



INTERACTIVE DECISION TOOL

DATA FOR THE ASSESSMENT OF RDP ACHIEVEMENTS AND IMPACTS

IMPACT INDICATORS:

I.10 WATER ABSTRACTION IN AGRICULTURE

I.11 WATER QUALITY:

I.11-1 GROSS NUTRIENT BALANCE (GNB) (*GROSS NITROGEN BALANCE (GNB-N) AND GROSS PHOSPHORUS BALANCE (GNB-P)*)

I.11-2 NITRATES IN FRESHWATER

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JANUARY 2019



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ACKNOWLEDGEMENTS

DISCLAIMER

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Recommended citation:

EUROPEAN COMMISSION – Directorate-General for Agriculture and Rural Development – Unit C.4 (2019): Interactive decision tool - “Data for the assessment of RDP achievements and impacts” with a focus on data and information sources pertinent for the assessment of RDP achievements and impacts in 2019 and ex-post . Brussels, January 2019.

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The Evaluation Helpdesk is responsible for the evaluation function within the European Network for Rural Development (ENRD) by providing guidance on the evaluation of RDPs and policies falling under the remit and guidance of DG AGRI’s Unit C.4 'Monitoring and evaluation' of the European Commission (EC). In order to improve the evaluation of EU rural development policy the Evaluation Helpdesk supports all evaluation stakeholders, in particular DG AGRI, national authorities, RDP managing authorities and evaluators, through the development and dissemination of appropriate methodologies and tools; the collection and exchange of good practices; capacity building, and communicating with network members on evaluation related topics.

Additional information about the activities of European Evaluation Helpdesk for Rural Development is available on the Internet through the Europa server (<http://enrd.ec.europa.eu>).





ACKNOWLEDGEMENTS

*The interactive **decision tool**, ‘**Data for the assessment of RDP achievements and impacts**’, has been developed by an international team of rural development evaluation experts including Jerzy Michalek, Demetrios Psaltopoulos, Dimitris Skuras, Jela Tvrdonova, Darko Znaor. The related thematic working group has been coordinated by the Evaluation Helpdesk under the guidance of Valdis Kudiņš and Hannes Wimmer. Giulia Bekk, Valérie Dumont, Matteo Metta and Myles Stiffler supported the development work and ensured the quality and visual appearance of the final interactive tool. Various experts have provided valuable input as peer reviewers (Juris Hāzners, Jaroslav Pražan, Gerald Schwarz). Representatives of DG Agriculture and Rural Development have ensured the coherence of the tool with the EU’s policy framework.*

The interactive **decision tool**, ‘**Data for the assessment of RDP achievements and impacts**’, is based on the logic model approach which was originally developed by the EU collaborative project ENVIEVAL (Grant Agreement No. 31207 in the EU’s 7th Framework Programme for research, technological development and demonstration). The Evaluation Helpdesk has applied this approach for its thematic working group, which serves to support Member States in their assessment of RDP impacts in 2019 and the ex-post.





INTRODUCTION

The choice of a suitable evaluation approach is a critical step in the evaluation process. The wish to carry out a robust assessment of the policy's effects needs to be matched with those aspects which factor into conducting an evaluation (data and information availability, budget and resources, and the skills of the evaluators).

In the non-binding Guidelines, 'Assessment of RDP impacts and achievements in 2019', published in August 2018, logic models have been presented for the 13 Common CAP impact indicators covering Pillar II. These logic models support Member States in discussing different criteria for the choice of evaluation approaches for assessing the RDP's impacts during the evaluation activities in 2019 and the ex-post (2024).

The decision tool, 'Data for the assessment of RDP achievements and impacts', transports the logic models developed in the above Guidelines into an interactive format, while providing further detailed and practical information. The decision tool has been specifically **designed for RDP** evaluators who may wish to gain further insights into the criteria for each step of the decision making process when choosing an evaluation approach. This tool also provides practical recommendations on what to do in case of data gaps both in the short and long term, when solutions are needed.





OBJECTIVES

The **interactive decision tool** consists of a set of 7 logic models covering the 13 Pillar 2 CAP Impact Indicators. The 7 logic models can be read separately and aim to:

- **Assist evaluation stakeholders** in their decision on which evaluation approaches they can use for the assessment of the common RDP impact indicators, as well as providing the necessary data and information sources at the EU level for these approaches.
- **Provide recommendations on possible solutions for overcoming data-gaps at the national and regional levels** (e.g. by providing guiding questions, practical hints and links to external information sources).

The tool focuses on data and information sources pertinent for the assessment of RDP achievements and impacts in 2019 and the ex-post. The decision tool is based on the Guidelines '*Assessment of RDP impacts and achievements in 2019*'. Additionally, the tool provides:

- Explanations on data needs for proposed evaluation approaches including availability and suitability of data for RDP evaluations (frequency, delays, time series).
- Important questions to consider.
- Links to existing data sources and good practices.
- Complementary information on evaluation methods and their data needs.





HOW TO USE THE TOOL

This interactive decision tool contains a set of **7 logic models**:

Sector-related impacts



I.01 Agricultural entrepreneurial income



I.02 Agricultural factor income



I.03 Total factor productivity in agriculture

Socio-economic impacts



I.14 Rural employment rate



I.15 Degree of rural poverty



I.16 Rural GDP per capita

Environmental impacts



I.07 Emissions from agriculture

I.07 – 1 GHG emission from agriculture

I.07 – 2 Ammonia emissions from agriculture



I.08 Farmland Bird Index (FBI)



I.09 High Nature Value (HNV) farming

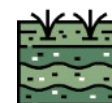


I.10 Water Abstraction in Agriculture



I.11 Water Quality:

I.11-1 Gross Nutrient Balance (GNB) (*Gross Nitrogen Balance (GNB-N) and Gross Phosphorus Balance (GNB-P)*)
I.11-2 Nitrates in freshwater



I.12 Soil organic matter in arable land



I.13 Soil erosion by water

I.13-1 Estimated rate of soil loss by water erosion;
I.13-2 Estimated agricultural area affected by a certain rate of soil erosion by water





HOW TO USE THE TOOL

Navigation within the clickable logic model:



Brings the user back to the starting page of the **logic model**

Are variables explaining participation known?

Takes the user to that specific **decision question** of the logic model



Starting decision question of the logic model

Hyperlinked text

Takes the user to an external source or to another slide



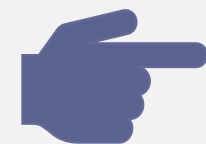
Examples



Additional notes



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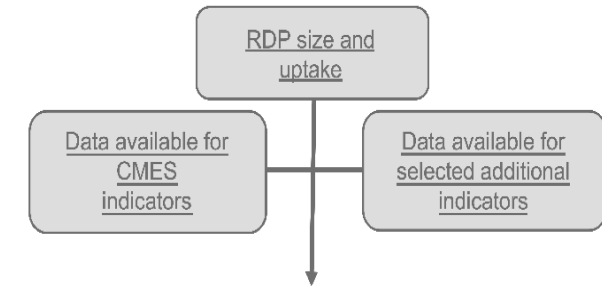


HOW TO USE THE TOOL

Structure:

Each logic model begins with a description of the:

- **RDP size, uptake** and other aspects that have to be considered for the selection of the evaluation approach.
- **Data availability for CMES indicators** needed to assess net impacts at the micro and macro levels, as well as, the specificities in the data availability for regionalised RDPs.
- **Data availability for selected additional indicators.**



Each **decision question** is organised in a way that facilitates the answers to the following **sub-questions**:

- Why is this question important?
- What are the conditions in order to answer the question with YES?
- Are there any specificities to be considered for regionalised RDPs?
- What can be done to improve the data situation (In the short term (for AIR 2019) and long-term (for ex-post)?

Each sub-question can be explored by clicking on its link.

Does the data allow for the construction of comparison groups of beneficiaries and non-beneficiaries?

