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ENVIEVAL

Development and application of new methodological frameworks for the evaluation of environmental impacts of EU rural development programmes

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Abstract

Evaluations of environmental impacts of RDPs are characterized by a number of methodological challenges. However, recent methodological developments have improved the understanding and capacity of analysing the impacts of farming and forestry on the provision of public goods. Against this background, the main aim of ENVIEVAL is to develop and test improved tools for the evaluation of environmental impacts of rural development measures and programmes in EU Member States. The main innovative aspects of the new methodological frameworks are that they enable the integration of micro- and macro-level evaluations (and their results) and provide guidance on the selection and application of cost-effective evaluation methods to estimate net effects of rural development programmes on the different main public goods from farming and forestry.

Key words

Rural development programmes, evaluation methods, environmental indicators, counterfactuals

Introduction

Council Regulation (EC) 1305/2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) obliges all EU Member States to establish a system of ex-ante evaluations, annual implementation reports and ex post evaluations for each rural development programme (RDP) (Art. 75 to Art. 79) (EU-Commission, 2013). Evaluations of environmental impacts of RDPs are characterized by a number of methodological challenges: (i) the linkages between the different levels of indicators (e.g. from result indicators at measure to impact indicators at programme level); (ii) the linkages between indicators and different rural development measures (iii) the complexity and data requirements of existing and additional impact indicators; (iv) counterfactual development for measures implemented across large areas; (v) the quantification of net impacts of the RDPs at the macro-level and establishing causal-effects relationships and (vi) environmental impacts of rural development measures are strongly influenced by site-specific circumstances, which may take a long time to emerge and often depend on a range of other intervening factors.

Recent methodological developments have improved the understanding and capacity of analysing the impacts of farming and forestry on the provision of public goods (e.g. Reinhard et al., 2013, Chabé-Ferret and Subervie, 2013, Michalek et al., 2012). In addition, advances in the development of indicators, data availability and geographic analysis provide new opportunities to address existing key challenges of evaluating environmental impacts of RDPs (e.g. Targetti et al., 2014, Teillard et al., 2012, Concepción et al., 2012).

Against this background, the main aim of ENVIEVAL is to develop and test improved tools for the evaluation of environmental impacts of rural development measures and programmes in EU Member States. In order to achieve this main aim, the project has five objectives:

- To review implemented rural development programmes, existing monitoring and indicator systems, and new methodological developments in environmental policy evaluation
- To develop new methodological frameworks for the evaluation of net environmental effects of rural development programmes against their counterfactual
- To test and validate the selected evaluation methods through public good case study applications in the partner countries and close collaboration with national and regional evaluators and managing authorities
- To assess the cost-effectiveness of the tested indicators and evaluation methods

- To provide a methodological handbook for the evaluation of environmental impacts of rural development programmes.

The main innovative aspects of the new methodological frameworks are that they enable the integration of micro- and macro-level evaluations (and their results) and provide guidance on the selection and application of cost-effective evaluation methods to estimate net effects of rural development programmes on the different main public goods from farming and forestry.

The paper briefly synthesizes the overall approach of the ENVIEVAL project and summarise some key results from the consultations on stakeholder expectations and requirements for evaluation tools and indicators.

The ENVIEVAL approach

The state and extent of the provision of different public goods from agriculture such as biodiversity, water quality, landscapes and animal welfare, as well as the priorities in the rural development programmes, vary greatly across the different rural environments in the partner countries including Finland, Germany, Greece, Hungary, Italy, Lithuania and UK. Agricultural systems vary from intensive farming with fertile soils and favourable climatic conditions, to extensive livestock systems in some of the most marginal and remote areas in the EU which also suffer from unfavourable natural conditions and isolation from markets. Agricultural sectors in the Baltic States and Hungary are going through a process of significant structural change affecting the quality and quantity of public goods they provide. The differences in the provision of public goods, rural development programmes and agricultural structures provide a diverse setting for the testing of improved tools to evaluate the environmental impacts of rural development programmes in a set of case studies which will also take account of different data requirements and availability.

Figure 1 outlines the integration of different tasks required to develop and test the methodological framework. In a first step suitable indicators and recent methodological developments for counterfactual evaluation of environmental impacts at micro and macro level were identified and their potential to address future evaluation challenges and needs were discussed with evaluators and other relevant stakeholders. Then data requirements of the selected indicators and methods were assessed and case study areas with good data availability selected. The selection of the case study areas built on the availability of the data required to test the different indicators and methods and on their relevance to farming and forestry, with respect to the environmental objectives of CAP and the structure of the CMEF. Table 1 provides an overview of the selected case study areas, the covered public goods, key policy measures and main available data sources and types.

