a contract to manage/provide forestry services with an authorised Forestry Service.	N.A.	N.A.	N.A.	N.A.	The relevance of the criterion to environmental objectives cannot be identified. The criterion seems to be related to the administrative efficiency of the sub-measure.
The beneficiary must participate in a production and/or protection facility with all the area he owns.	N.A.	N.A.	N.A.	N.A.	The relevance of the criterion to environmental objectives cannot be identified. The criterion seems to be related to the administrative efficiency of the sub-measure.

Relevance of agri-environmental and climate commitments

*Table 8. **Habitat and species conservation objectives***

Measure	Contribution	Localization	Target (e.g. species and habitats)	Type of request	Relevance of the request
M10 (All packages except P4 and P5)	Direct	Areas covered depending on species distribution and specific risks identified	HNV areas, birds, butterflies.	Use of fertilizers and pesticides is forbidden	Positive impact on the structure and diversity of species
				Types of agriculture works authorized, including grazing and mowing date	Specific species and sites / habitats
				Traditional use of manure	Maintains natural fertility and contributes to the health of ecosystems, in support of biodiversity
M15	Direct	Forests in the National Forest Funds	Quiet areas for all species	Limitation in forest works	Positive impact on the structure and diversity of species in forest ecosystems
M11	Indirect	National	Not specified	Organic farming	Maintains natural fertility in the soil and contributes to the health of ecosystems, in support of biodiversity
M13	Indirect	Mountains areas (sM13.1), Danube Delta (sM13.3), areas with significant natural constraints (sM13.2)	Not specified	Not specified	The relevance of M13 requirements in relation to biodiversity conservation is indirect. M13 can be combined with M10 packages

Source: developed by the team of evaluators based on research activities

*Table 9: **Soil and water management objectives***

Measure	Contribution	Localization	Target (e.g. species and habitats)	Type of request	Relevance of the request
M10	Direct (package 4)	National	Soil management	The use of fertilizers and pesticides is prohibited	High for water quality
				Soil management	High in relation to the conservation of agriculture
				Green crops	The activities of the measure could be complemented by minimal mechanical work

Measure	Contribution	Localization	Target (e.g. species and habitats)	Type of request	Relevance of the request
M11	Direct	National	The use of fertilizers and pesticides is prohibited	Organic farming	High for water quality
M13	Direct	National	Land abandonment in areas with natural handicaps	Not specified	It is not specific. It can be combined with the commitments of M11 and M10 packages
M15	Direct (package 2)	Forests in the National Forest Funds	Soil management	Animals for works	High for forest soils
M08	Indirect	Agricultural and non-agricultural lands	Soil use	Afforestation on agricultural land	High for degraded soil and water quality in cultivated areas

Source: developed by the team of evaluators based on research activities

*Table 10: **Objectives to mitigate the effects of climate change***

Measure	Contribution	Localization	Target (e.g. species and habitats)	Type of request	Relevance of the request
M10	Indirect (some of the packages)	Areas of interest for nature conservation	Soil management	The use of fertilizers and pesticides is prohibited	High, fertilizer is one of the most important sources of CO2 emissions in agriculture
				Categories of authorized agricultural work, including grazing and mowing scheduling	Indirectly, the limitation of number of LBU per hectare is positive
				Traditional use of manure	High, the manure is one of the most important sources of CO2 emissions in agriculture
M15	Indirect	Forests in the National Forest Funds	Soil management	Animals for works	No fossil fuel consumption
M08	Direct	Agricultural and non-agricultural lands	Carbon sequestration	Afforestation	Carbon sequestration by afforestation is one of the main mitigation methods

Source: developed by the team of evaluators based on research activities

*Table 11: **Objectives of adaptation to the effects of climate change***

Measure	Contribution	Localization	Target (e.g. species and habitats)	Type of request	Relevance of the request
M10	Direct (package 5) and indirect (through all the other packages)	Areas under desertification Other areas of interest for nature conservation	Water use efficiency through proper soil management Biodiversity conservation Soil management	Crops cultivation	Addresses climate change directly
				Mowing scheduling	It directly addresses climate change and temperature changes
				Minimum tillage	Improves soil structure and carbon retention capacity
				Traditional use of manure and increasing the use of animals	Indirectly, by improving soil and biodiversity management
				The use of fertilizers and pesticides is prohibited	Indirectly, by improving water quality and biodiversity management
M11	Indirect (all packages)	National	Fertilizer and pesticides uses	Organic farming	Improving soil management and water use efficiency
M13	Indirect	Mountains areas (sM13.1), Danube delta (sM13.3), areas with handicaps (sM13.2)	Land abandonment in areas with natural handicaps	Not specified	Contributes to avoid abandonment and lack of land management, but there are no specific commitments related to adaptation to climate change
M15	Indirect	Forests in the National Forest Funds	Soil management	Animal works	Improving forest resilience
M08	Indirect	Agricultural and non-agricultural lands	Soil use	Afforestation	Impact on soil and water circulation in nature, especially in degraded areas and areas with large surfaces of arable land and a low percentage of forests / forest protection curtains

Source: developed by the team of evaluators based on research activities

*Table 12: **Sustainable development objectives***

Measure	Contribution	Localization	Target (e.g. species and habitats)	Type of request	Relevance of the request
M10	Indirect (Package 2)	Areas with HNV	Soil management – through traditional practices	Manual works Light equipment use Permanent pasture	Indirectly, by supporting traditional practices, the rural economy / jobs and supporting the development of rural areas in areas affected by natural constraints (and demographic decline)
M11	Indirect	National	?	Organic farming	
M13	Indirect	Mountains areas (sM13.1), Danube Delta (sM13.3), areas with significant natural constraints (sM13.2)	Land abandonment	Not specified	

Source: developed by the team of evaluators based on research activities

Legend

Level of relevance	Significance
High relevance	Fully contributes to the achievement of objectives
Medium relevance	Contributes to the achievement of objectives, but indirectly
Low relevance	No specific items

In general, greater support is needed from programme authorities in collecting data in environmental areas (soil, water, biodiversity and risks). In many cases, data are not available or are not updated (eg farmland-specific bird index), which prevents a correct assessment of the program's contribution to environmental quality. In addition, assessments should be specific and broken down - conducted at the level of the environmental theme, or territories.

Annexes

A.1 Maps

The NRDP contribution, in terms of surface supported at the end of 2019, is represented for each measure in the following maps:

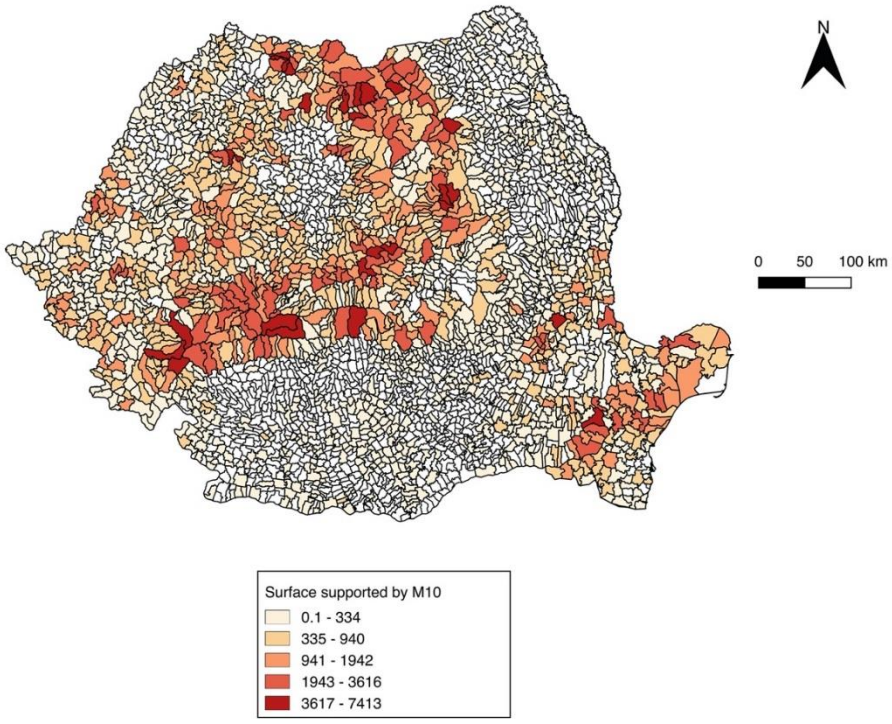

Figure A1 Surface supported by M10 (Unit of measurement: hectares; Source: Evaluator elaboration based on M10 2019 Database)

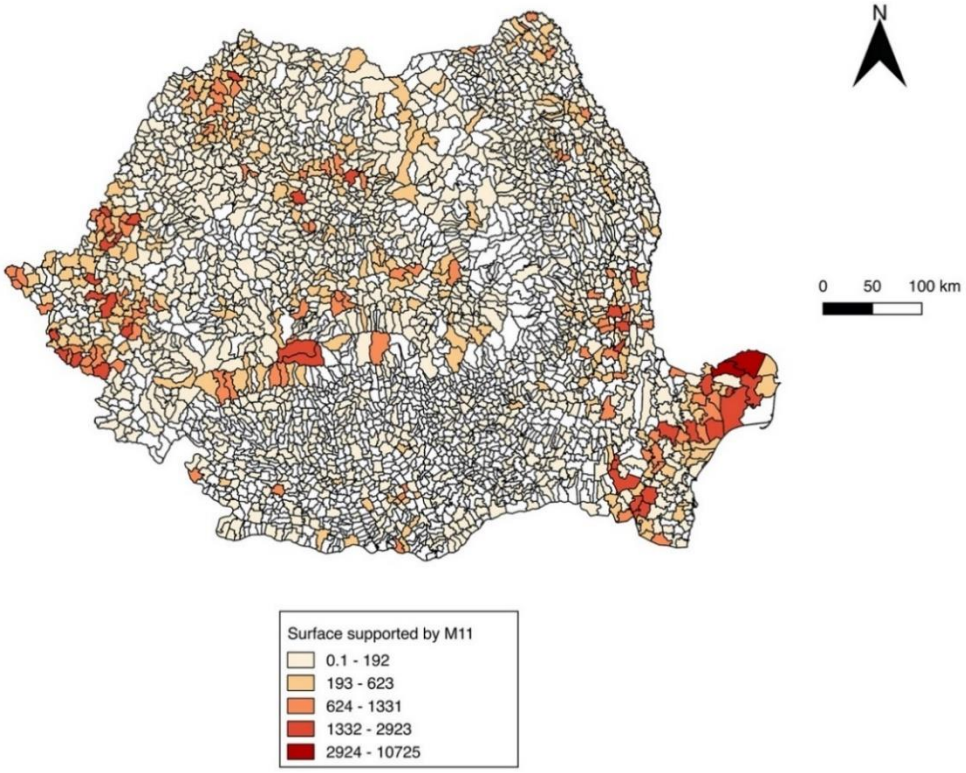

Figure A2 Surface supported by M11 (Unit of measurement: hectares; Source: Evaluator elaboration based on M11 2019 Database)

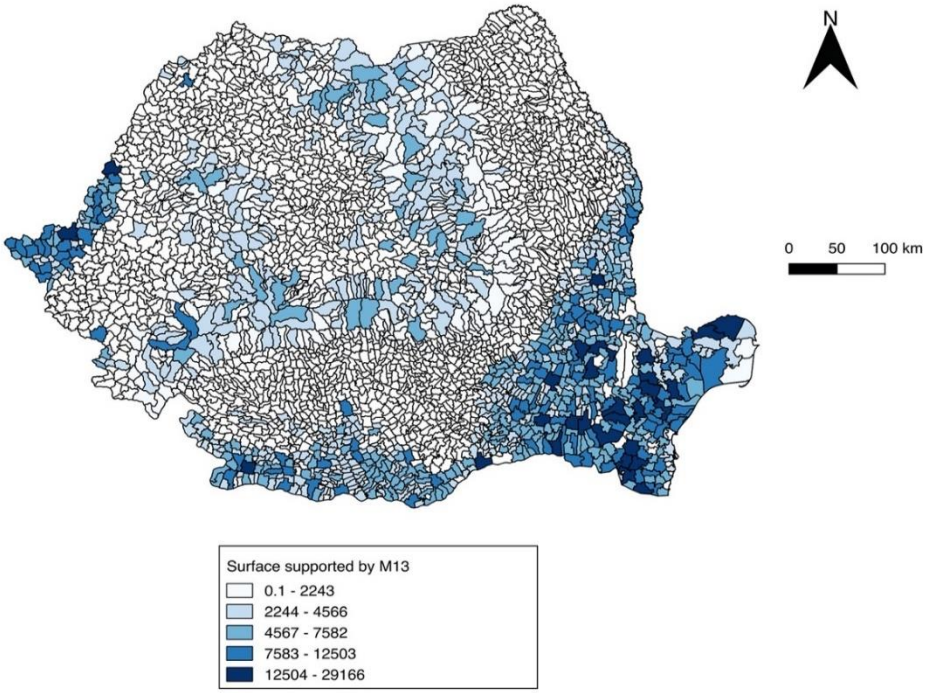

Figure A3 Surface supported by M13 (Unit of measurement: hectares; Source: Evaluator elaboration based on M13 2019 Database)