[Why is this question important?](#)

[What are the conditions in order to answer the question with YES?](#)

[Are there any specificities to be considered for regionalised RDPs?](#)

[What can be done to improve the data situation?](#)

[Short-term solutions \(for AIR 2019\)](#)

[Long-term solutions \(for ex-post\)](#)

By answering each decision question in the tool with either a **'YES'** or a **'NO'** one will be taken to the next question, which will ultimately lead one to all possible evaluation approaches that can be applied given the specific criteria they have selected.





HOW TO USE THE TOOL

The tool will suggest various applicable approaches based on the data and other information:

- **Approach A (an evaluation approach in an optimal data situation).**
It can be used in 2019 and/or can be planned for the ex post evaluation.
- **Approach B (an alternative evaluation approach in case of data gaps).**
In several cases, approach B contains a qualitative component.

Approach A (optimal)



Approach B (alternative)



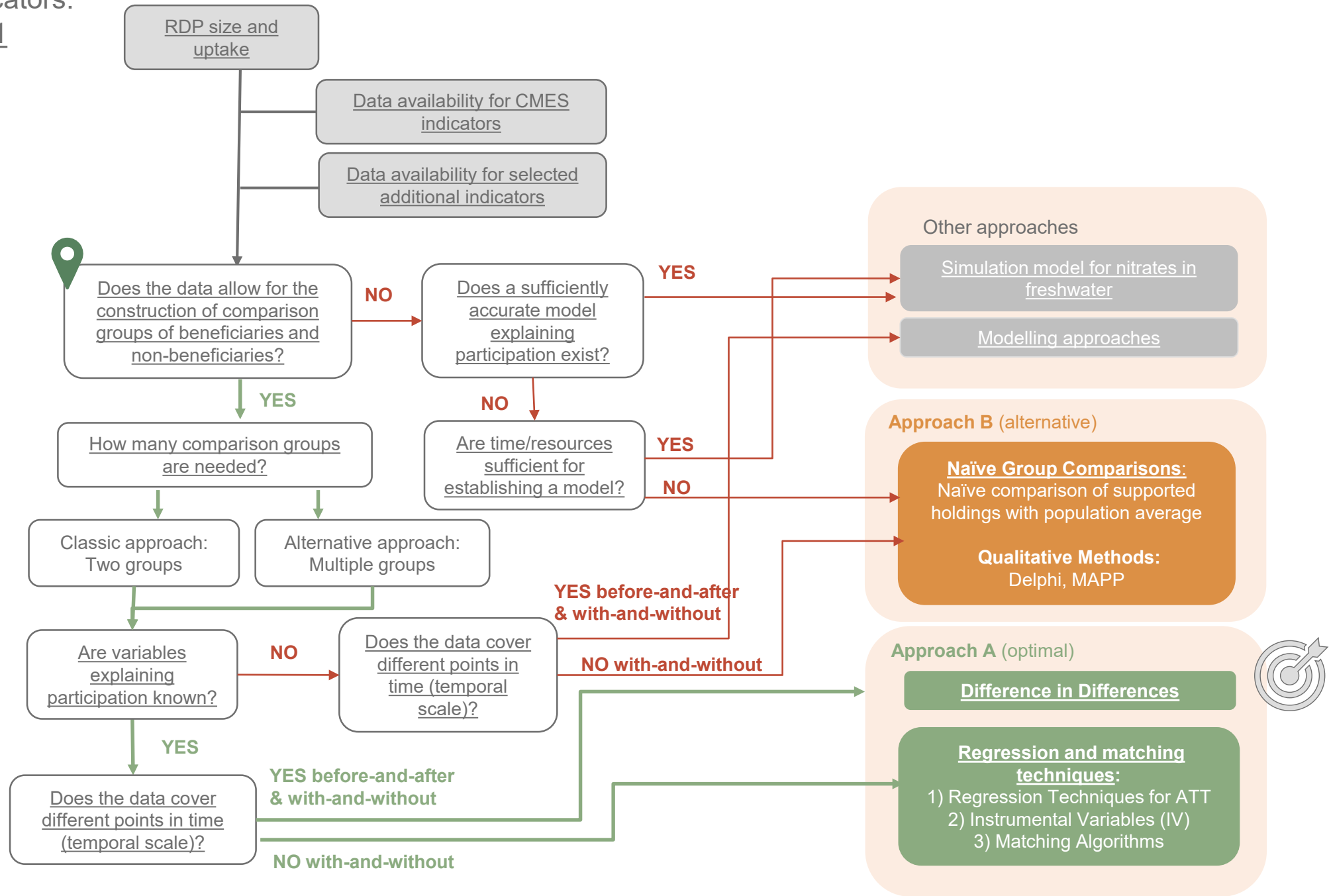
In case of questions or any technical difficulties in accessing the files, please contact the European Evaluation Helpdesk for Rural Development:

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Impact indicators:
I.10 and I.11





Impact indicators

I.10 Water Abstraction in Agriculture

I.11 Water Quality:

- I.11-1 Gross Nutrient Balance (GNB) (Gross Nitrogen Balance (GNB-N) and Gross Phosphorus Balance (GNB-P))
- I.11-2 Nitrates in freshwater

Impact indicators fiches



Guidelines Assessing RDP achievements and impacts in 2019, PART II, Chapters 2.6.1 and 2.10.1, Section: 'Intervention logic'

Related Common Evaluation Questions:

CEQ 26: 'To what extent has the RDP contributed to improving the environment and to achieving the EU biodiversity strategy target of halting the loss of biodiversity and the degradation of ecosystem services, and to restore them?'



Guidelines Assessing RDP achievements and impacts in 2019, PART III, Chapters 3.5, Section: 'Clarification of general intervention logic linked to the CEQ'

CEQ 28: 'To what extent has the RDP contributed to the CAP objective of ensuring sustainable management of natural resources and climate action?'



Guidelines Assessing RDP achievements and impacts in 2019, PART III, Chapters 3.7, Section: 'Clarification of general intervention logic linked to the CEQ'





RDP size and uptake

The size, uptake and the structure of the RDP are important factors in the selection of the evaluation approach. If only a few units are supported by measures under the given rural development priorities and focus areas that affect both water related impact indicators, then no significant RDP effects can be expected. If this is the case, the evaluator can only apply a less robust evaluation approach, such as naïve group comparisons or qualitative methods. In cases where the RDP is large and there is sufficient uptake (the level of sufficient uptake depends on the size and structure of the programme) the evaluator can apply more advanced evaluation approaches.

With respect to size and uptake of water related measures, the evaluator should consider the following aspects:

- Measures targeting water abstraction and water quality can be geographically focused in certain areas of the RDP that may be water stressed areas, Nitrate Vulnerable Zones (NVZs), or areas defined as 'degraded' or 'polluted' by the River Basin Management Plans or by Natura2000 Management Plans. The size and uptake of the RDP in these areas may be small in relation to the national or regional scale, but still it may be extremely important for these areas. If the uptake allows, advanced evaluation methods should be applied, despite the seemingly small size (total number of units or budget) of the intervention in relation to the whole RDP.
- The allocation of the RDP's budget for water related interventions to public infrastructure and private investments. Since there is no counterfactual for public infrastructure the consideration of size and uptake primarily applies to non-public projects.





Data availability for CMES indicators

What is the unit of analysis and data available (EU Level)?

- At the micro level, the unit of analysis is:
 - For water abstraction (I.10) and water quality (I.11 – GNB) the agricultural holding.
 - For water quality (I.11 - Nitrates in freshwater) the monitoring site.
- At the macro level, the unit of analysis can be any spatial unit such as NUTS 3 or the RBD (River Basin District).
- Specificities in the data availability for regionalised RDPs





Data available:

- **For assessing water abstraction and GNB** (both N and P) there is no recent micro-level data available at the EU level. A survey of agricultural holdings should be undertaken for this purpose to create a database.
- **For assessing Nitrates in freshwater** the European Environment Agency maintains the Water Information System for Europe (WISE) and Water-Quality (WISE 4) which reports aggregate and disaggregated data for different levels including that of the monitoring site.

