MAINSTREAMING CLIMATE CHANGE IN RURAL DEVELOPMENT POLICY POST 2013

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Outline

- Introduction to project
- Technical Fiches
  - Selection of actions for fiche development
  - Translating actions into RDP operations
  - Fiche structure and example

Project Partners

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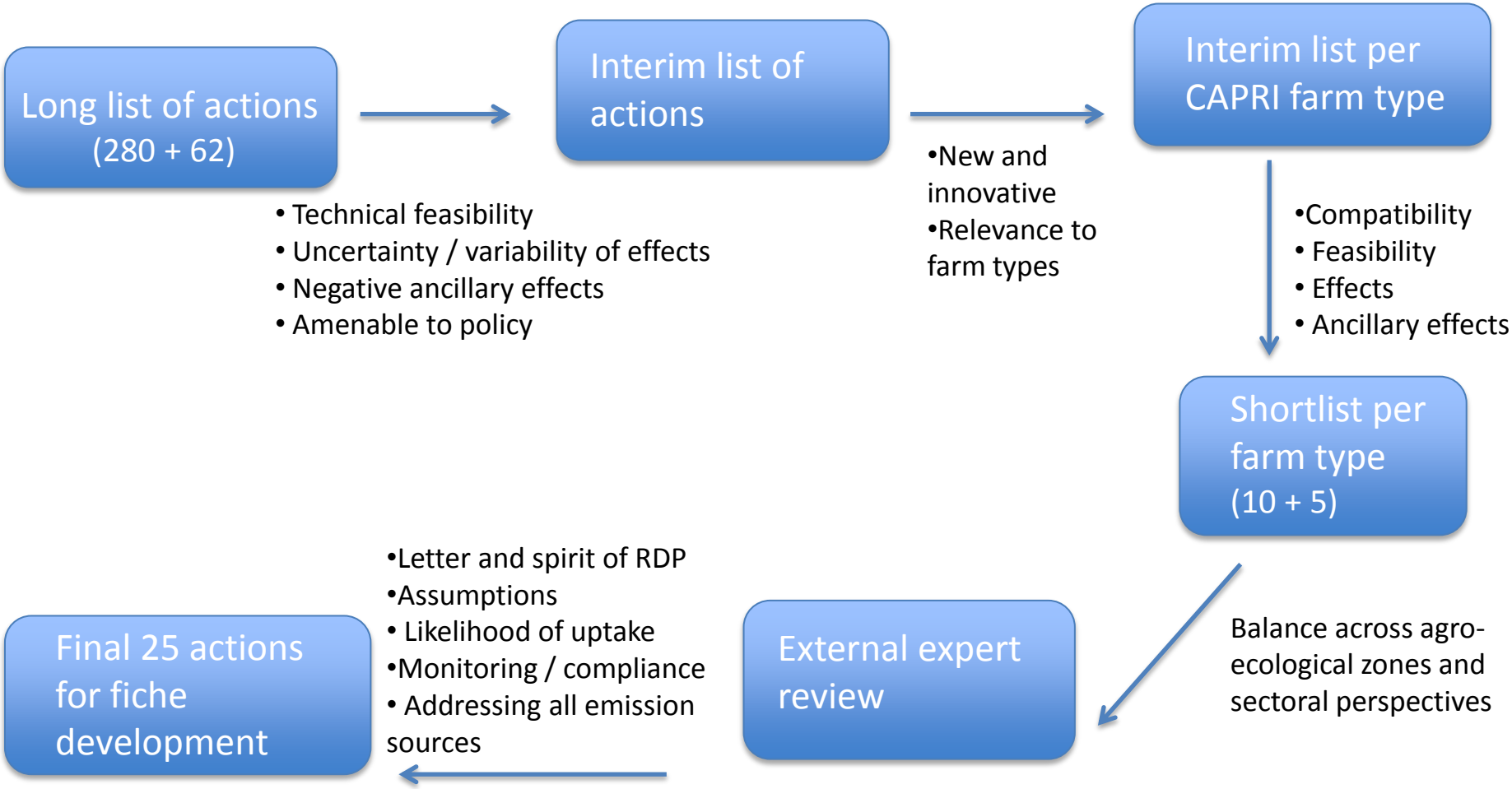
Project Outputs

- Inventory of new & innovative climate actions
- Technical fiches
- Guidance and best practice examples for LEADER
- Joint actions and thematic sub-programmes
- Combinations of RD measures and green growth indicators