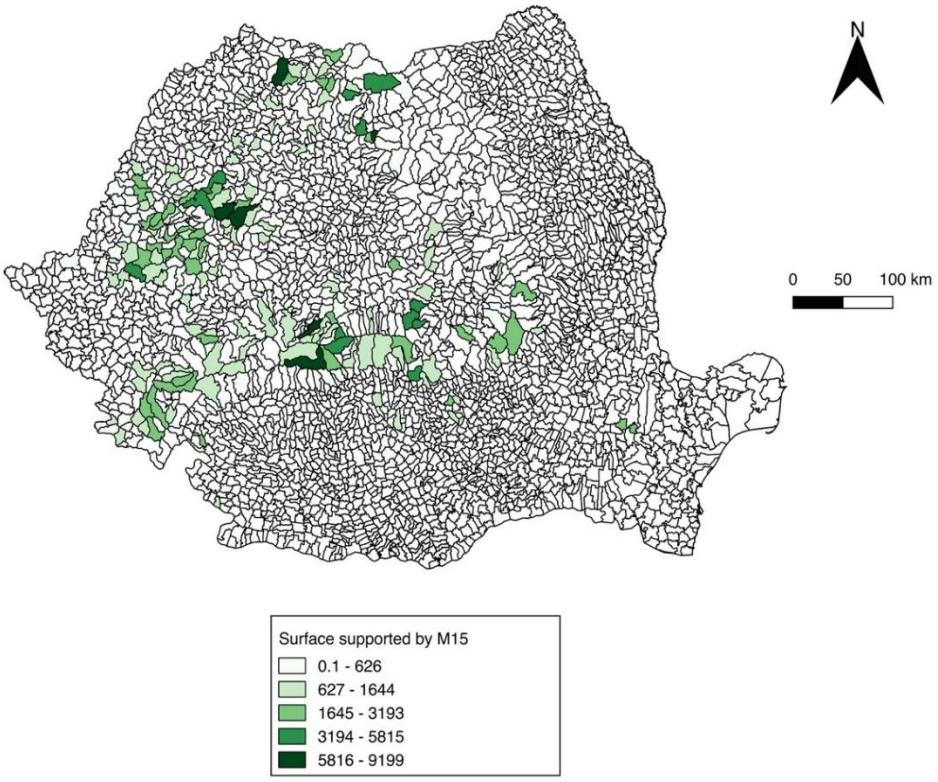

Figure A4 Surface supported by M15 (Unit of measurement: hectares; Source: Evaluator elaboration based on M15 2019 Database)

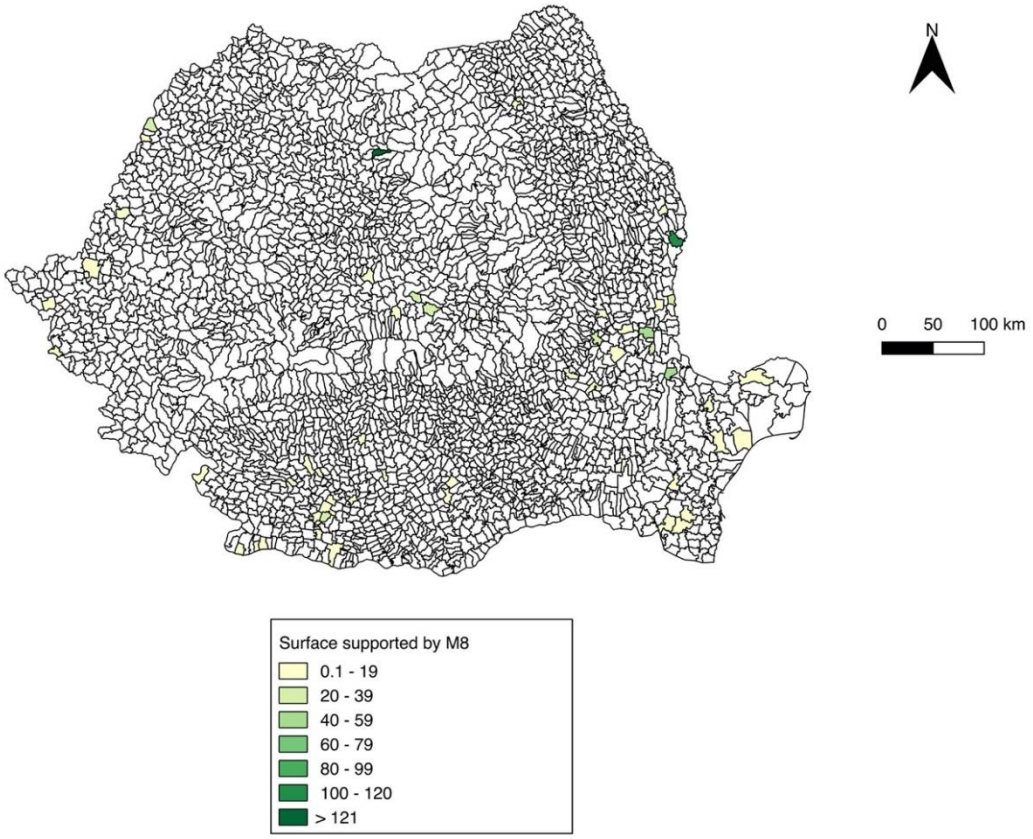

Figure A5 - Surface supported by M8 (Unit of measurement: hectares; Source: Evaluator elaboration based on M8 2019 Database)

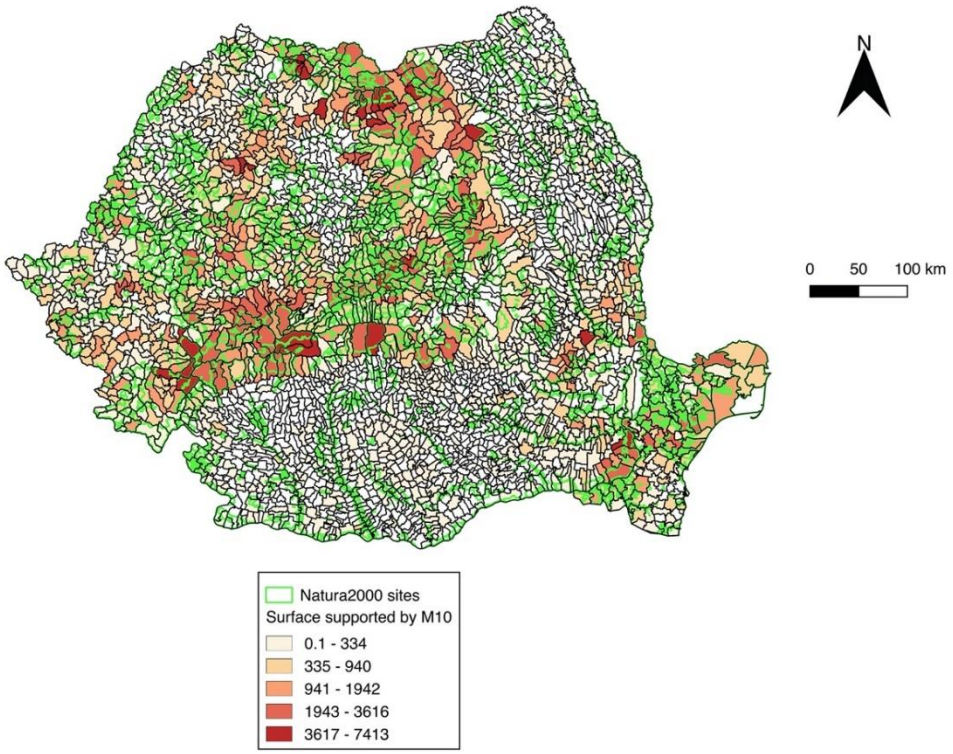

Figure A6 Surface supported by M10 and distribution of Natura 2000 network (Unit of measurement: hectares; Source: Evaluator elaboration based on M10 2019 Database)

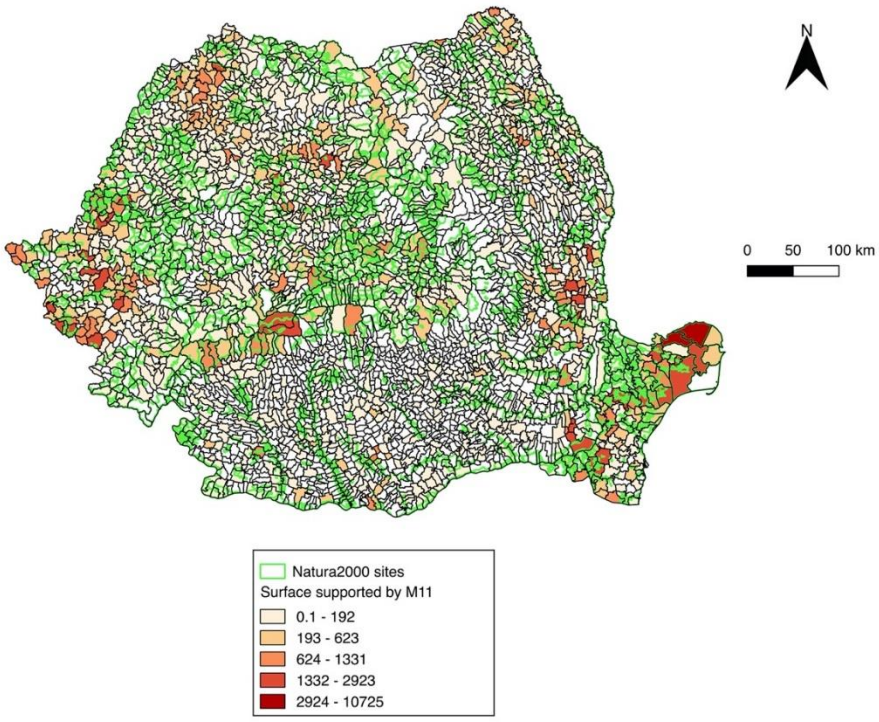

Figure A7 - Surface supported by M11 and distribution of Natura 2000 network (Unit of measurement: hectares; Source: Evaluator elaboration based on M11 2019 Database)

A.2 Survey to beneficiaries

The questionnaires received covered measures M10, M11 and M13, the number of answers being the following: 128 answers for M10, 87 answers for M11 and 247 answers for M13. The results are summarized in the following tables:

Table 11 Results of the survey addressed to the beneficiaries

Quality of environment				
	M10	**M11**	**M13**	**Total**
In your opinion, the support provided by NRDP 2014-2020:				
No. of answers	**125 (27.7%)**	**85 (18.8%)**	**241 (53.4%)**	**451**
contributed to the improvement of the natural environment	81 (64.8%)	64 (75.29%)	142 (58.9)	287 (63.6%)
contributed to maintaining the natural environment unchanged	28 (22.4%)	11 (12.94%)	46 (19.09%)	85 (18.8%)
contributed to the aggravation of the natural environment	0 (0%)	1 (1.18%)	3 (1.24%)	4 (0.8%)
did not influence the natural environment	9 (7.20%)	4 (4.71%)	19 (7.88%)	32 (7.09%)
I don't know / I can't appreciate	6 (4.80%)	4 (4.71%)	30 (12.45%)	40 (8.8%)
other	1 (0.80%)	1 (1.18%)	1 (0.41%)	3 (0.6%)

Ecosystem services				
	M10	**M11**	**M13**	**Total**
Through M10, NRDP supported the maintenance or introduction of traditional agricultural practices. Based on your experience, have these traditional practices contributed to the use of soil and water resources, without leading to depletion of resources, ensuring continuity for the younger generation and without damaging or affecting nature?				
No of answers	**125 (100%)**	**-**	**-**	**125**
yes, to a small extent	45 (36%)	-	-	45 (36%)
yes, significantly	57 (45.60%)	-	-	57 (45.60%)
no	10 (8%)	-	-	10 (8%)
I don't know / I can't appreciate	13 (10.40%)	-	-	13 (10.40%)
In your opinion, has the organic agriculture - supported by M11 of NRDP - contributed to improving the resources (of soil and water), without leading to the depletion of resources, ensuring continuity for the younger generation and without damaging or affecting nature?				
N° of answer	**86 (100%)**	**-**	**-**	**86**
yes, to a small extent	24 (27.9%)	-	-	24 (27.9%)
yes, significantly	55 (63.9%)	-	-	55 (63.9%)
no	3 (3.49%)	-	-	3 (3.49%)
I don't know / I can't appreciate	4 (4.65%)	-	-	4 (4.65%)

Adaptation to climate change				
	M10	**M11**	**M13**	**Total**
Have you ever been harmed by climate change?				
No of answers	**125**	**86**	**244**	**455**
yes	81 (64.8%)	73 (84.8%)	210 (86.07%)	364 (80%)
no	28 (22.4%)	10 (11.6%)	19 (7.79%)	57 (12.5%)
I don't know / I can't appreciate	0 (0%)	3 (3.5%)	15 (6.15%)	18 (3.95%)
If yes				
No of answers	**118 (28.8%)**	**75 (18.3%)**	**217 (52.9%)**	**410**

decreased water quality	9 (7.6%)	5 (6.6%)	14 (6.45%)	28 (6.8%)
low crop yields	57 (48.3%)	36 (48%)	115 (53%)	208 (50.7%)
land abandonment	3 (2.54%)	1 (1.33%)	3 (1.38%)	7 (1.70%)
changes in optimal conditions for animal husbandry	8 (6.78%)	2 (2.67%)	2 (0.92%)	12 (2.9%)
damage to agricultural infrastructure due to extreme weather events	25 (21.19%)	19 (25.3%)	53 (24.4%)	97 (23.6%)
reducing soil fertility	8 (6.78%)	6 (8%)	21 (9.68%)	35 (8.53%)
I did not suffer any damage	1 (0.85%)	1 (1.33%)	0	2 (0.48%)
others (weather changes, drought)	6 (5.08%)	5 (6.7%)	6 (2.76%)	17 (4.14%)
If you have suffered damages from climate change, please quantify the intensity of the damage:				
No of answers	**116 (27.7%)**	**76 (18.18%)**	**226 (54.06%)**	**418**
significant damages	30 (25.8%)	30 (39.5%)	56 (24.8%)	116 (27.7%)
medium level damages	65 (56.03%)	32 (42.11%)	120 (53.1%)	217 (51.9%)
small damages	16 (13.79%)	11 (14.47%)	36 (15.9%)	63(15.07%)
I did not suffer any damage	1 (0.86%)	1 (1.32%)	0	2 (0.48%)
I don't know / I can't appreciate	3 (2.59%)	2 (2.63%)	14 (6.19%)	19 (4.54%)
other (drought)	1 (0.86%)	0	0	1 (0.86%)
What kind of adjustments did you made to agricultural practices in order to adapt to climate change?				
No of answers	**-**	**-**	**244 (100%)**	**244**
wider use of technologies for water collection, soil moisture conservation	-	-	96 (39.3%)	96 (39.3%)
modification of varieties / species, with the most suitable from a thermal point of view and / or with an increased resistance to thermal shock and drought	-	-	69 (28.28%)	69 (28.28%)
fertilizer modification	-	-	31 (12.7%)	31 (12.7%)
changing the amount of irrigation, the irrigation schedule or other practices related to water management	-	-	22 (9.02%)	22 (9.02%)
none	-	-	12 (4.92%)	12 (4.92%)
others	-	-	5 (2.05%)	5 (2.05%)
Did these adjustments incur additional costs?				
No of answers	**-**	**-**	**93 (100%)**	**93**
in terms of the equipment required	-	-	57 (61.29%)	57 (61.29%)
in terms of time allocatted	-	-	7 (7.53%)	7 (7.53%)
in terms of resources used	-	-	19 (20.4%)	19 (20.4%)
we did not incur additional costs	-	-	8 (8.6%)	8 (8.6%)
I don't know	-	-	2 (2.15%)	2 (2.15%)
Did these adjustments result in loss of income?				
No of answers	**-**	**-**	**240 (100%)**	**240**
yes	-	-	167 (69.6%)	167 (69.6%)
no	-	-	47 (19.6%)	47 (19.6%)
I don't know	-	-	26 (10.8%)	26 (10.8%)
If so, the loss of income was:				
No of answers	-	-	283 (100%)	283
generated by higher costs of the resources used	-	-	194 (68.55%)	194 (68.55%)
generated by the lower volume of production	-	-	75 (26.05%)	75 (26.25%)

generated by changes in the product categories obtained	-	-	9 (3.18%)	9 (3.18%)
no	-	-	3 (1.06%)	3 (1.06%)
I don't know	-	-	1 (0.35%)	1 (0.35%)
others	-	-	1 (0.35%)	1 (0.35%)