 Note

 Note

Proxies:

- At the micro level there are no proxies for the common indicators I.10 and I.11 (GNB and Nitrates in Freshwater).

Surveys:

- The data and information needed for I.10 and I.11 (GNB) should be collected via surveys. Further information can be found in:
 - Eurostat and OECD (2014), 'Data Collection Manual for the OECD/Eurostat Joint Questionnaire on Inland Waters', Version 3.0. p. 52.
 - Eurostat and OECD (2013), 'Nutrient Budgets – Methodology and Handbook', Version 1.02. p. 27-28.
- This survey data may include:
 - type of water source (public water supply, self-supply from fresh surface water, self-supply from fresh groundwater, desalinated water, reused water);
 - actual irrigation (type of crop according to agricultural statistics, irrigated hectares, irrigation in m³/year);
 - distribution of water to farms by irrigation techniques including sprinkler, trickle, and gravity (irrigated hectares, water distributed in m³/year);
 - water used for other purposes (e.g. livestock, washing);
 - nutrient inputs (fertiliser, manure, etc.) and nutrients outputs (cultivations, sales of manure, etc.).





Data availability for CMES indicators

Micro level

Note(s)



When the term EU level is used it is in reference to databases which provide micro-unit level data (under certain conditions) for all, or the overwhelming majority of EU member states. These databases may be maintained by Eurostat (e.g. FADN, the Household Budget Survey, etc), by private organisations (e.g. the Amadeus database on firms) or by other EU organisations such as the European Environment Agency (e.g. on water or soil sampling points).





Data availability for CMES indicators

Micro level

Note(s)



The location of the monitoring sites is provided in a spatial shapefile (GIS format). The database in its September 2018 update includes all Member States with the exception of Slovenia. The most recent data refers to 2016, but not for all Member States. The database is updated on annual basis (at minimum) based on information provided by the Member States.

For the most up to date information, which may not have been publicised yet, evaluators can consult the WFD National Data Reporters or the WISE National Reporting Coordinators.


For any other changes you can always contact the European Environment Information and Observation Network (Eionet) helpdesk at wfd.helpdesk@eionet.europa.eu.






Data available:


At the Member State level per indicator the following data sources exist:

- **For Water Abstraction (I.10):** The OECD/Eurostat Joint Questionnaire on Inland Waters is aggregated at the level of national territories and provides an estimate of gross water abstraction for agricultural purposes. The indicator I.10 records water used for agriculture in total and for irrigation in particular.  Note

The European Environment Agency (EEA) maintains the WISE SoE Water-Quantity (WISE 4) database, which provides aggregated and disaggregated data at the level of River Basin District (RBD) and sub-district up to the national level.  Note

Water use recorded at the RBD level and at the country level, but based on WFD data is also provided by Eurostat.  Note

Water used for irrigation on the farm also was reported in the Survey on Agricultural Production Methods (SAPM) at the NUTS 2 level.

- **For Water Quality – GNB (I.11):** Gross Nutrient Balance both for Nitrogen (N) and Phosphorus (P) is provided at the national level by Eurostat.  Note
- **For Water Quality – Nitrates in freshwater (I.11):** The Eurostat indicator on ‘Nitrate Pollution’ has been archived and discontinued and relevant information can be obtained by the EEA. The only possibility to calculate a national or regional figure of the percentage of monitoring sites falling into the indicator’s quality categories is to use the WISE SoE Water-Quality (WISE 4) database as described above.

Proxies:

- There are no proxies for Water Abstraction (I.10), GNB (I.11) or Nitrates in freshwater (I.11) for the macro-level.

Surveys:

- Many Member States conduct their own surveys or have their own detailed national and regional databases.

Examples:

- Spain
- Italy
- Denmark
- France





Data availability for CMES indicators

Macro level

Note(s)



- No regional data is provided for this variable.
- Estimates are updated annually.
- Ireland, Italy, Austria and Portugal are not recorded.
- Other Member States record sparingly (e.g. Finland and Germany).
- The latest available year is 2015 for those Member States that report data.





Data availability for CMES indicators

Macro level

Note(s)



- The database's September 2018 update includes all Member States.
- The most recent data refers to 2015-2016, but not for all RBDs.
- The database is updated on an annual basis (minimum) based on the information provided by the Member States.





Data availability for CMES indicators

Macro level

Note(s)



- Latest available data refer to 2015.





Data availability for CMES indicators

Macro level

Note(s)



- The latest available year is 2016 for some Member States, however data from 2015 and before can be found for almost all Member States.
- The data is based on estimates for the following countries:
 - Belgium
 - Bulgaria
 - Denmark
 - Estonia
 - Greece
 - Croatia
 - Italy
 - Cyprus
 - Latvia
 - Lithuania
 - Luxembourg
 - Malta





Data availability for CMES indicators

Macro level

Example(s)



The Spanish 'Instituto Nacional de Estadística' (INE) maintains a 'survey of water usage in the agricultural sector' with a regional series for 2000-2016.



The Italian 'Istituto Nazionale di Statistica' (Istat) has compiled a very detailed study of irrigation water by region, type of cultivation and type of irrigation method based on the 2009-2010 SAPM and published it in 2014. These studies are useful as they provide 'coefficients' of water use by cultivation and irrigation method that can be applied to more recent data.



Denmark operates a very coherent and dense water monitoring programme where the 14 regional Danish counties are responsible for maintaining monitoring sites and for monitoring groundwater, rivers, lakes and coastal waters.



In France, the 'Réseau National de Bassin' system operates six basin agencies responsible for providing reliable data related to French inland surface waters. The network operates almost 1,000 monitoring sites that are sampled at least once a year. An example of the Rhin et Meuse agency's monitoring sites can be found in French.





Specificities in the data availability for regionalised RDPs

For Water Abstraction (I.10):

- Some regional RDPs have readily available regional estimates from their national statistical services.



Example: Spain

- Other regional RDPs should calculate values for the indicators as they are not readily available from Eurostat or through national sources:
 - One approach is to utilise WFD data on RBDs, especially when RBDs boundaries and administrative boundaries coincide.



Examples: Spain - Canary Islands, Finland - Åland

- Another approach is to utilise regional water coefficients from previous surveys (e.g. the 2010 SAPM) and apply them on the current regional data of cultivations by irrigation method.



Example: Italy

For Water quality (I.11 – GNB):

- Attempts to regionalise the GNB-N were undertaken by the JRC.



Example: EU-wide study by JRC

- Some countries have successfully attempted to regionalise GNB.



Example: Finland





Water Abstraction (I.10):



Spain: The Spanish 'Instituto Nacional de Estadística' (INE) maintains its own survey of water usage in the agricultural sector with a regional series for 2000-2016.



Spain - Canary Islands: The Spanish Canary Islands RDP coincides with RBD ES120 named Gran Canaria.



Finland – Åland: The Finish Åland RDP coincides with RBD FIWDA named Åland River Basin District.



Italy: A detailed study of irrigation water by region, type of cultivation and type of irrigation method based on the 2009-2010 SAPM was published in 2014.





Data availability for CMES indicators

Specificities

Example(s)

For Water quality (I.11 – GNB):



EU-wide study by the Joint Research Center in 2015, 'Regionalisation of Nitrogen Balances with the CAPRI Model'.



A pilot study in Finland by Salo, et al. in 2015, 'Improving calculation of NP excretion and fertiliser use statistics'.





Data availability for selected additional indicators

The Water Exploitation Index (WEI) and the Regional Water Exploitation Projection (RWEPP).

Data available:

- The WEI is a Sustainable Development Indicator (SDI) and presents the annual total fresh water abstraction differentiated by surface and groundwater as a percentage of its long-term average available water (LTAA) from renewable fresh water resources. The indicator is available with a long time series for almost all Member States.