An important conceptual step was then the development of logic models for the methodological framework for the evaluation of net environmental effects of rural development programmes against their counterfactual. The logic model provide a conceptual framework for the evaluation process, linking the different and complex decisions to be done by evaluators from the selection of the policy measures and evaluation questions to the selection of the most suitable method combinations. In other words, the logic models provide a decision tree for evaluators and managing authorities to develop a consistent methodological framework combing the selection of indicators, counterfactual approaches and micro and macro level evaluation methods in accordance to the specific circumstances the evaluator or managing authority is facing (for example with respect to data availability). The practical relevance of the logic models, as well as the case study design, will now be reviewed and validated in another stakeholder consultation.

Table 1 Overview of covered public goods and case study areas

Public good	Country	Case study areas	Shortlist of key policy measures	Available types of data
Animal welfare	Germany	North-Rhine Westphalia	121, 215	IACS, Census, FADN, Identification and Information System for Animals, primary data on animal welfare indicators
Biodiversity HNV	Lithuania	Lithuania (whole country)	212, 213, 214, 221, 223, 224, 225, 226,	IACS, HNV assessment GIS data, National landscape management plan, farm data on land use, LPIS-GIS data, CORINE, Farmland bird index data, National EU protected habitat inventory, Abandoned land register
	Italy	Veneto region	214	IACS, LPIS, Agricultural Census, FSS 2007 and 2013, FADN, Land cover maps, Bird census data
Biodiversity Wildlife	Hungary	Heves-plain	212, 213, 214, 216, 221, 224, 225	IACS, FADN, LPIS data, Monitoring data of common bird species, Monitoring data for biodiversity, Spatial map of crop rotation, Soil quality data (TERRADEGRA), Agri-environment monitoring data
	Lithuania	Šilutė region/Dovinė river basin	212, 213, 214, 221, 223, 224, 225, 226	IACS, HNV assessment GIS data, National landscape management plan, Farm data on land use, LPIS-GIS data, CORINE, Vegetation maps, Aquatic warbler, and great snipe monitoring data, Hydrological monitoring data, Contact information to farmers, Annual biodiversity monitoring program, Farmland bird index data, National EU protected habitat inventory, Abandoned land register, Cattle register
Climate stability	Finland	Finland (whole country)	121, 123, 124, 211, 212, 214, 216	FADN, IACS, Data needed in Dremfia sector model, Data on ex-post period 1995-2012, Farm statistics data, CAP payment data, Use of inputs in agricultural production, Activity based cost models, activity based unit cost calculations, Use of different feed stuffs per animal
	Italy	Veneto Region	214, 221, 222	IACS, LPIS, Agricultural Census, FSS 2007 and 2013, FADN, Land cover maps, National Greenhouse Gas Inventory
Landscape	Greece	Island of Santorini	125, 211, 212, 214, 216, 227, 321, 323	Number of beneficiaries, area under agreement and amount of support, IACS, Spatial data on land parcels, crop cover, Land use maps, Aerial photos
	Scotland	Grampian Region	212, 214, 221	IACS, Agricultural Census, Farm Structure Survey, FADN, Landscape Character, Land Cover Map, Ordnance Survey digital height models
Soil functionality	Hungary	Heves-plain	212, 213, 214, 216, 221, 224, 225	IACS, FADN, LPIS data, Retrospective spatial map for crop rotation, Soil quality data (TERRADEGRA), Agri-environment monitoring data
	Scotland	Grampian Region	212, 214, 221	IACS, Agricultural Census, Farm Structure Survey, FADN, National Soil Inventory, Digital soil maps and soils characteristics
Water quality	Finland	Southern Finland	211, 212, 214,	FADN including data on production inputs (nitrogen fertilizer and pesticide/herbicide expenses), IACS
	Germany	Lower Saxony	114, 121, 214, 323	IACS, Census, FADN, primary and secondary data on N and P indicators (farm and regional level)
	Greece	Thessaly	111, 114, 121, 125, 214, 216, 221, 226	Number of beneficiaries, area under agreement and amount of support, IACS, Spatial data on land parcels, crop cover, soil maps of the area, special action plans for NVZs, hydrographic maps, regional plan for water management in compliance to WFD

The cost-effective application of the selected methods will be tested in public good case studies from September 2014 to July 2015. The public good case study approach allows the development, testing and integration of evaluation methods according to their suitability for specific environmental objectives, and reflects the central aim of the Common Agricultural Policy (CAP) to deliver public goods from farming and forestry. An important aspect of the case studies is the simulation of different data availabilities across EU Member States and regions to test the robustness and reliability of the methods. The cost of developing and applying the different indicators, monitoring requirements and evaluation methods and their impacts on the quality of the evaluation results will be compared and tested in the public good case studies, considering the robustness of the results, the level of details and the ability to draw generic conclusions.