Sustainable development				
	M10	**M11**	**M13**	**Total**
Based on your experience, has the NRDP helped reduce abandonment in rural areas?				
No of answers	**125 (27.5%)**	**86 (18.9%)**	**244 (53.6%)**	**455**
yes, to a small extent	44 (35.2%)	33 (38.4%)	57 (23.4)	134 (29.4%)
yes, significantly	52 (42.4%)	33 (38.4%)	128 (52.5%)	213 (46.8%)
no	10 (8%)	10 (11.6%)	25 (10.25%)	45 (9.89%)
I don't know / I can't appreciate	18 (14.4%)	9 (10.5%)	32 (31.11%)	59 (12.9%)
others	0	0	2 (0.82%)	2 (0.82%)
If so, did NRDP contribute to your decision to continue the agricultural activity?				
No of answers	**122 (28.2%)**	**73 (16.9%)**	**237 (54.8%)**	**432**
yes, to a small extent	28 (22.9%)	18 (24.6%)	67 (28.3%)	113 (26.1%)
yes, significantly	80 (65.6%)	53 (72.6%)	133 (56.12%)	266 (61.6%)
no	8 (6.56%)	7 (9.8%)	22 (9.28%)	37 (8.6%)
I don't know / I can't appreciate	6 (4.92%)	2 (2.7%)	14 (5.9%)	22 (5.1%)
others	1 (0.82%)	1 (1.37%)	1 (0.42%)	3 (0.7%)

Source: developed by the team of evaluators based on research activities

A.3 Survey to experts

For drafting this study, 13 questionnaires from University experts have been collected and analysed, covering the topics of biodiversity, water, soil and climate change. In addition, 5 forest guards have filled in a specific questionnaire related to forest management.

Area	Institution	No. of answers
Biodiversity conservation	"Danube Delta" National Research and Development Institute - INCDDD Tulcea DEPARTMENT OF BIODIVERSITY CONSERVATION AND SUSTAINABLE USE OF NATURAL RESOURCES DEPARTMENT OF BIODIVERSITY CONSERVATION AND SUSTAINABLE USE OF NATURAL RESOURCES INFORMATION AND GEOMATICS SYSTEM DEPARTMENT	3
Water quality	Romanian Academy Institute of Geography	1
Water quality	Fundulea National Institute for Agricultural Research and Development	1
Pedology	Faculty of Agriculture, USAMV Bucharest	1
Pedology	Faculty of Agriculture, USAMV Cluj-Napoca	1
Pedology	"Valahia" University of Târgoviște	1
Pedology	Faculty of Agriculture, USAMV Bucharest	1

Area	Institution	No. of answers
	Department of Soil Sciences	
Pedology	"Marin Drăcea" National Institute for Forestry Research and Development	1
Climate change	University of Pitesti	1
Climate change	Polytechnic University of Timisoara	1
Forestry	"Marin Drăcea" National Forestry Research and Development Institute	1

The results are summarized in the following tables:

Table 12 Results of the questionnaires applied among the university experts

Biodiversity conservation						
Score	**1**	**2**	**3**	**4**	**5**	**Total**
Did the support provided by NRDP 2014-2020 contribute to the conservation of birds?						
N° of answers	-	-	2	-	1	11/15
Territorial relevance			Național (2)		Counties (1)	
Did the support provided by NRDP 2014-2020 contribute to the conservation of butterflies?						
N° of answers	-	1	2	-	-	8/15
Territorial relevance		Național (1)	Counties (2)			
Did the support provided by NRDP 2014-2020 contribute to the conservation of plants?						
N° of answers	-	-	2	1	-	10/15
Territorial relevance			Counties (1) National (1)	Counties (1)		
The support provided by NRDP 2014-2020 has contributed to the conservation of biodiversity in general						
N° of answers	-	1	1	-	1	10/15
Territorial relevance		Național (1)	Counties (1)		Counties (1)	
The support provided by NRDP 2014-2020 contributed to maintaining the natural environment unchanged						
N° of answers	-	1	1	1	-	9/15
Territorial relevance		Național (1)	Counties (1)	Counties (1)		
The support provided by NRDP 2014-2020 contributed to the degradation of the natural environment						
N° of answers	2	1	-	-	-	4/15
Territorial relevance	Counties (2)	Național (1)				
The support provided by NRDP 2014-2020 did not influence the natural environment						
N° of answers	-	-	1	2	-	11/15
Territorial relevance			Counties (1)	Counties (1) National (1)		
In your opinion, is the information provided by the national / regional statistical system or by the literature, in general, sufficient to provide answers to question 1?						
	Yes		No	Don't know		**Total**
N° of answers	2			1		66.6% yes 33.3% no
How do you think NRDP measures and packages could be improved to better contribute to habitat conservation?						

	Coverage of several species of birds, insects or plants	Specific guidelines regarding the management of program interventions	Increasing the concentration of financial resources on several habitats and ecosystems	Other measures	**Total**
N° of answers	2	1	1	1	40% - Larger biodiversity's coverage 20% - Specific guidelines on intervention management 20% - More concentration of financial resources on few habitats 20% - Other measures

Environmental services (water and soil)						
Score	**1**	**2**	**3**	**4**	**5**	**Total**
Soil productivity has increased over the past five years						
N° of answers	1	-	2	-	-	7/25
Territorial relevance	Regional (1)	-	National (2)	-	-	
Soil productivity has remained unchanged for the past five years						
N° of answers	-	-	4	-	-	12/25
Territorial relevance	-	-	National (2) Regional (2)	-	-	
Soil productivity has declined over the past five years						
N° of answers	-	-	2	1	-	10/25
Territorial relevance	-	-	National (2)	Regional (1)	-	
Surface water quality has increased in the last five years						
N° of answers	-	1	-	1	-	6/10
Territorial relevance	-	Counties (1)	-	National (1)	-	
Groundwater quality has increased in the last five years						
N° of answers	-	1	1	-	-	5/10

Environmental services (water and soil)						
Territorial relevance	-	Counties (1)	National (1)	-	-	
Surface water quality has remained unchanged for the past five years						
N° of answers	-	1	1	-	-	5/10
Territorial relevance	-	Counties (1)	National (1)	-	-	
Groundwater quality has remained unchanged for the past five years						
N° of answers	-	1	1	-	-	5/10
Territorial relevance	-	Counties (1)	National (1)	-	-	
Surface water quality has deteriorated in the last five years						
N° of answers	-	1	1	-	-	5/10
Territorial relevance	-	National (1)	Counties (1)	-	-	
Groundwater quality has deteriorated over the past five years						
N° of answers	-	-	1	1	-	7/10
Territorial relevance	-	-	Counties (1)	National (1)	-	
Please give a score from 1 to 5 (where 1 = low contribution and 5 = high contribution) to assess the contribution of the interventions of measure 10 - Agri-environment and climate, from the National Rural Development Programme 2014-2020, to the quality of water and soil						
Score	**1**	**2**	**3**	**4**	**5**	**Total**
The use of chemical fertilizers and pesticides is prohibited						
N° of answers for water	-	-	-	-	2	10/10
N° of answers for soil	-	-	3	1	-	13/25
The traditional use of manure is allowed up to the equivalent of a maximum of 40 kg N s.a./ha (1 LBU / ha)						
N° of answers for water	-	1	-	1	-	6/10
N° of answers for soil	-	1	2	2	-	16/25
The traditional use of manure is allowed up to the equivalent of a maximum of 30 kg N s.a./ha						
N° of answers for water	1	-	-	1	-	5/10
N° of answers for soil	-	2	2	1	-	14/25
Mowing can only start after July 1 (for lands located in TAUs with average altitudes greater than or equal to 600 m) or after June 15 (for lands located in TAUs with average altitudes lower than 600 m)						
N° of answers for water	2	-	-	-	-	2/10
N° of answers for soil	-	2	2	-	-	10/25
Mowing must be done by 1st of July at the latest						
N° of answers for water	2	-	-	-	-	2/10
N° of answers for soil	1	2	1	-	-	8/25
Mowing can only start after August 25th						
N° of answers for water	1	1	-	-	-	3/10

Environmental services (water and soil)						
N° of answers for soil	1	2	-	1	-	9/25
Mowing can be done manually or with low capacity mechanized equipment, the use of heavy machinery being prohibited						
N° of answers for water	1	1	-	-	-	3/10
N° of answers for soil	-	-	2	-	2	16/25
Grazing is carried out with a maximum of 1 LBU per hectares / 0.7 LBU per hectares						
N° of answers for water	-	1	1	-	-	5/10
N° of answers for soil	-	-	2	1	2	20/25
Work with mechanized equipment is not allowed on the surface of traditional meadows and orchards under commitment, except those operated by animal force						
N° of answers for water	1	-	-	1	-	5/10
N° of answers for soil	1	-	2	-	1	12/25
Mowing can be done with low capacity mechanized equipment (short blade machines and low travel speed), it is forbidden to use heavy equipment						
N° of answers for water	1	-	1	-	-	4/10
N° of answers for soil	-	-	4	-	1	17/25
Work with mechanized machines is not allowed on the surface of the meadows under commitment except those operated by animal force or the works can be performed with low capacity mechanized machines (mowing with machines with short blade and low travel speed), being prohibited the use of heavy equipment						
N° of answers for water	1	-	-	1	-	5/10
N° of answers for soil	-	-	4	-	1	17/25
The biomass formed must be incorporated into the soil by 31 March at the latest						
N° of answers for water	1	1	-	-	-	3/10
N° of answers for soil	-	-	1	1	1	12/25
For each spring crop (maize, sorghum, sunflower, soybean) committed on the cultivated area, at least 2 hybrids / varieties with different precocities (early or semi-early and semi-late or late) are used simultaneously in equal proportions						
N° of answers for water	1	1	-	-	-	3/10
N° of answers for soil	-	1	3	-	-	11/25
Adaptation of the sowing programme to the requirements of climate change						
N° of answers for water	-	2	-	-	-	4/10
N° of answers for soil	-	-	2	-	2	16/25
Use of minimum tillage methods						
N° of answers for water	-	2	-	-	-	4/10

Environmental services (water and soil)						
N° of answers for soil	-	-	-	2	1	13/25
Application of manure in compost form						
N° of answers for water	-	-	2	-	-	6/10
N° of answers for soil	-	-	-	1	4	24/25
Actions to accelerate the natural drainage of grasslands under commitment are prohibited						
N° of answers for water	-	-	1	1	-	7/10
N° of answers for soil	-	-	-	1	3	19/25
How do you think NRDP measures and packages could be improved in order to better contribute to soil conservation?						
	Re-launch the same types of packages / measures	Specific orientations regarding the management of programme interventions	Increasing the concentration of financial resources on few types of interventions	Other solutions		**Total**
N° of answers	-	3	4	2		33.3% - specific orientations regarding the management of programme interventions 44.4% - concentration of financial resources on few typologies of interventions 22.2% - other solutions
How do you think the NRDP measures and packages could be improved in order to better contribute to water quality?						
	Re-launch the same types of packages / measures	Specific orientations regarding the management of programme interventions	Increasing the concentration of financial resources on few types of interventions	Other solutions		**Total**
N° of answers	1	-	1	-		50% - Re-launch the same measures

Environmental services (water and soil)					
					50% - increasing the concentration of financial resources on few typologies of interventions

Climate change						
Please give a score from 1 to 5 (where 1 = totally disagree and 5 = totally agree) to the following statements, based on your experience and knowledge						
Score	**1**	**2**	**3**	**4**	**5**	**Total**
The annual average temperature has increased over the last 10 years						
N° of answers	-	-	1	1	-	7/10
The annual average temperature has decreased over the last 10 years						
N° of answers	2	-	-	-	-	2/10
The annual temperature distribution has changed in the last 10 years (eg colder summers, warmer winters etc.)						
N° of answers	-	-	1	1	-	7/10
The annual average rainfall has increased over the last 10 years						
N° of answers	-	1	1	-	-	5/10
The annual average rainfall has decreased over the last 10 years						
N° of answers	-	1	1	-	-	5/10
The annual rainfall regime has changed in the last 10 years						
N° of answers	-	-	1	1	-	7/10
Please indicate which practices / activities, supported by NRDP 2014-2020, have the highest relevance in terms of combating climate change, by giving a score from 1 to 5 (where 1 = low relevance and 5 = high relevance)						
Score	**1**	**2**	**3**	**4**	**5**	**Total**
Organic farming						
N° of answers	-	1	-	1	-	6/10
Low-impact agricultural practices (low-capacity equipment; "minimum tillage" systems that reduce soil handling to increase crop production, leaving a certain amount of crop residue on the soil surface etc.)						
N° of answers	-	1	-	-	1	7/10
Efficient irrigation systems						
N° of answers	-	-	-	1	1	9/10
Green crops (agricultural practice that leaves part of the crop in the field to improve the condition of the soil)						
N° of answers	-	-	-	2	-	8/10
Creating new forested areas						
N° of answers	-	-	-	-	2	10/10
Increasing the diversity of forest species (with plantations of different species)						
N° of answers	-	-	-	2	-	8/10
Introduction of new more soil-friendly methods / technologies for wood collection and transport						
N° of answers	-	-	1	-	1	8/10
Mitigation to climate change (Forest sector)						
Score	**1**	**2**	**3**	**4**	**5**	**Total**
In the last 10 years, the quality of forests has improved and the capacity to absorb CO2 has increased						
N° of answers	-	-	-	1	-	4/5
In the last 10 years, the quality of forests has deteriorated and the capacity to absorb CO2 has decreased						
N° of answers	1	-	-	-	-	1/5