 Note

- The RWEPP will be available through the JRC's new Knowledge Hub on Water and Agriculture

 Note



Examples of additional indicators: Guidelines *Assessing RDP achievements and impacts in 2019*, PART IV, Chapter 4.4, Section 4.4.1 'Additional indicators (examples)'





Data availability for selected additional indicators

Note(s)



The indicator assists the evaluator to examine whether agriculture operates in a water stressed area. Eurostat sets a warning threshold of 20% for non-stressed regions and a severe scarcity threshold occurring where the WEI exceeds 40%. Lower indicator values can be associated with lower pressure on groundwater resources.





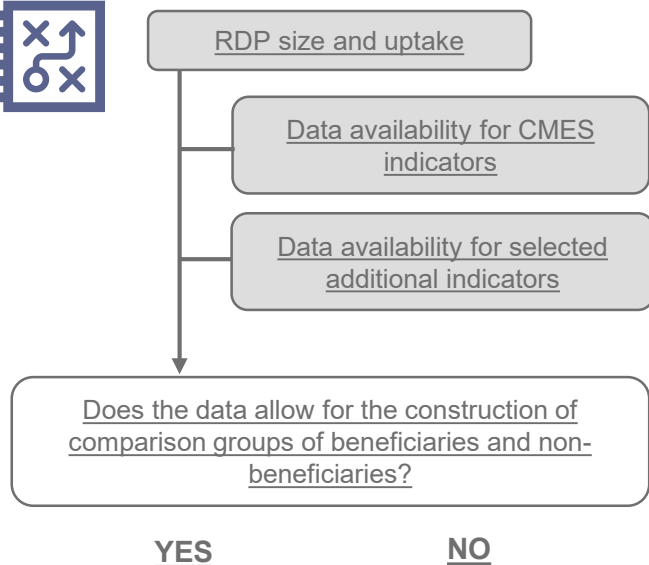
Data availability for selected additional indicators

Note(s)



Date of publishing is not yet announced by the JRC.





Does the data allow for the construction of comparison groups of beneficiaries and non-beneficiaries?

Why is this question important?

What are the conditions in order to answer the question with YES?

Are there any specificities to be considered for regionalised RDPs?

What can be done to improve the data situation?

Short-term solutions (for AIR 2019)

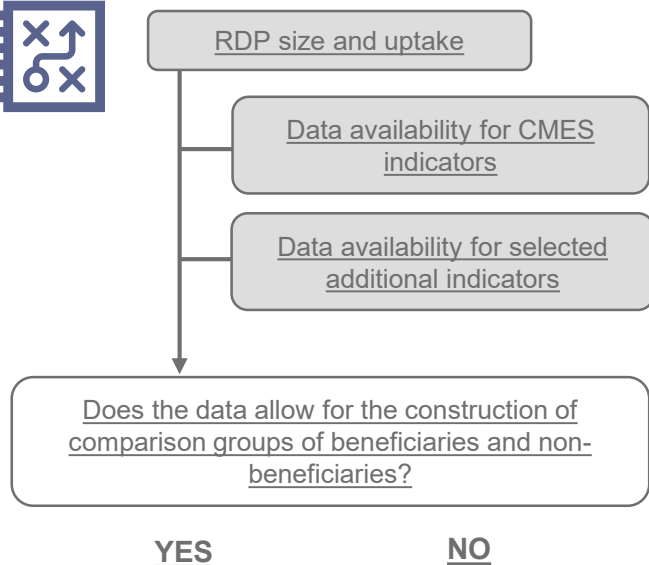
Long-term solutions (for ex-post)



Guidelines *Assessing RDP achievements and impact in 2019*, PART II, Chapter 2.1 and 2.6 and PART IV, Chapter 4.4.

Guidelines *Assessment of RDP results*, Chapter 2.1 and 6.2, and Annex 11, Chapter 2.9.

Guidelines for the ex post evaluation of 2007-2013 RDPs, Chapter 4.3



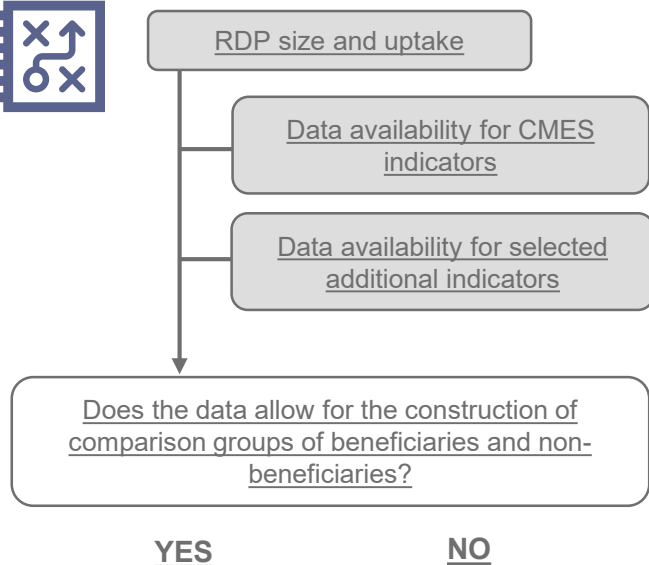
Does the data allow for the construction of comparison groups of beneficiaries and non-beneficiaries?

Why is this question important?

The ability to construct comparison groups is vital for choosing which methods will allow one to net out the RDP's effects.

At the micro-level there are no readily available databases for agricultural holdings and therefore the evaluator will have to construct a database for evaluating the RDP's impacts on I.10 and I.11 (GNB). The data of Monitoring Sites for I.11 (Nitrates in freshwater) is provided in a [spatial shapefile](#) (GIS format).





Does the data allow for the construction of comparison groups of beneficiaries and non-beneficiaries?

What are the conditions in order to answer the question with YES?

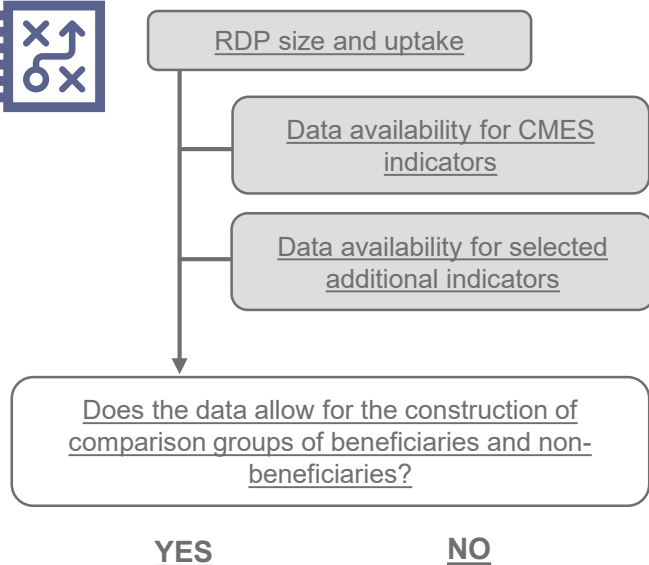
For water abstraction in agriculture (I.10) and water quality (I.11 - GNB) the main condition is to create the database through a very careful sampling procedure to reflect the RDP's intervention logic and its spatial coverage. The database should contain the following information to facilitate the construction of comparison groups:

- ✓ Representative sample of beneficiaries (identified from the CMES operations database).
- ✓ Correspondingly representative sample of non-beneficiaries.
- ✓ A reliable and consistent measurement of the indicator (I.10 and/or I.11-GNB) at the agricultural holding level (i.e. a way to measure the volume of irrigation water and GNB applied to all sampled units).
- ✓ A record of key agricultural holdings' characteristics to be used for screening out non-beneficiaries which cannot serve as matching variables when constructing the counterfactual. Furthermore, these variables should not be used as 'control' variables for simple regression analysis.

Evaluators should have the capacity to measure the indicator at the agricultural holding level.

Options for the construction of comparison groups.





Does the data allow for the construction of comparison groups of beneficiaries and non-beneficiaries?