Selection of actions for fiche development



Mitigation Actions	Adaptation Actions
Extend the perennial phase of crop rotations	Use of adapted crops
Use of cover crops / reduced bare fallow	Use of cover crops / reduced bare fallow
Improved N efficiency	Optimising greenhouse cultivation
Precise N application	Establishment/management of shelterbelts and hedges to provide multiple benefits
Biological N fixation in rotations and in grass mixes	
No-till	Reduced tillage/minimum tillage
Retain crop residues	On-farm harvesting and storage of rainwater
Loosen compacted soils / prevent soil compaction	Improved irrigation efficiency
Avoid drainage of wetlands / conversion of peatlands	Optimising drainage for multiple adaptation benefits
High fat diet (dietary lipids)	
Precision and multi-phase feeding	Soil erosion control plan
Better livestock health planning	
Climate proofing planned investments	
Behavioural change towards better energy efficiency	
Solar fodder dryers	
Carbon audit	

Translating actions into RDP operations

Action	Example operations
Cover crops / reduced bare fallow	Provision of area-based payments for the sowing of cover crops in arable rotations during the fallow period (and potentially, if verifiable, reduction of N application to following crop).
Improved N efficiency	Payment-by-result approaches using N use efficiency; training on how to increase N efficiency; support for nitrogen application plan.
Establishment/management of shelterbelts and hedges to provide multiple benefits	Capital support for planting hedgerows between fields or as buffer strips; compensation for establishment; preparation of landscape plan.
Improved irrigation efficiency	Farm advice on how to cope with water scarcity and efficient water use; support for investment in precision irrigation equipment; support for the preparation of water use plan.

Fiche Structure 1/3

Section	Content
Summary	Summary of benefits of proposed operation, monitoring and implementation; any risks involved
Baseline requirements	Relationship between proposed operation and other regulatory requirements that have to be met, e.g., Nitrates Directive, GAECs
General description of the action and operation	Mechanism, scope, mode of emissions and GHG reduction, adaptation benefits
Proposed general operation	Description of the operation Commitments: eligible activities, timing and duration, location, incompatible operations, safeguards against maladaptation Proposed combinations with other operations (e.g., training, advice)

Fiche Structure 2/3

Section	Content
Expected impacts on climate change on-farm	Quantification of abatement rate and/or qualitative assessment of adaptation benefits Key assumptions Applicability (by farm type, system and agri-environmental zone)
Ancillary effects	Description of synergies/trade-offs between adaptation/mitigation Description of other likely ancillary effects (positive and negative)
Guidance on costs and payment calculations	The private cost and savings - explanation of the main cost and savings elements Classification of the CE - (1) negative cost, (2) no/low cost, (3) significant cost Explanation of the main drivers of variation in costs

Fiche Structure 3/3

Section	Content
How to control the commitments	Potential result indicators Extent to which the mitigation effect would be captured by National GHG Inventories
Identified implementation challenges and barriers	Barriers to uptake Barriers to MRV Description of key uncertainties and indication of how uncertainties could be reduced and/or characterised
References	All fiches are referenced in detail using available/up-to-date scientific knowledge base, supplemented by expert opinions

Excerpt: Use of cover crops / reduced bare fallow

Commitments, funding conditions and eligibility

Guiding principles for developing specific operations are set out below.

Eligible activities

- Planting of cover crops in arable rotations during the fallow period (and reduction of N application to following crop).
- MA should provide a list of eligible rotations and cover crops, based on local agronomic expertise. In general suitable cover crops will be fast growing with good N uptake characteristics, such as mustard (Sinepsis alba) Schulte et al. (2012, p19).
- MA should specify a minimum seed sowing rate to provide a sufficiently dense canopy.
- No fertiliser (synthetic or organic) should be applied to the cover crop.

Timing and duration

PA should define the appropriate period of planting and the minimum and maximum length of the cover crop period. Autumn sown cover crops should be established early to enable uptake of N before the onset of winter. For some cover crops it may be beneficial to set a date by which the cover crop should be destroyed, in order to negate the impacts on spring production.

The presumption is that cover crops will have to be used during each year of the RDP, although exemption criteria may be provided to enable suspension of the operation on farms under specified conditions (e.g. rainfall beyond certain thresholds).

Excerpt: Use of cover crops / reduced bare fallow

Table 1. Abatement rates for cover crops sown during the fallow period of arable rotations

Mitigation effect	Abatement rate	Source
Increased soil C	0.874+/- 0.393 tCO_2e/ha/yr	Pellerin et al (2013) (based on Justes et al 2012)
	1tCO_2e/ha/yr	Schulte et al. (2012)
	"small, but significant increase in SOC"	Kirk et al. (2012)
	1.75tCO_2e/ha/yr	Posthumus et al (2013)
Reduce direct and indirect N>N_2O EFs	Highly variable	Pellerin et al (2013)
	0.49tCO_2e/ha/yr	Schulte et al. (2012)
	Leached N reduced by 30kgN/ha = 0.11tCO_2e/ha	Cameron et al (2002) (cited in O'Hara 2003)
Reduce amount of applied N	0.06tCO_2e/ha/yr	Pellerin et al (2013)
Fieldwork CO_2 – increased diesel use	-0.062tCO_2e/ha/yr	Pellerin et al (2013)