Climate change						
In the last 10 years, the total area of forests has increased						
N° of answers	-	-	1	-	-	3/5
In the last 10 years, the total forest area has reduced						
N° of answers		1	-	-	-	2/5
How do you think NRDP measures could be improved to better contribute to climate change adaptation?						
	Re-launch the same measures	Specific orientations regarding the management of programme interventions	Increasing the concentration of financial resources on few types of interventions	Other solutions		**Total**
N° of answers	1	-	-	-		100% - Re-launch the same measures

Typology of experts	Comments
Biodiversity	
Expert 1	More projects should be financed through PNDR, in order to better contribute to habitat conservation
Expert 2	Concerning the available information, data on the programme and its implementation are reported, but data on concrete results and environmental benefits are still missing (qualitative and quantitative data regarding the effect of the implemented measures on biodiversity). Corroboration of the results of the programme implementation with those from research and with those at the continental / global level regarding the population dynamics of species, the dynamics of climate change and the probable influences on species and habitats.
Expert 3	Financing with larger amounts but at longer intervals can increase the efficiency of the use of financial resources (in one year or in another period of time) for certain species.
Soil	
Expert 5	In order to improve the way in which the NRDP contributes better to soil conservation, the following measures should be applied: application of composted manure, incorporation of biomass in the soil, the use of soil minimum tillage systems and prohibition of the use of heavy machinery.
Expert 6	In order to improve the way in which the NRDP contributes to soil conservation, the following actions should be promoted: Introduction of the obligation to monitor soil resources at the level of ATUs through national programme (according to MARD Order 278/2011, but in compliance with Annex 1) and the obligation to perform agrochemical mapping by farmers once every 4 years - introduced as an obligation by GAEC. Moreover, other actions should be carried out, as mandatory introduction of green manures (for all spring crops since April), conservative agriculture and forest curtains - supported by corresponding payments. Finally, the Soil Law should be approved and also the ban on deforestation for the next 10 years, raising at the same time the degree of afforestation in Romania to 40%, and at least 16% at the ATU level (as measure to combat desertification).
Expert 7	The application of manure, incorporation of biomass into the soil, soil minimum tillage systems, prevention and control of soil erosion need to be promoted in the NRDP, in order to better contribute to soil conservation.
Expert 9	There is need to promote the use of traditional methods but with the use of modern means (tools and equipment easy to use with batteries or light equipment with high productivity used for the support of traditional methods), promotion of agroforestry systems within NRDP, in order to better contribute to soil conservation.
Water	
Expert 13	Support for organic farming in surface and groundwater areas should be promoted within the NRDP, in order to better contribute to water quality improvement
Climate change	
Expert 10	The agricultural practices beneficial for climate and environment, supported by NRDP, are: crop diversification, maintenance of existing permanent grasslands, areas of ecological interest.

Source: developed by the team of evaluators based on research activities

A.3 Questionnaire addressed to Forest Guards

Table 13: Results of the questionnaires applied at the level of the Forest Guards

How do you consider the general contribution of forests/forestry sector to environmental and climate services at national level, over the period 2014-2020? Please give a score from 1 to 5 (where 1 = total disagreement and 5 = total agreement) to the following statements						
Climate change mitigation						
Score	**1**	**2**	**3**	**4**	**5**	**Total**
Quality of forests has improved and their role as carbon sink has increased						
N° of answers	-	-	4	-	1	17/25
Adaptation to climate change						
Score	**1**	**2**	**3**	**4**	**5**	**Total**
Forests are contributing to soil quality and fertility						
N° of answers	-	-	-	1	4	24/25
Forests are contributing to water quality and availability						
N° of answers	-	-	-	-	5	25/25
Forests are contributing to habitat and species conservation						
N° of answers	-	-	-	1	4	24/25
Forests are contributing to reducing land abandonment						
N° of answers	-	-	2	1	2	20/25
In your opinion, has the measure 8 contributed to the objectives of Priority 4 'Restoring, preserving and enhancing ecosystems related to agriculture and forestry' and of Priority 5 'Promoting the efficient use of resources and support transition to a low carbon economy and resistant to climate changes in agricultural, food and forest sectors' of NRDP 2014-2020? In what extend?						
	Yes		No			**Total**
N° of answers	1		4			80% - no 20% - yes
Which are the main weaknesses limiting the contribution of measure 8 to the above mentioned NRDP objectives? Please give a score from 1 to 5 (where 1 = irrelevant and 5 = extremely relevant)						
Score	**1**	**2**	**3**	**4**	**5**	**Total**
Type of beneficiaries (not covering all potential beneficiaries)						
N° of answers	3	2	-	-	-	7/25
Type of commitment						
N° of answers	2	1	1	-	1	12/25
Areas covered (to be limited or extended)						
N° of answers	1	-	2	-	2	16/25
Financial support (not adequate to the investment and its management)						
N° of answers	1	1	1	-	2	16/25
Administrative burden (complexity of administrative procedure)						
N° of answers	-	1	2	-	2	17/25
Effectiveness and efficiency in implementation (possible lack of competencies)						
N° of answers	-	2	-	1	2	18/25
In your opinion, to what extent are the selection principles of measure 8 useful for improving the effectiveness of intervention in adapting and mitigating the effects of climate change? Please give a score from 1 to 5 (where 1 = irrelevant and 5 = extremely relevant) to each principle.						
Score	**1**	**2**	**3**	**4**	**5**	**Total**

Land location principle (priority will be given to land proposed for afforestation located in forest deficit areas)						
N° of answers for adaptation	-	1	1	1	2	19/25
N° of answers for mitigation	-	-	1	1	1	12/25
The principle of the size of the plantation (priority will be given to the land proposed for afforestation with a larger area)						
N° of answers for adaptation	2	-	1	1	1	12/25
N° of answers for mitigation	1	-	1	1	2	18/25
Principle of the protection function (priority will be given to the implementation of forest protection curtains)						
N° of answers for adaptation	2	-	-	1	3	21/25
N° of answers for mitigation	1	-	1	1	3	23/25
The principle of the rehabilitation function of the lands (priority will be given to the afforestation of the lands located in the ATU affected by phenomena of aridity, erosion or salinization, depending on the values of the aridity index, the degree of erosion or the degree of salinization)						
N° of answers for adaptation	1	1	-	1	2	17/25
N° of answers for mitigation	-	1	-	1	1	11/25
The principle of species diversity (priority will be given to afforestation works that propose at least 2 basic species in the composition)						
N° of answers for adaptation	-	-	3	-	1	11/25
N° of answers for mitigation	1	-	2	1	-	11/25
In your opinion, has the measure 15 contributed to the objectives of Priority 4 'Restoring, preserving and enhancing ecosystems related to agriculture and forestry' and of Priority 5 'Promoting the efficient use of resources and support transition to a low carbon economy and resistant to climate changes in agricultural, food and forest sectors' of NRDP 2014-2020? To what extent?						
	Yes	No	I don't know			**Total**
N° of answers	3	1	1			60% -yes 20% -no 20% -I don't know
What are the main weaknesses limiting the contribution of measure 15 to the above mentioned NRDP objectives? Please give a score from 1 to 5 (where 1 = irrelevant and 5 = extremely relevant)						
Score	**1**	**2**	**3**	**4**	**5**	**Total**
Type of beneficiaries (not covering all potential beneficiaries)						
N° of answers	2	2	1	-	-	9/25
Type of commitment						
N° of answers	3	1	1	-	-	8/25
Areas covered (to be limited or extended)						
N° of answers	3	-	1	-	1	11/25
Financial support (not adequate to the investment and management)						

N° of answers	1	1	1	-	2	16/25
Administrative burden (complexity of administrative procedures)						
N° of answers	-	1	-	2	2	20/25
Effectiveness and efficiency in implementation (possible lack of competencies)						
N° of answers	1	1	2	-	1	13/25

In your opinion, how could measures 8 and 15 of the NRDP be improved to better contribute to climate change mitigation and adaptation in the next 2021-2027 programming period? Please mark one or more of the following actions with an "X"			
Re-proposing the same measures in the same areas			
	M15	M8	**Total**
Re-proposing the same measures in the same areas	4 .	4	80% M15 80% M8
Adopting more specific management intervention orientations, such as:			
	M15	M8	**Total**
Covering other categories of beneficiaries	2	1	40% M15 20% M8
New eligibility and selection criteria	3	5	60% M15 100% M8
Introduction of simplified procedures	3	3	60% M15 60% M8
More specific location of interventions	1	1	20% M15 20% M8
Adopting more specific financial management orientations, such as:			
	M15	M8	**Total**
Concentration of financial resources on few typologies of interventions	3	2	60% M15 40% M8
Increasing the financial intensity of the support	2	2	40% M15 40% M8
Other actions/measures (please specify):			
	M15	M8	**Total**
N° of answers	-	3	60 % M8

Source: developed by the team of evaluators based on the research activities

Forest guard	Comments
Forest's environmental and climate services	
Forest guard 3	Improvement of the forest quality was not registered, but rather a stagnation because of the low attractiveness of this measure. Forests contribute to soil fertility on the close areas, without any other further contribution on extended areas (at a distance of a few kilometres outside the forest) and to water quality, ensuring its filtration from rain, as well as a constant flow of the rivers. Finally, forest contributes to habitat conservation, forming ecosystems at all levels (from soil to crown).
Forest guard 4	Concerning the improvement in forest quality and forest absorption, the structure and quality of the stands did not improve significantly, because of the errors in the application of technical rules, thus there is the need for continuous assessment of how they are managed.
Forest guard 5	Concerning the improvement of forest quality and forest absorption, the assessment of the forests at national level is lacking. Forests have multiple roles: contribute to soil fertility, through the process of humidifying the soils, have hydrological role, reducing also aridity by creating a specific environment, and contribute to habitat conservation and protection of hunting fauna. Thus, through afforestation, degraded / unproductive lands are reintroduced into the productive circuit.
M8	
Forest guard 1	The contribution of Measure 8 to the objectives of Priority 4 and 5 is negligible due to poor accessing. Approved applications covered a total area of about 800 ha at national level. Compared to the total agricultural area of Romania, the area that will be possibly afforested by Measure 8 is insignificant.
Forest guard 2	Measure 8 contributed to priorities 4 and 5 to a very small extent due to the fact that very few projects have been implemented. Concerning improvement on M8 effectiveness against climate change, for the next programming phases, the strategy of accepting in the afforestation formula of some faster growing species (ex: acacia, poplar) and providing reduced financial support compared to the standard one should be reviewed.
Forest guard 3	The contribution of M8 to the objectives of the Priority 4 is reduced, because conservation or consolidation of existing ecosystems is not realized. In terms of M8's contribution to priority 5, the support for the transition to a low-carbon and climate-resilient economy in the agricultural sector has not been significant. Concerning M8 financial support, the costs of planting a forest are very high, so a large initial amount is needed, that most potential beneficiaries do not own or are not willing to invest. At the same time, the financial instruments providing support for agriculture, compete, therefore, potential beneficiaries prefer to maintain agricultural land to receive support from the PAIA and not to benefit from the help offered by the measure 8. Concerning M8 administrative burden, the bureaucratic route and the waiting times are too long, as well as the complexity of the applicant's guide. The reduced effectiveness in M8 implementation is caused by a low flexibility of potential beneficiaries in terms of changing the area of activity. At the same time, there is a preference for afforestation with species with rapid growth, which provide finished products in a shorter time. Concerning M8 contribution to climate change, location of the land is a very important principle, the need for forest curtains in the plain area being one of the most pressing needs and the size of the plantation principle restricts significantly the possibility for accessing funds. Even if larger areas make larger contributions, afforestation is needed on any area. Concerning rehabilitation function of the land principle, even if the impact is major, it is difficult to implement. Concerning improvement on M8 effectiveness against climate change, for the next programming phases, M8 should not be in competition with other measures of the NRDP.