What are the conditions in order to answer the question with YES?

Options

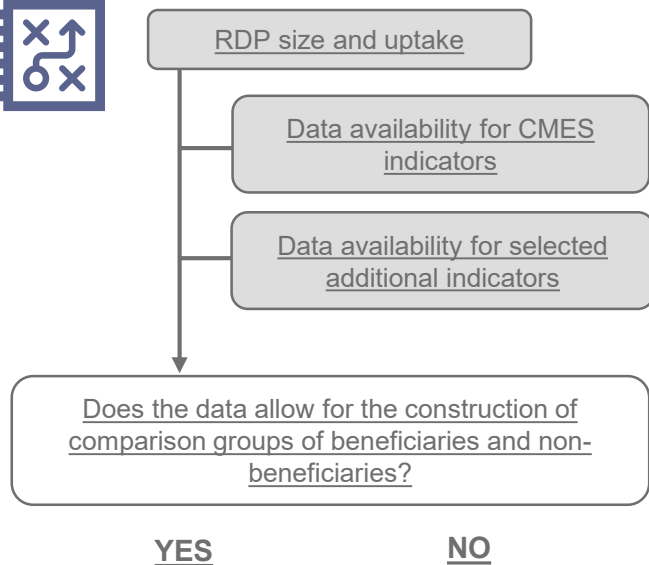
- Ask beneficiaries to provide the information on the estimation of potential water savings or reduction in applied fertilisers after the project implementation in **the application form** (operations database) or the business plan attached to it. In cases the magnitude of 'potential' water savings or 'potential' fertiliser reductions is part of the application's ranking procedure, the figures may be 'inflated'.
- Link both supported and non-supported agricultural holdings with a database that measures water consumption either directly (irrigation water providing agencies) or indirectly (agricultural electricity providers) (Example: [Greece](#)). For GNB this is less straightforward, however, agricultural holdings keep records of fertiliser inputs (purchase and own) and outputs (sales) either as part of cross-compliance or as part of national obligations (Example: [Denmark](#)). An issue may arise in areas where agricultural holdings depend on self-sources (not on public water providers) and/or use energy sources other than electricity.
- Measure irrigation water and fertilisation needs using a simulation software. Many Member States used simulation methods when the SAPM was carried out in 2010 in order to avoid the collection of 'subjective' data, which could be caused by imprecise measurements from unusual weather conditions (in the preceding 12 months) prior to the survey or a poor recollection of events based on the farm holder's memory. An example of this can be seen in [Italy](#).

The FAO's [AquaCrop](#) and [CropWat](#) simulation softwares are both popular among agronomists and consultants.

Similar simulation software has been developed for nutrients and GNB in the [UK](#).

 Note





Does the data allow for the construction of comparison groups of beneficiaries and non-beneficiaries?

What are the conditions in order to answer the question with YES?

Options

Example(s)

Several local and general land reclamation agencies in Greece have online georeferenced data for agricultural holdings, owners/managers, plots and water infrastructure:

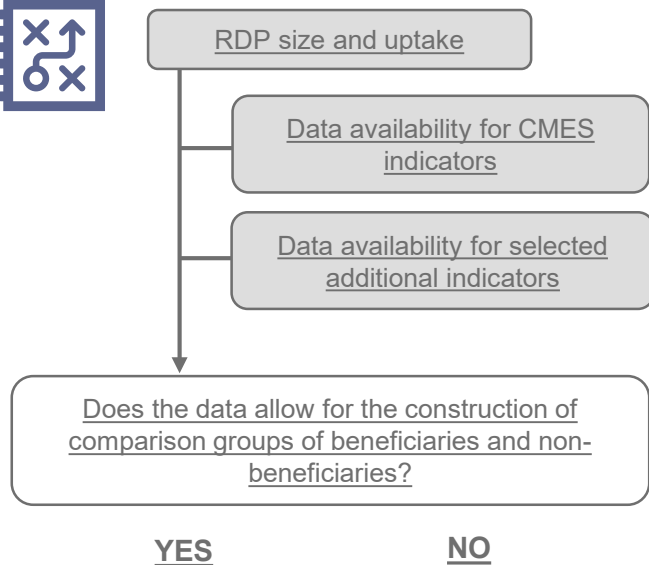


The irrigation network near the Greek town of Serres (in Greek).



The irrigation network linked to arable plots at Nigrita, Greece (in Greek).





Does the data allow for the construction of comparison groups of beneficiaries and non-beneficiaries?

What are the conditions in order to answer the question with YES?

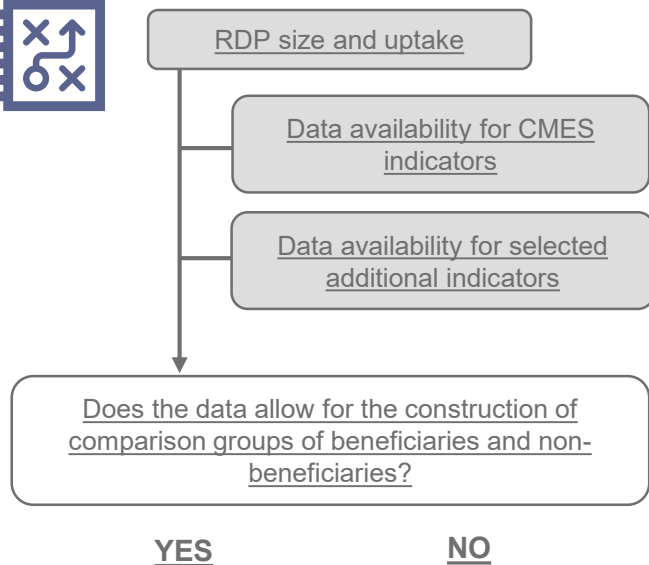
Options

Example(s)



Denmark maintains livestock manure and fertiliser accounting systems.





Does the data allow for the construction of comparison groups of beneficiaries and non-beneficiaries?

What are the conditions in order to answer the question with YES?

Options

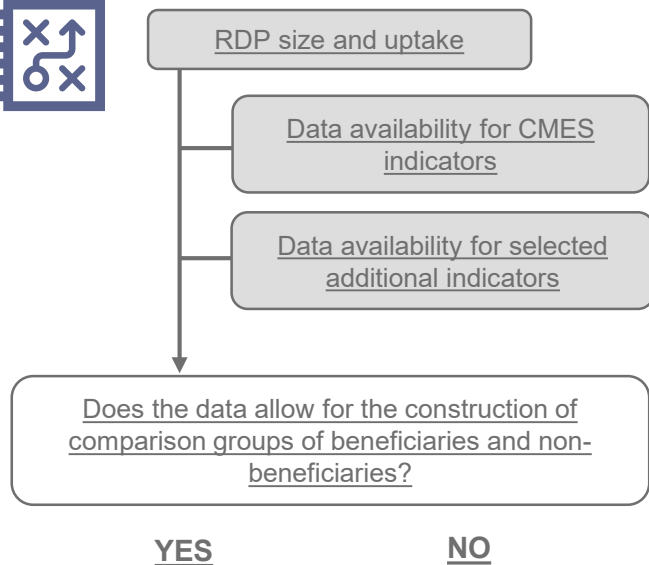
Example(s)



In 2008, Eurostat awarded grants to 13 European Member States to develop methodologies for irrigation water consumption estimation that could be extended to all Member States. This necessity arose from the EC-Regulation Nr.1166/2008 that binds all Member States to provide, for each holding surveyed with the Statistics on Agricultural Production Methods (SAPM), an estimation of irrigated water consumption measured in cubic metres.

Italy created the MARSALa model, which was calibrated with a sample of about 300 farms located in four Italian regions (Campania, Sardinia, Emilia-Romagna and Puglia) to ensure the representativeness of the main Italian agricultural characteristics.





Does the data allow for the construction of comparison groups of beneficiaries and non-beneficiaries?

What are the conditions in order to answer the question with YES?