The results of the case study testing will inform the development of a user-friendly methodological handbook to provide guidance to evaluators and policy-makers for the main annual implementation reports in 2017 and 2019 and the ex-post evaluation of the EU rural development programmes 2014 - 2020.

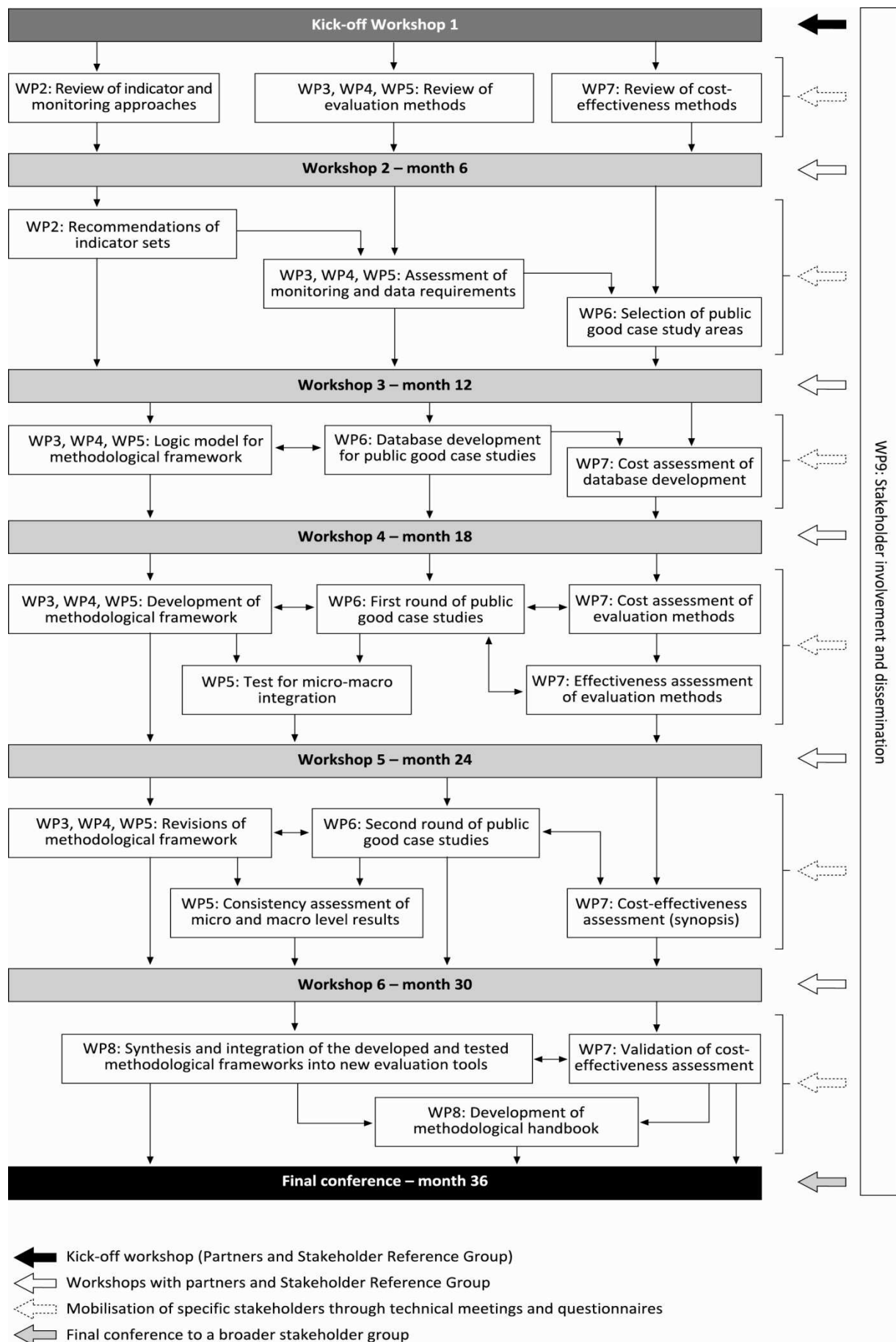


Figure 1 Overview of the ENVIEVAL approach

Integrating stakeholder needs into the case study testing

A total of 31 qualitative interviews were conducted with evaluators, monitoring organisations, and managing authorities in Finland, Germany, Greece, Hungary, Italy, Lithuania, Poland, the United Kingdom and the European Evaluation Network for Rural Development (EENRD), using a guideline-based questionnaire with mainly open questions. The questionnaire was divided into two main sections including current evaluation approaches and gaps and the stakeholder expectations and requirements for future indicators and methods.