Excerpt: Use of cover crops / reduced bare fallow

Table 2. Ancillary effects of the operation

Positive effects		**Source**
Off-farm GHG	Reduction in emissions arising from fertiliser manufacture if synthetic fertiliser application is reduced	Pellerin et al (2013, p45)
Production	No significant effect	
Adaptation	Cover crops can provide significant adaptation benefits, by decreasing soil erosion and increasing soil water retention capacity	
Environment	Improved water quality via reduced runoff	Schulte et al (2012, p39) Kirk et al (2012, p36) Wiltshire et al. (2014, p23)
Negative effects		
Off-farm GHG	No significant effects	
Production	Potential loss of production if they lead to switching from winter to spring cultivation.	Wiltshire et al. (2014, p24)
Adaptation	No significant effects, if the operation is applied in areas with suitable soils and adequate rainfall.	
Environment	Increased herbicide use	Schulte et al (2012) Wiltshire et al. (2014, p23)

Excerpt: Use of cover crops / reduced bare fallow

Guidance on costs and payment calculations

No significant one-off costs arising from the operation are predicted.

Recurring costs arise from seed purchase and additional fieldwork for cultivation and destruction/incorporation of the cover crop. Savings may be made from reduced synthetic fertiliser application rates (see Table 3).

Table 3. Recurring costs of the operation (+saving -cost)

Recurring costs/savings	Total cost	Study
+Reduced fertiliser purchase -CC planting and destruction	€41/ha/yr €160/tCO_2e	Pellerin et al (2013)
-purchase of seed and fuel costs associated with cultivation of the crop	€71.20/ha/yr ~€50/tCO_2e	Schulte et al (2012)
-seed (£55/ha/yr) -cultivation/drilling (£60/ha/yr) -incorporating crop residues (£25/ha/yr)	£140/ha/yr	Posthumus et al (2013)

The cost-effectiveness is categorised as being in category 3, significant cost.

The main driver of variation in cost-effectiveness is likely to be the cost of the cover crop cultivation and incorporation, which will depend on the efficiency of cultivation. This operation is unlikely to be cost-effective in areas where cultivation costs are high, or where there is a risk of yield penalties through use of the cover crop.

Excerpt: Use of cover crops / reduced bare fallow

How to control the commitments

Compliance could be verified in a number of ways:

1. Integrated into current monitoring programmes (if they coincide with the cover crop cultivation timing).
2. Via provision of proof of purchase of cover crop seeds
3. Via remote sensing or aerial photography (Pellerin et al 2013, p47)

Potential result indicators

- P4C % of agricultural land under management contracts improving soil management and/or preventing soil erosion (ha)
- P5E % of agricultural and forest land under management contracts to foster carbon sequestration/conservation

Extent to which the mitigation effect would be captured by National GHG Inventories

Changes in soil carbon stocks would require specific soil C emissions factors and would not be captured in most current approaches.

N_2O reduction from reduced rates of conversion of applied N to N_2O, could be captured with a tier 2 approach if EFs for N losses under cover crops could be derived and verified.

N_2O from reduced N application could be captured under T1 if cover crops lead to a reduction in total N application, and reduction in N due to cover crop could be established..

Off-farm changes in emissions would not be captured.

Excerpt: Use of cover crops / reduced bare fallow

Table 4. Potential barriers to uptake and key risks/uncertainties

Barrier to uptake	**Source**
Establishment of cover crop coincides with busy period in the farming calendar	Kirk et al (2012, p34)
Reduces time to establish the following crop	Wiltshire et al. (2014, p21)
Cost of seed and cultivation	Kirk et al (2012, p34), Wiltshire et al. (2014, p21)
Risk of damage to soil from establishing or destroying the cover crop in wet conditions	Kirk et al (2012, p34)
Risk of negative affect on yield of following crop	Wiltshire et al. (2014, p21)
Concerns about herbicide use and resistance	Wiltshire et al. (2014, p21)
Lack of suitable land	Wiltshire et al. (2014, p21)
Other key risks/uncertainties	
Effect on N_2O emissions uncertain	Pellerin et al (2013, p44) Kirk et al (2012, p33)

Next Steps

- Draft guidance available by mid-June
  - Technical fiches and inventory
  - LEADER and joint action concepts
  - Measure combinations
- Project workshop - 17 June 2014, Brussels
- Written feedback welcome
- Project concludes in September

THANK YOU FOR YOUR ATTENTION.

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