Forest guard 4	Measure 8, theoretically contributes to priorities 4 and 5, by increasing the area covered by forests, but practically for the newly formed forest ecosystems through Measure 8, decades are needed in order to reach the maximum protection capacity and the extent of the application of Measure 8 is insignificant. Concerning M8 implementation, there is the problem that the maintenance works are not settled to the ATUs (and their associates) and the losses caused by meteorological phenomena are not taken into account. Concerning M8 administrative burden, the list of evaluated files is communicated late, and certain findings, imposed by the procedure's manual, cannot be made retroactively. Concerning M8 contribution to climate change, the principle of location of the land is calculated at the county level, and minimizes the importance of the plain areas of the counties that have locations in different geographical areas and the size plantation principle is still important, especially in the plain area in order to mitigate the desertification phenomena. Concerning the forest protection principle, extreme priority will be given to the easy realization of forest curtains for the protection of agricultural crops, the gridding of agricultural crops through forest curtains, with major implications on zonal microclimates and agricultural production. Concerning improvement on M8 effectiveness against climate change, for the next programming phases, score given to the evaluation of the file (in "area of counties deficient in forests") should be modified, the application procedures should be simplified, financing period for the restoration of the plantation should be extended (Order 766/2007) and maintenance works should be financed at ATU level. Finally, sanctions should be eliminated when it is not the fault of the beneficiary.
Forest guard 5	Regarding the M8 contribution to priorities 4 and 5, the respondent stated that he does not have sufficient information to assess the actual contribution. However, a significant increase in forested areas, financed by measure 8.1, should contribute greatly to the achievement of priorities 4 and 5, provided that forests are managed continuously in forest regime, based on management contracts with legally certified forest structures. granted in lei / m or lei / km. Administrative procedures (guides and procedure manuals) need to be substantially simplified. In the notes issued by PAIA - the owner of the database with agricultural / non-agricultural lands - it is necessary to specify the correspondence between the cadastral sites resulting from the property deeds - physical blocks - plots identified in the online IPA system and areas subject to afforestation. The efficiency and effectiveness in M8 implementation are conditioned by the quality of the works carried out by the afforestation companies; at the moment there are very few truly competent companies on the market. Concerning improvement on M8 effectiveness against climate change, for the next programming phases, it is necessary to target only beneficiaries who own land / forests, to give a higher score to forest landowners to the detriment of applicants for financial support who own leased land, to simplify guidelines and procedure manuals and to adapt them to the territorial specificity, excluding leaseholders or companies from the program. Moreover, forests created by M8 should be managed in a forest regime, based on forest arrangements and PAIA requirements to track the works done on the plots identified in the LPIS system should be deleted and the follow-up of the works must take into account the planning units delimited by the afforestation projects. Finally, the decision to afforest permanent natural grasslands should belong exclusively to the owners. The areas to be afforested should have a minimum of 0.25 ha, with a length / width ratio that allows the creation of forest bodies.
M15	
Forest guard 1	Given the poor access rate during session 1 and the fact that the areas committed in session 2 are only at the beginning of their 2nd year of commitment, it is not possible to quantify the contribution of M15 to the objectives of Priorities 4 and 5.
Forest guard 2	M15 contributed greatly to the objectives of Priority 4 and to a small extent to the objectives of Priority 5. Beneficiaries are not encouraged to apply for M15 because they receive the money very late (after 3 years) from the beginning of the implementation of the measure.

Forest guard 3	Concerning M15 contribution to Priority 4 and 5, it is directed towards the conservation of the forest fund and ecosystems. Concerning the type of beneficiaries of M15, it excludes beneficiaries with small forests. This is justified by the fact that indeed, the contribution is higher when the supported area is larger. Concerning type of commitments, no limitations were found due to the conditioning of the use of the harnesses. An increase in financial support for M15 should be promoted, in order to increase the attractiveness of the measure and a simplification of the guide is needed. In order to promote M15 implementation, workshops for beneficiaries, at local or regional level, should be organized. Concerning improvement on M15 effectiveness against climate change, for the next programming phases, smallholders should be included as beneficiaries.
Forest guard 4	Concerning M15 contribution to Priority 4 and 5, M15 favored a less aggressive management of the forest, by establishing a quiet area and by restricting the number and mode of the interventions in the other areas belonging to the employed area. Areas affected by accidents should be included in the payment in M15. At administrative level, a special department, at the level of the Forest Guard, is necessary to verify, during the whole period of the year, the activity from the employed areas and to increase the efficiency and effectiveness of M15 implementation in conjunction with the applicant guidelines, which is designed extremely complex, unfriendly both in form and content. Concerning improvement on M15 effectiveness against climate change, for the next programming phases, package 2 (thinning), should be eliminated because is difficult to be understood and applied by the beneficiary. Finally, the support should be extended on the whole surface, regardless of the appearance of accidental products.
Forest guard 5	In what concerns the M15 contribution to Priorities 4 and 5, there is no assessment of the effects of this measure on ecosystems related to agriculture and forestry; considering that the minimum threshold of 20% set for the quiet area in package 1 is too low, the effectiveness of this measure is irrelevant. The provisions of M15 cover all categories of potential beneficiaries. Concerning the type of commitment, M15 does not contribute to the transition to a "low carbon economy" but to reducing the concentration of carbon dioxide in the atmosphere through the process of tree photosynthesis. It is necessary to extend the forest conservation measures by delimiting absolute quite areas to 100% of the surface and the financial support provided by M15 needs to include investment costs and to simplify administrative procedures. Concerning improvement on M15 effectiveness against climate change, for the next programming phases a higher score should be given to compact forest bodies, instead of the dispersed ones, guidelines and procedure manuals should be simplified and adapted to the territorial specificity, excluding the presence of leaseholders or companies in the programme, quiet area should be delimited, within package 1, to a minimum of more than 50% of the committed area.

A.4 Questionnaire addressed to PAIA

Agro-environmental and climate interventions - Measure 10

The main factors which have influenced the implementation of the M10 packages (state of play at the end of 2019). *Please specify in comments the elements under the direct responsibility of the NRDP management system and those which are external*.

Elements	Weaknesses	Strengths	Comments
Information of applicants		√	
Eligibility criteria		√	
Financial support	√		
Location of interventions		√	

Potential for cumulative support with M11 and M13		√	
Overlap/complementarity with interventions under the European Agricultural Guarantee Fund			NA
Other relevant factors	Failure to cover the risk of unilateral termination of land rental / lease / concession contracts by the legislation in force. Given the share of land with such a status, this is a restrictive factor or generator of sanctions.		

- Please mention the specific difficulties related to the implementation of the new P9, P10 and P11 packages

  The difficulties related to the implementation of packages 9, 10 and 11 are represented by the specific requirements that involve additional calculations and measurements at plot level (division of plot into several sub-plots).

- Improvements needed in the new programming period (please indicate if you agree with the statements below).

Statements	Yes, I agree	Comments
M10 is already efficient – just marginal improvements are needed in terms of implementing capacity	√	
There are some deficiencies to be addressed, related to:		Disagree
The number of packages		
The eligibility criteria		
Information/support to applicants		
Other needs		
Intensity of support must be redesigned in order to increase the attractiveness of the measure	√	
The support granted through M10 overlap with the support of measures/commitments under the European Agricultural Guarantee Fund (EAGF)		Disagree
Some of the M10 packages will never work and need to be completely changed (or removed)	√	

Organic farming – M11

- Main factors which have influenced the implementation of M11 (state of play at the end of 2019). *Please specify in comments the elements under the direct responsibility of the NRDP management system and those which are external*.

Elements	Weaknesses	Strengths	Comments
Information of applicants		√	
Eligibility criteria		√	
Financial support		√	
Location of interventions		√	

Potential for cumulative support with M10 P.4 and P5 and M13		√	
Other relevant factors	Failure to cover the risk of unilateral termination of land rental / lease / concession contracts by the legislation in force. Given the share of land with such a status, this is a restrictive factor or generator of sanctions.		

- Improvement for the next programming period *(please indicate if you agree with the statements below)*

Statements	Yes, I agree	Comments
M11 is already efficient – just marginal improvements are needed in terms of implementing capacity	√	
There are some deficiencies to be addressed, related to:		Disagree
Types of eligible crops / plantations		
The eligibility criteria		
Information/support to applicants		
Other needs		
Intensity of support must be redesigned in order to increase the attractiveness of the measure		
The support granted through M11 overlap with the support of measures/commitments under the European Agricultural Guarantee Fund (EAGF))		Disagree
Some of the M11 packages will never work and need to be completely changed (or removed))		Disagree

Areas facing natural constraints – M13

- Main factors which have influenced the implementation of the packages under M13

Elements	Weaknesses	Strengths	Comments
Information of applicants		√	
Eligibility criteria		√	
Financial support	√		
Location of interventions		√	
Potential for cumulative support with M10 and M11		√	
Other limiting factors			

- Improvements for the next programming period *(please indicate if you agree with the statements below)*

Statements	Yes, I agree	Comments
M11 is already efficient and is implemented in optimal parameters	√	

There are some deficiencies to be addressed, related to:		Disagree
The definition of the area with natural constrains		
The eligibility criteria		
Information/support provided to applicants		
Other needs		
Intensity of support must be redesigned in order to increase the attractiveness of the measure		Disagree
The support granted through M13 is very general and needs to focus more on few specific aspects (or be couple with other support mechanism)		Disagree

Forestry measures – M08 and M15

- Main factors which have influenced the delays in implementation of M08 and M15 (state of play at the end of 2019). *Please specify in comments, the elements under the direct responsibility of the NRDP management system and those which are external.*

Elements	M08		M15		Comments
	Weaknesses	Strengths	Weaknesses	Strengths	
Information of applicants		√		√	
Eligibility criteria		√		√	
Financial support	√		√		
Location					NA
Other factors					

- Improvement for the next programming period (please indicate if you agree with the statements below)

Measure 08 - Investments in the development of forested areas and improving the viability of forests

Statements	Yes, I agree	Comments
M08 is already efficient, no improvements are needed	√	
There are some deficiencies to be addressed, related to:		Disagree
The types of species for afforestation		
Localisation		
The eligibility criteria		
Information/support to applicants		
Other needs		
Intensity of support must be redesigned in order to increase the attractiveness of the measure	√	
M08 overlaps with other measures/commitments supported by EU and national policies		Disagree

Measure 15 – Forestry services, climate services and forest conservation

Statements	Yes, I agree	Comments
M15 is already efficient, no improvements are needed	√	
There are some deficiencies to be addressed, related to:		Disagree
Location		
The eligibility criteria		
Information/support to applicants		
Other needs		
Intensity of support must be redesigned in order to increase the attractiveness of the measure	√	
M15 overlaps with other measures/commitments supported by EU and national policies		Disagree

A.5 Literature review

Peringer, A., Gillet, F., Rosenthal, G., Stoicescu, I., Pătru-Stupariu, I., Stupariu, M. S., & Buttler, A. (2016). Landscape-scale simulation experiments test Romanian and Swiss management guidelines for mountain pasture-woodland habitat diversity. Ecological modelling, 330, 41-49.

Geographical coverage	☐ International level ☐ Eu level X National level ☐ Local level
Main topics covered	Habitat and ecosystem conservation
Evaluation questions and evaluation criteria addressed	X *E.Q.1 - To what extent has the NRDP contributed to habitat conservation?* X NRDP contribution to habitat conservation E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? ☐ NRDP contribution to services related to water quality ☐ NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to habitat conservation</u> The paper analyzes the guidelines proposed in Romania for pasture / forest management, focused on the regulation of grazing pressure. The results show that the proposed “optimal” grazing pressure (0.5ABU / ha) can obtain both a landscape structural diversity and a high degree of coverage of forest / meadow ecotones.

	Extending to the lower end of the grazing pressures proposed through the paper (0.3ABU / ha) would increase structural diversity and ecotone coverage degree. Therefore, the "optimal" grazing intensity proposed by the paper seems to justify the right balance between the interests of nature conservation and agriculture.

Stăncioiu, P. T., Niță, M. D., & Lazăr, G. E. (2018). Forestland connectivity in Romania—Implications for policy and management. Land Use Policy 76, 487-499.

Geographical coverage	☐ International level ☐ Eu level X National level ☐ Local level
Main topics covered	Forest ecosystem and connectivity
Evaluation questions and evaluation criteria addressed	X *E.Q.1 - To what extent has the NRDP contributed to habitat conservation?* X NRDP contribution to habitat conservation E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? ☐ NRDP contribution to services related to water quality ☐ NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to habitat conservation</u> The study analyses the connectivity of forests in Romania. Results show that despite the large number of forest fragments making up the 7.142.203,87 ha of forest vegetation in Romania, a large proportion of them (about 85%) had areas large enough to ensure the long-term survival of forest tree populations. These results confirm that management policies and guidelines inherited from the past provide good conditions for connectivity of the main forest tree species and for forests in general. Enforced by the state on all forests regardless of ownership (despite the fact that they reduce economic efficiency), the regulations ensure the growing space conditions across the forested landscapes, outside of the existing protected areas, providing the key support for the high biodiversity present at large scales in Romania. Therefore, the continuous enforcement of these key rules would perpetuate the actual forest area with all subsequent advantages for humans and wildlife. However, although the control capacity of the state over forest management has improved in recent years, the lack of financial incentives to compensate the losses incurred due to the imposed measures and therefore to support a sustainable management of private forests (especially in the case of small ownerships – less than 10 ha) still poses an important threat to the maintenance of a favourable context for connectivity and conservation. Agricultural policies should be adjusted to specifically address the needs for connectivity as well. However, as private ownership today covers a large share of the forestland and most of the agricultural lands, sound land use policies

	must include incentives for owners to continue managing their resources for both production and biodiversity. Such incentives are essential for ensuring the habitat conditions for diverse species of flora and fauna at present.

Emmerson, M., Morales, M.B., Oñate, J.J., Batáry, P., Berendse, F., Liira, J., Aavik, T., Guerrero, I., Bommarco, R., Eggers, S. și Pärt, T., 2016. How agricultural intensification affects biodiversity and ecosystem services. Progresses in Ecological Research (Vol. 55, pp. 43-97). Academic Press

Geographical coverage	International level X Eu level National level Local level
Main topics covered	Biodiversity and ecosystem degradation due to agricultural intensification
Evaluation questions and evaluation criteria addressed	X *E.Q.1 - To what extent has the NRDP contributed to habitat conservation?* X NRDP contribution to habitat conservation X *E.Q.2 - To what extent has NRDP contributed to the provision of environmental services?* ☐ NRDP contribution to services related to water quality X NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to habitat conservation</u> The paper analyses the biodiversity loss in the EU due to the intensification of agriculture, driven by the CAP, that promotes the simplification and specialization of agroecosystems. The article states that plants, insects and especially birds have all declined in European farmland at the community and landscape level. More than one half (250 species) of European bird species, of which 50% are either threatened or have suffered steep population declines. The article present the results of the AGRIPOPES pan-European research project (AGRIcultural POlicy-Induced landscaPe changes: effects on biodiversity and Ecosystem Services), focused on quantifying agricultural policy-induced landscape changes and their effects on taxonomic and functional diversity taxonomic and functional biodiversity of key taxa (birds, Carabidae beetles, arable plants) and the associated results of biological pest control. The paper focused on the three processes that drive to biodiversity loss through Agriculture Intensification: (1) increased use of farm chemicals, like fertilizers, herbicides and pesticides; (2) mechanization and crop and husbandry specialization and (3) simplification of farmed landscapes leading to loss of landscape diversity. Results show negative relationships between the application of pesticides and the various components of biodiversity studied on a pan-European scale. Finally, agriculture intensification clearly had negative relationships regarding plant and bird diversity. <u>NRDP contribution on services related to soil quality</u>

	2003 reform of the CAP removed the link between the receipt of a direct payment and the production of a specific commodity (known as 'decoupling'). These reforms also introduced cross-compliance', as a series of rules that the farmer had to respect in order to benefit from direct payments. These rules are related to the environment, as for example for the protection of natural resources. Crop and livestock specialization, increased synthetic inputs and soil disrupting operations (ploughing, refining) or removal of semi-natural elements and landscape features are all components acting on the natural landscape and which have interacted jointly to modify the agricultural ecosystems of Europe over the last decades, leading to soil errosion and affecting soil organisms. Field ploughing and other mechanical operations cause soil disruption, thus becoming a source of disturbance for plants growing in fields. Ploughing was the traditional technique used to eliminate weeds until the use of herbicides was generalized. In regions where 1 year rotation is still frequent, it continues to be the dominant procedure of weed control.