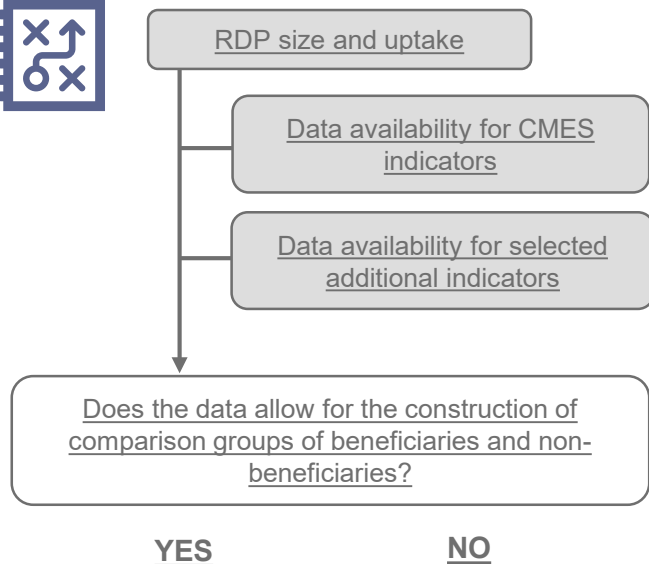
Options

Example(s)



The Department for Environment Food and Rural Affairs (DEFRA) and the Scottish Government in the **UK** have developed PLANET and MANNER-NPK for the management of manufactured fertiliser and organic manure nutrients (e.g. nitrogen, phosphate, potash, sulphur and lime) applied to land.





Does the data allow for the construction of comparison groups of beneficiaries and non-beneficiaries?

What are the conditions in order to answer the question with YES?

Options

Note(s)



For water quality (I.11 - Nitrates in freshwater) the database of Monitoring Sites probably will not allow for the construction of comparison groups. This is due to the fact that the status of water (ecological and chemical) and the concentration of nitrates in a surface and/or groundwater monitoring site is determined by many factors (biotic and abiotic) outside agriculture and within agriculture that is difficult to control. However, if the evaluator can establish a fair control over monitoring sites and can utilise an extensive network of monitoring sites, the database may allow for the construction of comparison groups.

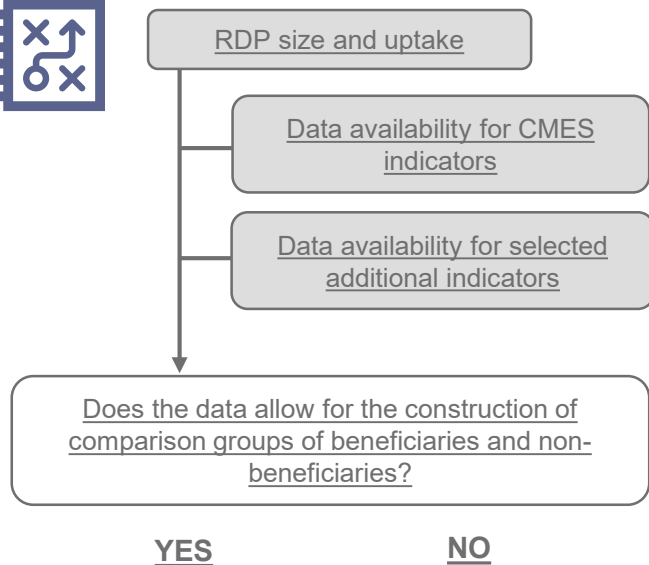
At the macro level comparison groups may be constructed at the level of smaller spatial units (NUTS 3 or NUTS 4) if data is available.



Example:

- Germany





Does the data allow for the construction of comparison groups of beneficiaries and non-beneficiaries?

What are the conditions in order to answer the question with YES?

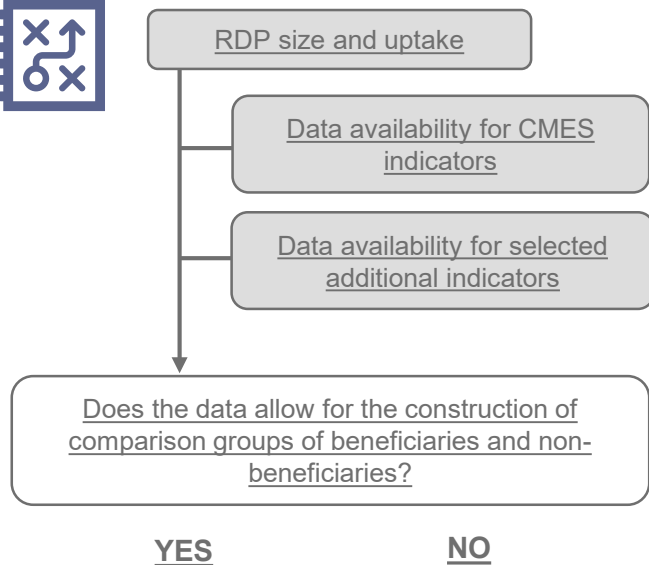
Note(s)

Example(s)



In Germany, the Regionalised Agriculture and Environmental Information System (RAUMIS) incorporates a nutrient balance model and detailed information on at least 430 regions.



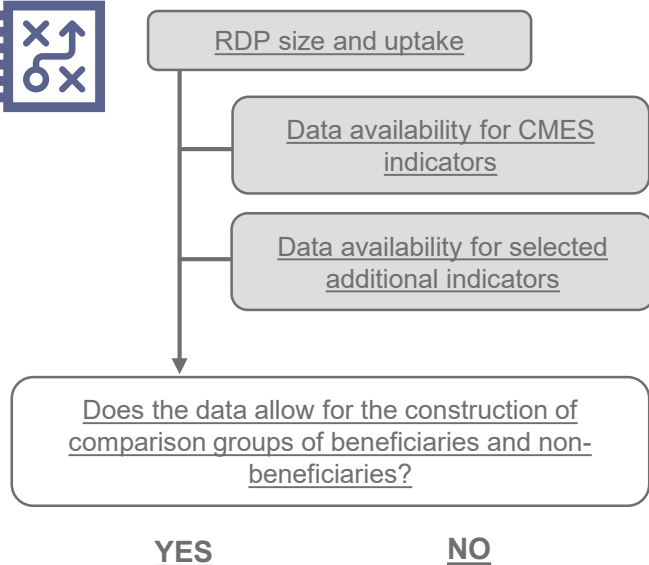


Does the data allow for the construction of comparison groups of beneficiaries and non-beneficiaries?

Are there any specificities to be considered for regionalised RDPs?

There are no specificities for regionalised RDPs.





Does the data allow for the construction of comparison groups of beneficiaries and non-beneficiaries?

What can be done to improve the data situation?

Short-term solutions (for AIR 2019)

Since data on supported agricultural holdings is available through the operations database in 2019, data on non-supported agricultural holdings can be retrieved from other existing sources or through the database of irrigation water associations or on farm bookkeeping data. These sources should include either the estimate of the impact indicator or collect data to calculate it.