The results of the stakeholder consultation and the method reviews highlight the lack of data on non-participants as a key constraint for the application of more advanced evaluation methods. The findings also highlight the need for innovative approaches to design comparison groups in counterfactuals and a better understanding of the linkages between different scales and levels to overcome the challenge to evaluate impacts across different scales and levels. The stakeholders raised the issue that a better understanding of the linkages between different scales and levels is required to overcome the challenge to evaluate impacts across different scales and levels. The need for new indicators in environmental RDP evaluations was highlighted in particular to improve the ability to establish consistent linkages between the impacts of different measures and the overall programme impact. In addition, evaluation methods such as quantitative models should be fit for purpose and better integrate and link the different scales and levels of assessment. That also implies that the scales of the data captured and used have to be compatible with those required for the levels of reporting.

Taking into account these findings, a range of different methods has been selected for case study testing for counterfactuals (e.g. propensity score matching, inclusions of multiple comparison groups considering different support intensities and changes in participation status over time), micro level (e.g. biophysical models, footprint method, and landscape metrics) and macro level (e.g. spatial econometrics, scaling methods, footprint method and landscape metrics) assessments. The following key questions could be derived for the case study testing:

- How suitable and robust are the selected methods in the context of different data availabilities and stakeholder aspirations and abilities?
- How do the selected methods establish clear and robust causal linkages between the measure and / or programme and environmental impacts?
- To what extent contribute the methods to a consistent assessment of environmental impacts at micro and macro levels?

Summary

The case study result will provide valuable information for evaluators and policy-makers on the suitability and selection of different evaluation methods in future evaluations taking into account differences in data availability between Member States, environmental aspects, skills of the evaluators and existing financial resources. A user-friendly methodological handbook will synthesise fact sheets on the development and application of the different evaluation tools and provide guidance to evaluators and policy-makers for future evaluations of EU rural development programmes.

Detailed results of the review of environmental indicators and evaluation methods, the assessment of the data requirements of the candidate methods for the case study testing and descriptions of the selected case study areas can be found on the ENVIEVAL website (www.envieval.eu). Further publications explaining the logic models for the methodological framework will be added soon.

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References

- Chabé-Ferret S, Subervie J (2013). How much green for the buck? Estimating additional windfall effects of French agro-environmental schemes by DID-matching. *Journal of Environmental Economics and Management* 65: 12-27.
- Concepción E.D., Díaz M., Kleijn D., Báldi A., Batáry P., Clough Y., Gabriel D., Herzog F., Holzschuh A., Knop E., Marshall E.J.P., Tschardt T., Verhulst J. (2012). Interactive effects of landscape context constrain the effectiveness of local agri-environmental management. *Journal of Applied Ecology* 49: 695–705.
- EU-Commission (2013). REGULATION (EU) No 1305/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:347:0487:0548:EN:PDF> [last accessed 10/07/2014]
- Michalek J. (2012) Counterfactual impact evaluation of EU rural development programmes – Propensity Score Matching methodology applied to selected EU Member States. Volume 2: A regional approach. EC, Joint Research Centre – Institute for Prospective Technological Studies, EUR number 25419 EN.
- Reinhard S., Linderhof V., van Leeuwen E., Smit M.J., Nowicki P., Michels R. (2013). Spatial econometric models for evaluating RDP measures: analyses for the EU27 SPARD (Vol. SPARD deliverable D4.3). Den Haag (the Netherlands): LEI-Wageningen UR.
- Targetti S., Herzog F., Geijzenborffer I.R., Wolfrum S., Arndorfer M., Balázs K., Choisis J.P., Dennis P., Eiter S., Fjellstad W., Friedel J.K., Jeanneret, P., Jongman R.H.G., Kainz, M., Luescher G., Moreno G., Zanetti T., Sarthou J.P., Stoyanova S., Wiley D., Paoletti M.G., D. Viaggi (2014). Estimating the cost of different strategies for measuring farmland biodiversity: Evidence from a Europe-wide field evaluation, *Ecological Indicators* 45: October 2014, Pages 434-443
- Teillard F., Allaire G., Cahuzac E., Léger F., Maigné E., Tichit M. (2012). A novel method for mapping agricultural intensity reveals its spatial aggregation: Implications for conservation policies. *Agriculture, Ecosystems & Environment* 149: 135–143.