Torralba, M., Fagerholm, N., Burgess, P.J., Moreno, G., Plieninger, T. (2016). Do European agroforestry systems enhance biodiversity and ecosystem services? A meta-analysis. Agriculture, Ecosystems and Environment 230: 150-161

Geographical coverage	International level X Eu level National level Local level
Main topics covered	Agroforestry systems
Evaluation questions and evaluation criteria addressed	X *E.Q.1 - To what extent has the NRDP contributed to habitat conservation?* X NRDP contribution to habitat conservation E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? ☐ NRDP contribution to services related to water quality ☐ NRDP contribution to services related to soil quality *X E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change?* ☐ Contribution of forestry measures to climate change mitigation and adaptation X Contribution of measures applicable on agricultural land to climate change mitigation and adaptation *X E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas?* X NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to habitat conservation</u> The study analyses the practice of agroforestry, as the practice of deliberately integrating woody vegetation (trees or shrubs) with crop and/or animal breeding systems to benefit from the resulting ecological and economic interactions. Concerning habitat conservation, the results shows that agroforestry had a significant positive effect on agroforestry systems and on biodiversity (birds, plants, dung and insects), meaning that species richness and abundance were higher in agroforestry systems than in specific agricultural and forestry systems (g = 0.874; 95% confidence interval = 0.532 to 1.215). When compared to conventional land

	uses such as grassland, arable land, or forests, agroforestry practice supports higher levels of biodiversity, providing food, shelter, habitat, and other resources for multiple species. The benefits of agroforestry practice differ among the studied taxa, with a strongly positive effect for bird communities. Among the woody species used in European agroforestry practice, olive trees, followed by chestnut, walnuts and cherry species had highly significant positive effects. Conifers were the only group that displayed a strong negative effect, whilst species such as poplar, willow, and ash showed negative but non-significant effects. The meta-analysis also stresses the importance of promoting features and practices that act at a landscape scale, as in the case of hedgerows, which play an important role in landscape-scale biodiversity conservation. NRDP contribution to sustainable development in rural areas Agroforestry practice has also been found to improve regulating ecosystem services such as nutrient retention and erosion control, as well as improving the recreational, aesthetic, and cultural heritage value. The contribution of measures applicable on agricultural land to climate change mitigation and adaptation Agroforestry practice can also improve carbon sequestration, pollination, pest control and fire risk reduction. Lorenz and Lal (2014) described the role of agroforestry systems in soil carbon sequestration estimating that agroforestry might may be sequestering up to 2.2 mg of Carbon above and belowground for 50 years.

Kelly Garbach, Jeffrey C. Milder, Fabrice A.J. DeClerck, Maywa Montenegro de Wit, Laura Driscoll & Barbara Gemmill-Herren (2016): Examining multi-functionality for crop yield and ecosystem services in five systems of agroecological intensification, International Journal of Agricultural Sustainability, DOI: 10.1080/14735903.2016.1174810

Geographical coverage	International level X Eu level National level Local level
Main topics covered	Biodiversity and ecosystem degradation due to agricultural intensification
Evaluation questions and evaluation criteria addressed	X *E.Q.1 - To what extent has the NRDP contributed to habitat conservation?* X NRDP contribution to habitat conservation X *E.Q.2 - To what extent has NRDP contributed to the provision of environmental services?* X NRDP contribution to services related to water quality X NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	NRDP contribution to habitat conservation

	The paper analyses the Agroecological intensification (AEI), as the management approach that integrates ecological principles and biodiversity management into farming systems with the aim of increasing farm productivity, reducing dependency on external inputs, and sustaining or enhancing ecosystem services. Concerning habitat conservation, results show that win–win outcomes in holistic grazing management systems were associated with biodiversity and habitat provision. These included significantly increased cattle production, measured as stocking density (e.g. livestock stocking rate standardized for grazing time, area), associated with greater biomass of riparian vegetation and input of terrestrial invertebrates that were two to three times greater in streams with riparian zones under high-intensity. The conservation agriculture increased abundance of soil macroinvertebrates in crop areas an of beneficial birds and organic agriculture increased species richness of nematodes, ground beetles and pollinators. NRDP contribution on services related to water quality Agroecological intensification (AEI) consists in agroecological principles of optimizing use of water. Intercropping or cover cropping with nitrogen fixing legumes can reduce or eliminate the need for fertilizers. With respect to nutrient retention, rotational grazing reduced phosphorus loads to surface water relative to continuous cattle grazing at similar stocking rates. Precision irrigation resulted in a 15% water savings versus uniform irrigation while eliminating puddle formation and enhancing overall field productivity in pivot-irrigated potato crops. Studies reporting enhanced ecosystem services and similar yield for precision agriculture versus contrasting farming systems also emphasized water flow regulation. Significantly enhanced water-use efficiency was achieved without diminishing crop yield through precision laser levelling, zero-till (Jat et al., 2009). Neutral outcomes, with no significant differences relative to the contrasting farming system, included similar dryland corn yield with little benefit for water flow regulation under precision technology. System of rice intensification (SRI) enhanced rice yield and water flow regulation, often measured as water savings relative to continuous flooding. NRDP contribution on services related to soil quality The article shows many approaches, which enhance soil productivity. Conservation agriculture includes leguminous plants, which can enhance biological nitrogen fixation and help to maintain vegetative soil cover. Holistic grazing management which supported greater sheep production, also resulted in greater numbers of soil microbes classified as heterotrophs, nitrifiers, and denitrifiers; functional groups that supported greater soil enzyme activity, which enhanced nitrification and nitrogen cycling relative to less intensive management. Organic agriculture increased organic cotton yield paired with enhanced soil carbon (Blaise, 2006); greater grain production, paired with enhanced soil nitrogen and biomass; greater soil water-holding capacity in organic treatments during years of extreme drought. Comparisons between organic farming and conventional practices were often characterized by significant trade-offs between reduced yield but increased availability of ecosystem services, including lower cereal grain yields but higher availability of soil macronutrients and enhanced soil microbial activities. Enhanced levels of ecosystem services in organic systems were reported for services benefitting both on- and off-farm beneficiaries. On-farm benefits included significantly enhanced soil structure and fertility in diverse crops including organically managed apples, and grains. Measures of significantly enhanced soil-related services included increased functional diversity of soil microbes, increased microbial activity, and enhanced colonization by mycorrhizal fungi. System of rice intensification (SRI) reports significantly enhanced yield with soil structure and fertility enhancement.

EVALUAREA ON-GOING A PNDR 2014-2020 ÎN PERIOADA 2017-2020

Malek, Ž., Zumpano, V., & Hussin, H. 2018. Forest management and future changes to ecosystem services in the Romanian Carpathians. Environment, Development and Sustainability, 20(3), 1275-1291

Geographical coverage	Local level (Romanian Carpathians)
Main topics covered	Mountain ecosystems and biodiversity
Evaluation questions and evaluation criteria addressed	X *E.Q.1 - To what extent has the NRDP contributed to habitat conservation?* X NRDP contribution to habitat conservation X *E.Q.2 - To what extent has NRDP contributed to the provision of environmental services?* X NRDP contribution to services related to water quality X NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to habitat conservation</u> The study analyses the consequences of future changes to the provision of ecosystem services (ES) in the Romanian Carpathians, by comparing 2040 forest management scenarios and analyzing potential changes to biodiversity support and landslide regulation by comparing future forest cover change scenarios with the existing forest cover. Concerning habitat conservation, the article highlights that Carpathian ecosystems are thus among the most vulnerable to anthropogenic change, also due to severe natural conditions, particularly the Buzau Subcarpathians, which is a landslide-prone area that experienced significant socioeconomic changes in the last decades. The Buzau Subcarpathians serve as a refuge for important European habitats within the Romanian Carpathians, as for the European large carnivores such as the wolf (Canis lupus) and the brown bear (Ursus arctos). Increased human pressure in a previously less human dominated landscape can negatively affect these habitats and limit the area's potential for large mammal conservation and biodiversity protection in general. Two spatially explicit forest cover change scenarios for 2040 were developed. The scenarios focused on two forest transitions: forest expansion and deforestation. The model estimated the amount of deforested/reforested areas based on two different assumptions on future forest management in Romania. Taking into account changes to forest management (and the allowed timber harvesting and deforestation), the business as usual (BAU) and alternative (ALT) scenario was developed. The BAU scenario assumed that the current forestry legislation of Romania will be followed and sufficiently implemented. The alternative scenario differs in terms of a higher rate of wood harvesting, as well as an increased share of clear-cutting to enable less costly harvesting. The business scenario results as usual in a 8% lower loss of landslide regulation potential compared to the alternative scenario. It also results in a 29% higher regional net gain of landslide regulation potential. The alternative scenario projected a 66.7% higher deforestation compared to the business as usual scenario. Both scenarios result in the loss of biodiversity support due to their prevalent transition of forest expansion.

	NRDP contribution on services related to soil quality; NRDP contribution on services related to water quality The articles states that healthy vegetation cover can affect slope stability through erosion control and water regulation. Reforestation has the ability to increase slope stability and can be considered as a landslide risk reduction or soil and water conservation measure.

Maseyk, F.J.F., Demeter, L., Csergő, A.M., Buckley, Y. M. Effect of management on natural capital stocks underlying ecosystem service provision: a 'provider group' approach. Biodivers Conservation (2017) 26: 3289.

Geographical coverage	X Local level (grasslands of Southeastern Carpathians)
Main topics covered	Land management practices and biodiversity
Evaluation questions and evaluation criteria addressed	X *E.Q.1 - To what extent has the NRDP contributed to habitat conservation?* X NRDP contribution to habitat conservation E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? ☐ NRDP contribution to services related to water quality ☐ NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	NRDP contribution to habitat conservation The study analyses how the land management practices (abandonment of mowing, grazing, and mowing)) directly impact on the occurrence and condition of natural capital stocks, measured using species diversity and abundance metrics. In particular, they grouped grassland plant species into six groups according to desirable attributes (palatability and nutritional value to livestock; medicinal or aromatic compounds; nectar production; pollen production; nitrogen fixation; and endemic and red listed species). The results show that all three management practices favoured at least one provider group, but hay making in upland grasslands favoured more provider groups than abandonment of mowing or grazing. The effects of management on diversity and abundance within several provider groups diverged from the effects on overall species diversity and abundance. They suggest that a mixed-management regime will be required to sustain multifunctional landscapes.

Miguel A. Altieri, Clara I. Nicholls and Rene Montalba. Technological Approaches to Sustainable Agriculture at a Crossroads: an agroecological perspective. Sustainability 9, no. 3 (2017): 349.

Geographical coverage	International level
Main topics covered	Positive effect of agroecology on natural resources
Evaluation questions and evaluation criteria addressed	X *E.Q.1 - To what extent has the NRDP contributed to habitat conservation?* X NRDP contribution to habitat conservation X *E.Q.2 - To what extent has NRDP contributed to the provision of environmental services?* ☐ NRDP contribution to services related to water quality X NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to habitat conservation</u> The study analyses the beneficial effects of agroecology. According to the article, traditional farming systems allows to maintain the ecological interactions among plant, animal and soil components, which promote key processes such as nutrient cycling, pest regulation and crop productivity. These systems exhibit a lower incidence of insect pests and plant diseases. Intercropping is an effective agroecological strategy of introducing more biodiversity into agroecosystems. Rice-Fish-Duck Systems support a variety of beneficial interactions: the various species of fish (Tilapia nilotica and Cyprinus carpio) consume insect pests (mainly leaf hoppers and leaf rollers) that attack the rice plant as well as weeds that choke rice plants and rice leaves infected by sheath blight disease thus reducing the need for pesticides. <u>NRDP contribution on services related to soil quality</u> Legumes intercropped with cereals is a key diversification strategy, not only because of their provision of nitrogen, but also because the mixtures enhance soil cover, smother weeds and increase nutrients (e.g., potassium, calcium and magnesium) in the soil through the addition of biomass and residues to the soil. Such intercropping systems also increase soil microbial diversity such as vesicular arbuscular mycorrhizae (VAM) fungi which facilitate phosphorous transfer to the crops and enhance crops water use efficiency. Cover crops build vertical soil structure as they promote deep macropores in the soil, which allow more water to penetrate during the winter months and thus improve soil water storage. Farmers' observations in southern Brazil suggest that cover crops can enhance weed suppression and hence crop productivity possibly through allelopathy and via a host of effects on soil quality and fertility and soil moisture.

Moudrý, J., Bernas, J., Konvalina, P., Ujj, A., Manolov, I., Stoeva, A., Rembiałkowska, E., Stalenga, J., Toncea, I., Fitiu, A. and Bucur, D., 2018. Agroecology Development in Eastern Europe—Cases in Czech Republic, Bulgaria, Hungary, Poland, Romania, and Slovakia. Sustainability 10(5), p.1311

Geographical coverage	EU level National level
Main topics covered	Agroecology againts intensive agriculture
Evaluation questions and evaluation criteria addressed	E.Q.1 - To what extent has the NRDP contributed to habitat conservation? ☐ NRDP contribution to habitat conservation E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? ☐ NRDP contribution to services related to water quality ☐ NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas X NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to the promotion of traditional agricultural practices</u> The study analyses the beneficial effects of agroecology, the holistic study of agroecosystems, including all of their environmental and human elements. It deals with relationships among plants, animals, microorganisms, and agricultural soil, as well as its relationships to these organisms in the landscape. According to the article, it is thus more necessary to implement the principles of agroecology in practice and mitigate the impact of intensive agriculture, which is oriented almost exclusively on economic efficiency. The conservative approach of a significant part of farmers that still hinders their relationship with nature, especially in production areas, and technical, technological, and biotechnological progress has been more focused on the production side of agriculture and its intensification rather than on compatibility with agroecology, although it can be well used to fulfill its principles. Firmly establishing agroecosystem features and their indicators is a crucial aspect of investigation for evaluating and anticipating solutions for farm design and management, as well as land use policies; Developing basic standards of agroecology is the main tool for the implementation of agroecology in practice. Contemporary agroecology has thus gradually developed a number of theoretical schools in the world, and in practice, it helps to develop agricultural systems to meet the principles of long-term sustainability, as presented in its definition in 1993 by FAO-UNESCO.