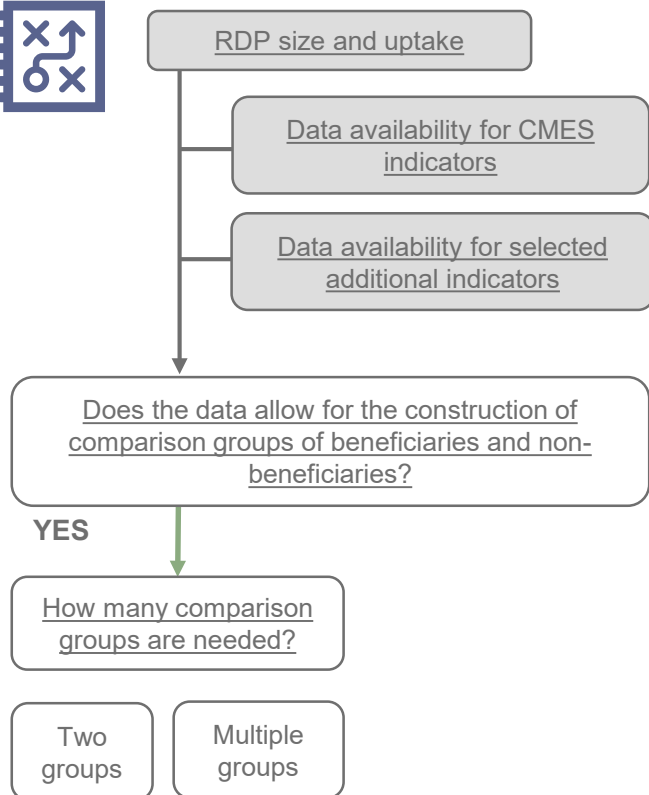
These databases and sources include:

- Data kept by irrigation water or rural electricity providers from which non RDP supported holdings can be identified;
- IACS;
- FADN combined with records on individual cultivations from which water for irrigation can be calculated;
- On farm cross-compliance records for GNB (as part of the IACS) or bookkeeping data for fertiliser and manure purchase, sales and consumption.

Long-term solutions (for ex-post)

A regular survey of agriculture (with quality of SAPM) should be considered for collecting data on all environmental indicators, which have data gaps. Such a survey can be coordinated with the Farms Structure Survey (FSS).





NEXT

How many comparison groups are needed?

Why is this question important?

What are the conditions in order to answer the question?

Are there any specificities to be considered for regionalised RDPs?

What can be done to improve the data situation?

Short-term solutions (for AIR 2019)

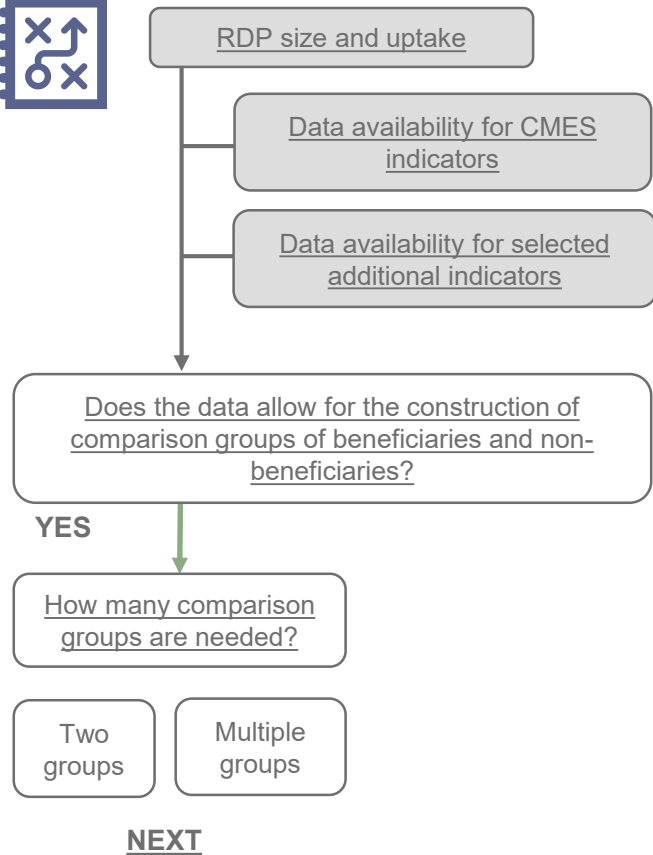
Long-term solutions (for ex-post)



Guidelines *Assessing RDP achievements and impact in 2019*, PART II, Chapter 2.1 and 2.6 and PART IV, Chapter 4.4.

Guidelines *Assessment of RDP results*, Chapter 2.1 and 6.2, and Annex 11, Chapter 2.9.

Guidelines for the ex post evaluation of 2007-2013 RDPs, Chapter 4.3

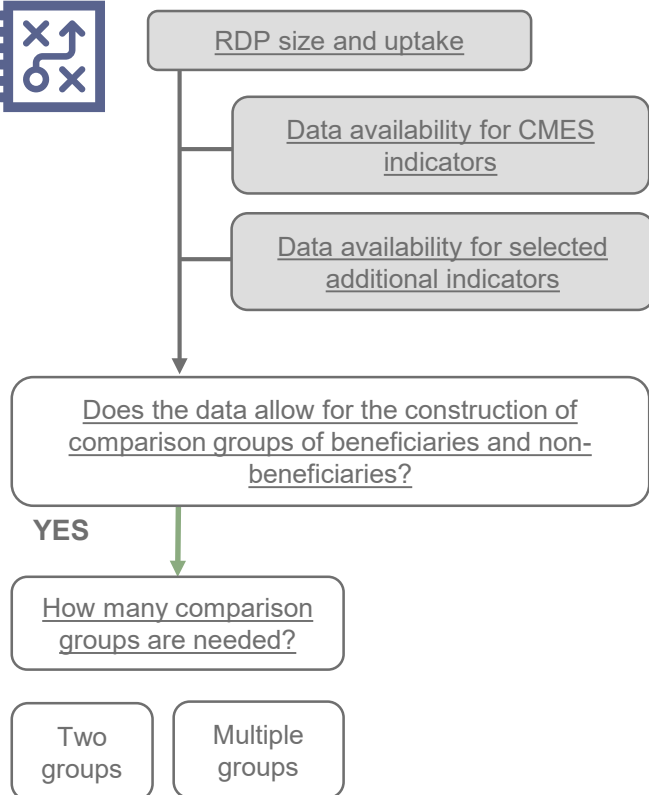


How many comparison groups are needed?

Why is this question important?

The number of comparison groups is important because it affects the sampling design and the surveys to be used. Both should be adapted to take into account multiple comparison groups.





NEXT

How many comparison groups are needed?

What are the conditions in order to answer the question?

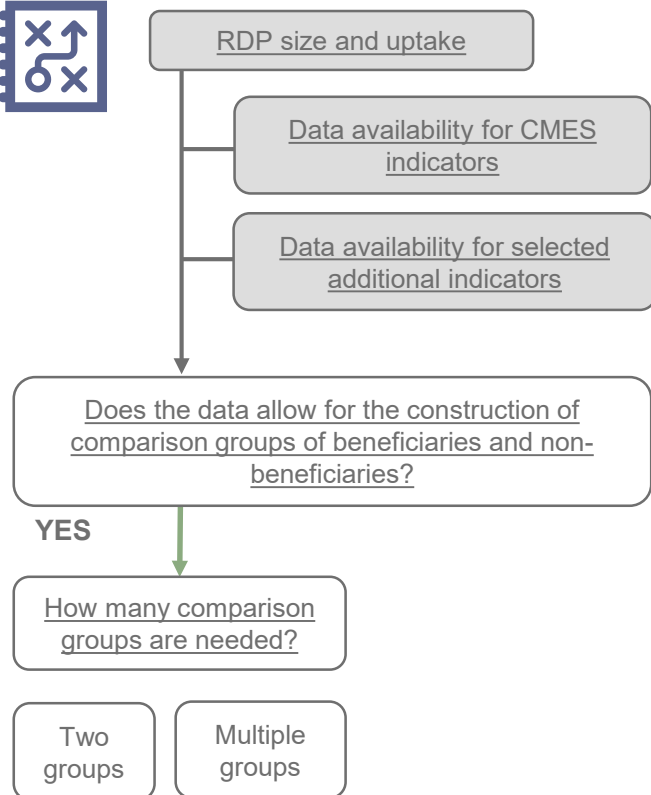
The number of comparison groups depends on the RDP's intervention logic and the aims and objectives of the evaluation. If the evaluation aims to estimate the direct effects of each measure aiming to reduce water abstraction or the use of fertilisers, then the comparison groups will be constructed accordingly. The conditions that will allow multiple groups to be constructed are:

- ✓ The ability to define and identify, very sharply, the groups to be created.
- ✓ Each comparison group needs to be adequate in size in order for a sample to be drawn.