Popescu, G. C. (2018). THE IMPLEMENTATION OF AGRICULTURAL PRACTICES BENEFICIAL FOR THE CLIMATE AND THE ENVIRONMENT PROMOTED BY CAP 2014–2010: A CASE STUDY IN MEDIUM-SIZE ROMANIAN AGRICULTURAL HOLDING. Current Trends in Natural Sciences Vol, 7(14), 107-114

Geographical coverage	Local level (Olt county)
Main topics covered	Crop diversification
Evaluation questions and evaluation criteria addressed	E.Q.1 - To what extent has the NRDP contributed to habitat conservation? ☐ NRDP contribution to habitat conservation X E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? X NRDP contribution to services related to water quality X NRDP contribution to services related to soil quality X E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation X Contribution of measures applicable on agricultural land to climate change mitigation and adaptation X E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? X NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to sustainable development in rural areas</u> The study evaluates the implementation of agricultural practices beneficial for the climate and the environment in a medium-size Romanian agricultural holding. The case study was carried out in a private medium – size farm with the main activity represented by cereals crops from Olt county located in southern Romania. According to the article, Ecological Focus Areas (EFAs) are an important instrument to enhancing the ecological function of agricultural landscapes and to improve the biodiversity. Ecological Focus Areas on the agricultural holding were represented by green peas culture (nitrogen-fixing crops). Requirement for Crop Diversification and Ecological Focus Areas (EFAs) can be considered to access greening payments for agricultural practices beneficial for the climate and the environment. The implementation of good agricultural and environmental farming practices within the agricultural holding has brought economic and environmental benefits, with an increment of agricultural productivity. <u>NRDP contribution to services related to water quality; NRDP contribution to services related to soil quality</u> Crop diversification in the agricultural holding is the growing of a number of different crops. It enhances agricultural and landscape biodiversity and may improve soil organic matter by: reducing soil erosion, and improving water quality. <u>Contribution of measures applicable on agricultural land to climate change mitigation and adaptation</u> Crop diversification may reduce the effects of climate change, in order to adopt and maintain farming practices that help meet environment and climate goal promoted by the actual European Common Agricultural Policy.

EVALUAREA ON-GOING A PNDR 2014-2020 ÎN PERIOADA 2017-2020

B. Grizzetti, C. Liquete, P. Antunes, L. Carvalho, N. Geamănă, R. Giucă, M. Leone, S. McConnell, E. Preda, R. Santos, F. Turkelboom, A. Vădineanu, H. Woods, Ecosystem services for water policy: Insights across Europe Environmental Science & Policy, Volume 66, 2016, Pages 179-190

Geographical coverage	EU level Local level (Lower Danube)
Main topics covered	Water management policies
Evaluation questions and evaluation criteria addressed	E.Q.1 - To what extent has the NRDP contributed to habitat conservation? ☐ NRDP contribution to habitat conservation X E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? X NRDP contribution to services related to water quality ☐ NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to services related to water quality</u> The article presents the result of case studies carried out across Europe, as for example in the River Basin District of the Danube river, showing how the watershed management units are structured, as well as the involvement of stakeholders through the River Basin Committee (RBC). The article highlights that reference to ecosystem services in the regional management plan was generally absent in the first cycle of the River Basin Management Plans, and that it has started to appear in the second cycle, because pf the influence of strategic documents at the European level, in particular the Biodiversity Strategy (European Commission, 2011), the Climate Adaptation (European Commission, 2009) and the Blueprint to safeguard Europe's water resources (European Commission, 2012a), which explicitly refer to ecosystem services. The analysis of the supranational management plan for entire Danube River District shows that water uses and services, like water abstraction (industry, irrigation, household supply), drinking water supply, wastewater discharge (municipalities, industry), Hydropower generation, navigation, dredging and gravel exploitation, recreation, are important characteristics of the Danube River Basin District. Also, it is recognized that “wetlands/floodplains and their connection to adjacent river water bodies play an important role in the functioning of aquatic ecosystems by providing important habitats for fish as well as other fauna and have a positive effect on their water status. Connected wetlands/floodplains play a significant role when it comes to retention areas during flood events and may also have positive effects on the reduction of nutrients”. Most of stakeholders for water management consulted in this study across Europe think that the ecosystem services approach can be useful for the River Basin Management Plans, especially to integrate policies, to identify synergies and trade-offs, to foster a holistic and sustainable view of the water issues and to drive attention to human benefits from conserving nature.

Andrei Jean Vasile, Cristian Popescu, Raluca Andreea Ion, Iuliana Dobre, From conventional to organic in Romanian agriculture – Impact assessment of a land use changing paradigm, Land Use Policy, Volume 46, 2015, Pages 258-266

Geographical coverage	Local level (North-West part of Romania - Satu-Mare County)
Main topics covered	Organic vs. conventional land use
Evaluation questions and evaluation criteria addressed	E.Q.1 - To what extent has the NRDP contributed to habitat conservation? ☐ NRDP contribution to habitat conservation X E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? ☐ NRDP contribution to services related to water quality X NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? X NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to sustainable development in rural areas</u> The study analyses organic vs. conventional land use with respect to one case study carried out in North-West Romania, to a farm of 450 ha of cereals: wheat, corn, sunflower and soy-beans. The articles states that CAP and inland financial support has a major impact in increasing the organic agriculture potential, in attracting new producers and conversing classical agricultural areas to organic ones. Organic farming has the potential to increase net returns, reduce the risks of crop failure and reduce environmental impacts. <u>NRDP contribution to services related to soil quality</u> The study indicates that the economic efficiency is slightly higher in organic system compared to conventional (the conversion of the 5, 10 and 20 ha of conventional into organic one using wheat crop drives to increasing farm's economic efficiency, expressed by the rate of profit – the growth is higher by 0.8% for 5 ha of organic wheat, respectively 0.9% and 1% for 10 ha and 20 ha). The attractiveness of the sector made farmers to convert part of their land to organic farming. In fact, the number of firms registered in organic agriculture in Romania sharply increased from 2006 to 2012, from 3409 operators to 15,544 operators (55.5 times). The area under organic agriculture cultivated with arable crops increased 3.8 times from 2006 to 2012, from 45,605 ha to 174,644 ha. Pastures and hayfields under organic farming doubled in the period analyzed, from 51,200 ha to 105,835 ha. The total area under pastures and hayfields is 4,831,200 ha (NIS, 2012), the organic system accounting for 2.2%. The area under organic farming with orchards and vineyards increased from 294 ha in 2006 to 7781 ha in 2012 (26 times). The total area under orchards and vineyards is 407,400 ha, organic system representing 1.9%.

Sorina-Mihaela Bogdan, Ileana Pătru-Stupariu, Liliana Zaharia, The Assessment of Regulatory Ecosystem Services: The Case of the Sediment Retention Service in a Mountain Landscape in the Southern Romanian Carpathians, Procedia Environmental Sciences, Volume 32, 2016, Pages 12-27

Geographical coverage	Local level (Iezer Mountains - Southern Carpathians)
Main topics covered	Sediment retention service
Evaluation questions and evaluation criteria addressed	E.Q.1 - To what extent has the NRDP contributed to habitat conservation? ☐ NRDP contribution to habitat conservation X E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? ☐ NRDP contribution to services related to water quality X NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to services related to soil quality</u> The article analyses the capacity of the area analysed to guarantee the sediment retention service. The case study is carried out in the Iezer Mountains of the Southern Carpathians and it is part of the upper Râul Târgului catchment, particularly focusing on the sediment retention capacity of the following rivers: Râușor, Bătrâna, Cuca and Râul Târgului. On the entire study area, the analysis shows an increase of 75.5 tons/year in sediment exported, a decrease of 75.6 tons/year in sediment retained and an increase of 3805.34 tons/year in potential soil loss. The increase in potential soil loss relates with the loss of forest cover on some of the slopes directly above the reservoir, and also to the intensification of the forestry roads network used to clear the windthrow affected areas. The comparative analysis of land cover scenarios between 2005 and 2012 shows decreases in grassland (by 1.5%), high and medium density forest (by 3% and 3.4%) covers in favor of subalpine vegetation (increase of 2.58%), low density forest (increase of 22.56%), degraded forest (increase of 188.8%), and artificial land cover (increase in roads of 49.9% and built-up of 69.8%). Reported to the entire study area, only 2.76 % changed its land area (326.33 ha). 51 % of this change is from high density forest to degraded forest (165.72 ha) and 15 % from medium density forest to degraded. The next three changes, with approximately 5 % of the total changes are grasslands to subalpine or low density forest and low density to degraded forest.

Victor Platon, Simona Frone, Andreea Constantinescu, New Developments in Assessing Forest Ecosystem Services in Romania, Procedia Economics and Finance, Volume 22, 2015, Pages 45-54

Geographical coverage	National level
Main topics covered	Organic vs. conventional land use
Evaluation questions and evaluation criteria addressed	E.Q.1 - To what extent has the NRDP contributed to habitat conservation? ☐ NRDP contribution to habitat conservation X E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? X NRDP contribution to services related to water quality X NRDP contribution to services related to soil quality X E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? X Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to services related to soil quality</u> Forests have played a key role in the accumulation of basement large deposits of coal in the Carboniferous period (350-280 Million years BC.) Forests strengthens disaggregated land and prevents movements, slumping, formation of sinkholes, bogged down valleys; forest fixes flying sands; forest prevents solar heat from reaching the soil and drying it; forest soil is more moist than the land discovered nearby. Therefore, "the forest had a senior role in formation of at least 75% of Romanian soils". <u>NRDP contribution to services related to water quality</u> Forest favors the formation of springs and ensures a constant and regular flow rate. To perform this function, hydroelectric river basins of interest should be as well as possible forested. Forest regulates flow rate, removing the extremes, due to fixing a considerable amount of water in the soil and allow surplus to flow, thus water flow becomes slower. Moreover, the forest is the strongest barrier against erosion, and accounted the best and most effective way to prevent floods. <u>Contribution of forestry measures to climate change mitigation and adaptation</u> At local level, the forest has a similar effect with the proximity of the sea: diminish high temperatures in summer and upgrades cold ones in winter, reduce the maximum temperature and increases the minimum level. Forest purify the atmosphere; fixes carbon dioxide from the air and renders the necessary oxygen for breathing; in softwood forests is added air and ozone enrichment caused by resin trees. The air in these forests is best for human diseases followed by a long-convalescence. Carbon dioxide, the main greenhouse gas, can be retained through the process of photosynthesis by the plant mass of forest and vegetation on other land, process which in climate change is called carbon storage. Climate change researchers found that forests constitute the most powerful natural CO2 storage for long periods of time, but the amount stored decreases from year to year due to, in particular, massive deforestation. If CO2 is captured, it can be stored or reused with economic benefits.

Linnell, J. D. C. & Kaltenborn, B. P. (2016) An ecosystem services analysis of the Fagaras Mountains, Romania – NINA report 1251. 37 pp

Geographical coverage	Local level (Fagaras Mountains, Romania)
Main topics covered	economic value of Romanian forests and ecosystem services
Evaluation questions and evaluation criteria addressed	E.Q.1 - To what extent has the NRDP contributed to habitat conservation? ☐ NRDP contribution to habitat conservation X E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? X NRDP contribution to services related to water quality ☐ NRDP contribution to services related to soil quality X E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? X Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? X NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices X NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>Contribution of forestry measures to climate change mitigation and adaptation</u> The forests of the Carpathians are a carbon sink with considerable potential to store greater amounts of carbon. The ongoing trends to establish economic mechanisms for carbon trading have the potential to create income sources from forests without the need to cut trees. <u>NRDP contribution to services related to water quality</u> High forest cover, especially along stream and river banks is likely to be essential for (1) slowing evaporation loss and enhancing the proportion of water that becomes ground water, (2) slowing run-off following precipitation to protect against floods and create a more even flow, (3) improving water clarity in streams and rivers, improving their ability to house biodiversity, and increasing the quality for human and agricultural use, as well as reducing silt which causes erosion in hydro-electric turbines <u>NRDP contribution to sustainable development in rural areas</u>: According to the article, the Fagaras Mountains have the potential to deliver multiple ecosystem services to the rural communities that surround them in a way that can provide a solid foundation for rural development. It is possible to see multiple ways that these can be managed such that they favour sustainable development and take care of some of the unique natural values of the region. The article presents three contrasting scenarios to illustrate alternative development paths: Scenario 1: Intensive use of provisioning resources (timber, energy and livestock product production but at the same time a dramatic loss of the areas ability to provide regulatory (carbon storage, water quality) and cultural services). Scenario 2: Sustainable and extensive multi-use that consists in selecting methods to produce timber, over-grazing prevention and quota setting for hunting, with the maintenance of the tourism and existing biodiversity values, by losting at the same time the wilderness values. Scenario 3: Wilderness which leads to conservation of specific biodiversity components (species and habitats associated with forest) and ecological

	processes (with minimal anthropogenic influence), enhancing the moral and aesthetic values associated with this specific form of landscape and ecological state. Otherwise, it would lead to declines in biodiversity components associated with grazing dependent (alpine pastures) and management dependent (hay meadows) grasslands, and in the decline of the cultural heritage values. NRDP contribution to reduce the risk of abandonment of agricultural activities: The region is still undergoing many of the changes that started with the post-socialistic transition from 1989 and EU succession in 2007. These changes have led to factory closure, changes in agricultural subsidy and rural support structures, and a resultant out-migration of rural people to urban areas and overseas. The result is an ageing of the rural population and a loss of the young and dynamic age groups. As such, the region, especially the southern part, is suffused with a sense of decline and hopelessness. Some grounds for optimism were evident, however. There are signs that corruption is being addressed on a political level, the era of massive illegal clear cutting seems to be ending, some of the diaspora are returning and bringing back new ideas and savings with them in search of investment opportunities, and there is a widespread feeling among local people that something needs to be done to turn the region's fortunes around and potential support for less destructive and more sustainable development paths.

Fagerholm, Nora, Mario Torralba, Paul J. Burgess, and Tobias Plieninger. A systematic map of ecosystem services assessments around European agroforestry. Ecological Indicators 62 (2016): 47-65;

Geographical coverage	EU level
Main topics covered	ecosystem services assessments
Evaluation questions and evaluation criteria addressed	E.Q.1 - To what extent has the NRDP contributed to habitat conservation? ☐ NRDP contribution to habitat conservation E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? ☐ NRDP contribution to services related to water quality ☐ NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation X E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas X NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	NRDP contribution to promote traditional agricultural practices The article addresses some issues related to agroforestry. The results show that ecosystem service assessment of European agroforestry is currently focused on the spatially extensive wood pastures in the Mediterranean, Atlantic, and Continental agricultural mosaic landscapes. A specific emphasis has been on regulating, supporting, and provisioning services, such as provision of habitat and biodiversity, food, climate regulation, fibre, and fuel, and the consideration of cultural services has been largely limited to aesthetic value. There is a bias to biophysical and monetary research approaches. The majority of the studies focus on quantitative methods and

	biophysical field measurements addressing the assessment of only one or two services. Monetary approaches have been applied in less than one fifth of the studies but form a distinctive group. Research should aim to diversify from the biophysical and monetary approaches, towards a wider variety of approaches, especially socio-cultural, and a wider coverage of ecosystem services. Stronger consideration of stakeholder participation and introduction of spatially explicit mapping are also important key actions.

Platon V., Frone S., Constantinescu A., 2016, Challenges and innovations on the sustainable forest management in Romania; virgin forests as heritage, la conferința internațională a proiectului MIS ECT 2617 ALECTOR "Caring and Sharing. The Heritage Environment as an Agent for Change" 31st May-2nd of June 2016, Istanbul

Geographical coverage	National level
Main topics covered	Virgin forests
Evaluation questions and evaluation criteria addressed	X *E.Q.1 - To what extent has the NRDP contributed to habitat conservation?* X NRDP contribution to habitat conservation E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? ☐ NRDP contribution to services related to water quality ☐ NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	NRDP contribution to habitat conservation Virgin forests are few remaining areas in which nature continues to survive in its pristine form, without the intervention of humans. These ecosystems are very stable providing habitat for more than 13,000 species of plants, animals and insects. Existing forest areas would be added the nominated primordial Romanian forests (Strâmbu Băiuț - Groșii Țiblesului in Maramureș county, and Șinca forest in the Fagăraș mountains). These forests are threatened by potential forest destruction through illegal logging and unsustainable exploiting. The most significant instruments for forest protection are represented by forests radar, long-term contracts for exploitation of forests, transparent forest management decisions, limiting logging etc. The main problem with virgin forests protection is that only 18% of them have some protected status by being included in protected areas. A smaller percentage and enjoys full protection. The rest, meaning more than 80% of all virgin forest in Romania, have no form of protection and are in danger of being legally destroyed. The article proposes two innovative tools for protection: the National Catalogue of Virgin and Quasi Virgin Forests, an online database with the purpose of maintaining records and ensuring the protection of these forests strictly, and the system of compensation for all forest owners throughout the country, to ensure they don't damage the forest they own.

Aceleanu, Mirela. (2016). Sustainability and Competitiveness of Romanian Farms through Organic Agriculture. Sustainability 8. 245. 10.3390/su8030245

Geographical coverage	National level
Main topics covered	Organic agriculture
Evaluation question and evaluation criteria addressed	E.Q.1 - To what extent has the NRDP contributed to habitat conservation? ☐ NRDP contribution to habitat conservation E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? ☐ NRDP contribution to services related to water quality ☐ NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation X E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? X NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	NRDP contribution to sustainable development in rural areas Organic farming is a very important field for ensuring sustainable development. Romania has great potential for the development of organic agriculture, especially due to the large number of available farmland and reduced use of fertilizers and other chemicals. However, the development of organic farming in Romania is in an early stage, due to the numerous problems that Romanian agriculture is still facing. Promoting organic agriculture through the use one of the measures that can be taken by Romanian farms is green marketing strategy development that can stimulate both consumption and production of organic products. Therefore, with increasing interest in the development of organic agriculture in Romania, green marketing can play an increasingly important role in promoting the benefits of consuming organic products, thus contributing to business development of organic products as well as to the development of Romanian agriculture

Hua Zheng, Yifeng Li, Brian E Robinson, Gang Liu, Dongchun Ma, Fengchun Wang, Fei Lu, Zhiyun Ouyang, Gretchen C Daily. Using ecosystem service trade-offs to inform water conservation policies and management practices. Front Ecol Environ 2016; 14 (10): 527– 532

Geographical coverage	International level
Main topics covered	Organic vs. conventional land use
Evaluation question and evaluation criteria addressed	E.Q.1 - To what extent has the NRDP contributed to habitat conservation? ☐ NRDP contribution to habitat conservation X E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? X NRDP contribution to services related to water quality ☐ NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to services related to water quality</u> The article compared ecosystem services in several land-use scenarios relative to actual land-use change over a 9-year period. These scenarios were developed in an effort to maintain agricultural production while improving water quality and increasing water quantity in the watershed of the Miyun Reservoir, the only source of surface water currently available for domestic use in Beijing, China. Within the watershed, from 2000 to 2009, forest cover and urban area increased by 33% and 280%, while water provision and water purification services declined by 9% and 27%, respectively. Under a hybrid scenario of agricultural expansion with riparian grassland buffers, three services – water provision, water purification, and sediment retention – as well as agricultural production all improved as compared with 2009 levels. Riparian grassland protection zones, seldom used in China, can effectively resolve trade-offs among multiple ecosystem services and are now being considered and implemented in several locations. Riparian zones are also important ecological corridors with many ecological functions, and certain regions are known for protecting them.

Lucas-Borja, M.E.; Zema, D.A.; Plaza-Álvarez, P.A.; Zupanc, V.; Baartman, J.; Sagra, J.; González-Romero, J.; Moya, D.; de las Heras, J. Effects of Different Land Uses (Abandoned Farmland, Intensive Agriculture and Forest) on Soil Hydrological Properties in Southern Spain. Water 2019, 11, 503

Geographical coverage	EU level
Main topics covered	effects of land use on soil water repellency (SWR) and soil hydraulic conductivity (SHC)
Evaluation question and evaluation criteria addressed	E.Q.1 - To what extent has the NRDP contributed to habitat conservation? ☐ NRDP contribution to habitat conservation X E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? ☐ NRDP contribution to services related to water quality X NRDP contribution to services related to soil quality E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation ☐ Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices ☐ NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to services related to soil quality</u> The article evaluates the effects of land uses on soil water repellency (SWR) and soil hydraulic conductivity (SHC) by direct measurements at the plot scale in three areas representing (1) intensive agricultural use, (2) abandoned farmland, and (3) a forest ecosystem in Southern Spain under Mediterranean climatic conditions. Forest soils showed high SWR and low SHC, while the reverse effects (that is, low SWR and high SHC) were detected in soils subjected to intensive agriculture, which may strongly affect the physico-chemical properties of soil, making it more prone to erosion and quality decay. Erosion problems have also been associated with land abandonment of both agricultural and marginal farmlands. In the soils previously subjected to agricultural activities, plant natural succession after land abandonment helps to avoid or reduce SWR, contributing to water penetration into the deeper soil layers, thanks to preferential flow paths via plant roots and stem flow. Furthermore, cultivation promotes rainfall infiltration, and, as a consequence, the runoff and erosion rates are significantly reduced. Forest soils showed -high water repellency and low infiltrability, which worsens their hydrological behavior under heavy and frequent storms typical of the Mediterranean landscape. Compared to the forestland and the abandoned land, the agricultural soils were less affected by water repellency and low infiltrability, presumably due to the periodical tillage operations.

Rareș Hălbac-Cotoară-Zamfir, Saskia Keesstra, Zahra Kalantari, The impact of political, socio- economic and cultural factors on implementing environment friendly techniques for sustainable land management and climate change mitigation in Romania, Science of The Total Environment, Total, Volume 654, 2019, Pages 418-429;

Geographical coverage	National level
Main topics covered	climate change mitigation
Evaluation question and evaluation criteria addressed	E.Q.1 - To what extent has the NRDP contributed to habitat conservation? ☐ NRDP contribution to habitat conservation X E.Q.2 - To what extent has NRDP contributed to the provision of environmental services? ☐ NRDP contribution to services related to water quality X NRDP contribution to services related to soil quality X E.Q.3 - To what extent has the NRDP support contributed to mitigation and adaptation to climate change? ☐ Contribution of forestry measures to climate change mitigation and adaptation X Contribution of measures applicable on agricultural land to climate change mitigation and adaptation E.Q.4 - To what extent has NRDP contributed to the sustainable development of the rural areas? ☐ NRDP contribution to sustainable development in rural areas ☐ NRDP contribution to promote traditional agricultural practices NRDP contribution to reduce the risk of abandonment of agricultural activities
Synthesis of the main findings	<u>NRDP contribution to services related to soil quality</u> Romania, until the beginning of 20th century, highlights the importance of forest belts (the first one covered with acacia plantations), that represent the basic strategy in stopping soil erosion and wind erosion of sands, and implemented them on large areas to protect agricultural land. Concerning soil protection, Environment friendly techniques (EFTs), defined as solutions for the use of land resources aiming the increasing of goods for meeting the changing human demands and with neutral or positive environmental impact, should be applied for soil erosion. Concerning vineyard digging, even though this practice is laborious work, requiring a large number of working hours, can help to achieve soil protection. In fact, digging out the lower part of vine stems in spring creates a series of low dikes, which play an important role in harvesting rainwater, mitigating surface runoff, increasing water infiltration, and offering protection against soil erosion, although this can be a risk to increase soil erosion in sloping terrain. Since summers can be very dry in the area in discussion, these dikes provide support in water harvesting for vineyards, providing an important water source considering the lack of other resources in the immediate vicinity. <u>Contribution of measures applicable on agricultural land to climate change mitigation and adaptation</u> Implementing sustainable land management (SLM) and identifying viable solutions to respond to the effects of climate change, Environment friendly techniques (EFTs) and Nature-based solutions (NBSs) represent useful tools for coping with climate change effects and given the political, socio-economic, and cultural context in Romania, EFTs, SLM and NBSs projects should be based on a well-balanced, clear, widely accepted, and implementable set of principles: i) embrace nature conservation norms; ii) can be implemented alone or in an integrated manner with other solutions to societal challenges; iii) maintain biological and cultural diversity

	and the ability of ecosystems to evolve over time; iv) NBSs should be perceived both as opportunities and challenges and should be implemented in an integrated approach based on a very good understanding of ecosystem processes, stakeholder engagement, and inclusion of societal considerations.

A.6 Data on the number of beneficiaries and the area employed under the environmental and climate measures (end of 2019)

Measure	Measure/sub-measure/package	Beneficiaries					Surface					Financial allocation (AIR 2018)
		2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	
M08	M8				27	45 (Sessions 1, 2 and 3)				324.30	595,91 (Sessions 1, 2 and 3)	126,801,632.00
M10 (total)		19,170	34,951	47,127	68,660	68,666	242,658.04	405,272.55	586,713.83	862,648.69	953,921.27	1,069,002,274.00
	P1	17,621	32,307	42,713	57,845	61,927	151,802.00	254,120.86	345,421.33	500,471.57	548,003.84	
	P2	11,365	22,068	27,545	41,346	40,644	27,365.00	47,712.60	63,893.51	110,458.00	110,458.37	
	P3	773	1,549	2,340	3,299	3,696	19,197.00	32,422.57	48,098.10	74,627.14	89,364.00	
	P4	590	961	1,735	2,099	2,121	30,690.04	46,504.29	81,707.25	114,305.40	125,822.81	
	P6	64	102	227	364	496	897.00	1,340.45	2,740.29	4,694.79	6,274.01	
	P7	217	320	538	669	837	12,707.00	23,171.78	44,853.35	57,043.57	72,815.61	
	P9	-	-	-	29	42	-	-	-	830.71	898.01	
	P10	-	-	-	3	2	-	-	-	50.51	116.90	
	P11	-	-	-	7	7	-	-	-	167.00	167.72	
M11 (total)		2,651	3,316	3,848	4,914	6,576	34,791.42	74,189.46	117,651.03	218,113.67	304,477.39	235,716,228.00
	sM 11.1	1,911	2,100	2,626	3,776	5,823	18,532.92	32,154.99	47,540.80	104,465.76	155,114.94	
	sM 11.2	2,532	3,619	4,107	4,755	6,134	16,258.50	42,034.47	70,110.23	113,647.91	149,362.45	
M13 (total)		412,228	398,506	393,530	388,109	383,100	4,916,145.75	4,926,062.42	5,041,784.81	5,132,177.39	5,272,382.76	1,317,643,914.00
	SMN	187,697	179,675	174,857	171,806	168,977	3,569,894.99	3,592,551.23	3,673,565.14	3,753,235.98	3,873,085.44	
	SPE	2,710	2,818	2,848	2,868	2,809	140,397.81	140,959.38	144,553.32	144,151.62	149,190.14	
	ZM	224,053	218,165	218,005	215,533	213,482	1,205,852.95	1,192,551.81	1,223,666.35	1,234,789.79	1,250,107.18	

EVALUAREA ON-GOING A PNDR 2014-2020 ÎN PERIOADA 2017-2020

Measure	Measure/sub-measure/package	Beneficiaries					Surface					Financial allocation (AIR 2018)
		2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	
M15	M15				16	315				16,017.09	335,497.37	70,147,754.00