Are there any specificities to be considered for regionalised RDPs?

There are no specificities for regional RDPs. However, regional RDPs may face a challenge due to the fact that they have small sample sizes due to either a small budget or a low uptake. If this is the case, the evaluator should re-consider the application of multiple comparison groups.





NEXT

How many comparison groups are needed?

What can be done to improve the data situation?

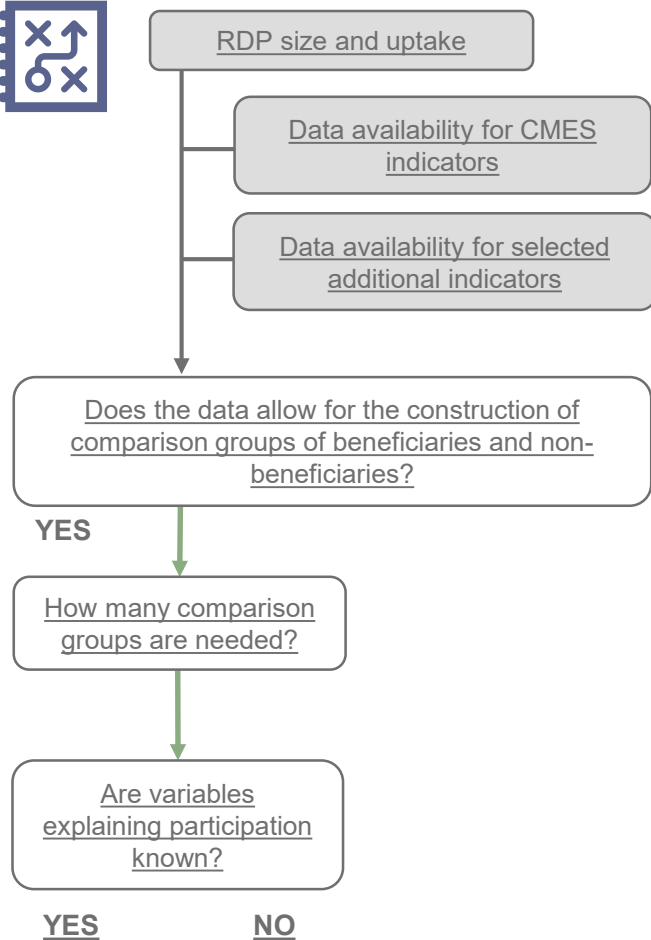
Short-term solutions (for AIR 2019)

If data on supported agricultural holdings is available in the operations database in 2019 and uptake is sufficient, the construction of multiple comparison groups should not be a problem. Data on non-supported agricultural holdings can then be retrieved from ready to use sources or databases.

Long-term solutions (for ex-post)

Regular surveys of agricultural holdings (similar in quality and structure to SAPM) should be considered. If multiple comparison groups are considered then the evaluation should pay attention to avoid double counting and ensure consistency of the indicator measurement.





Are variables explaining participation known?

Why is this question important?

What are the conditions in order to answer the question with YES?

Are there any specificities to be considered for regionalised RDPs?

What can be done to improve the data situation?

Short-term solutions (for AIR 2019)

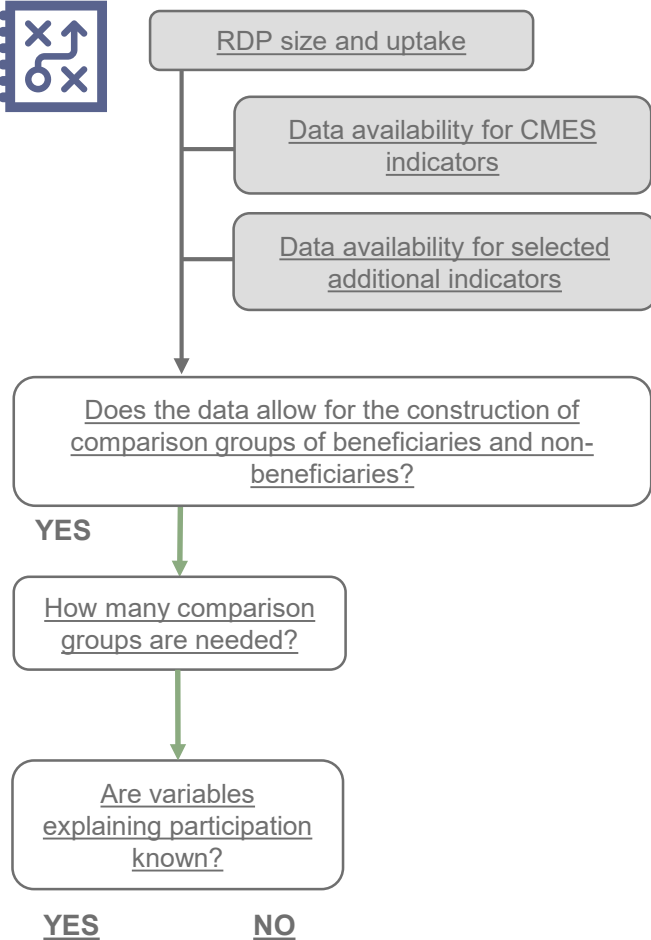
Long-term solutions (for ex-post)



Guidelines *Assessing RDP achievements and impact in 2019*, PART II, Chapter 2.1 and 2.6 and PART IV, Chapter 4.4.

Guidelines *Assessment of RDP results*, Chapter 2.1 and 6.2, and Annex 11, Chapter 2.9.

Guidelines for the ex post evaluation of 2007-2013 RDPs, Chapter 4.3



Are variables explaining participation known?

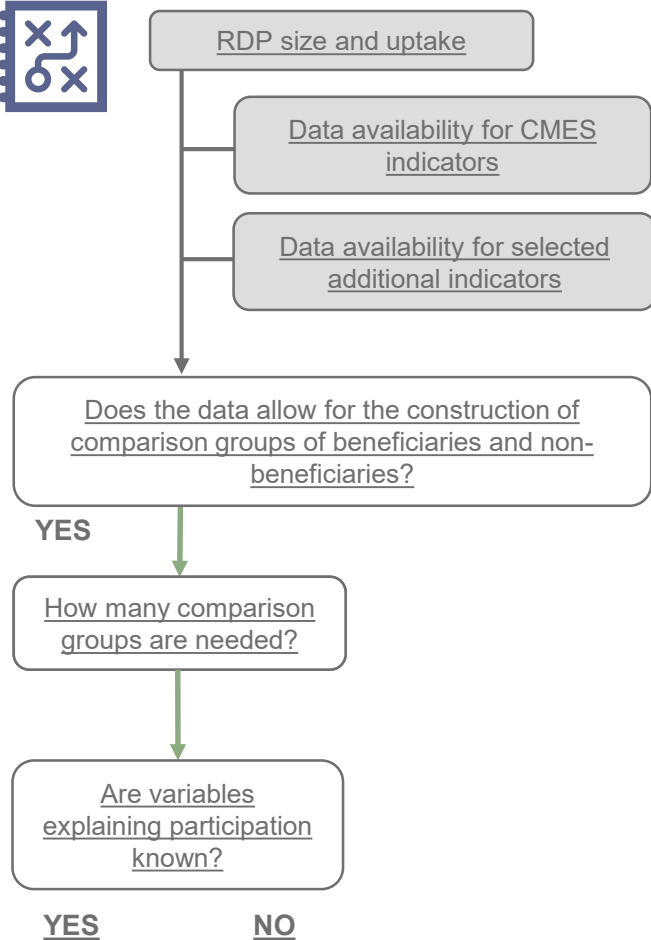
Why is this question important?

Identifying variables explaining participation is important since they will be used:

- to screen out non-supported holdings, which would not fulfil the eligibility criteria,
- to test the statistical similarity of the comparison groups, and
- as explanatory, matching or control variables in statistical analyses.

Variables should be known for all comparison groups.





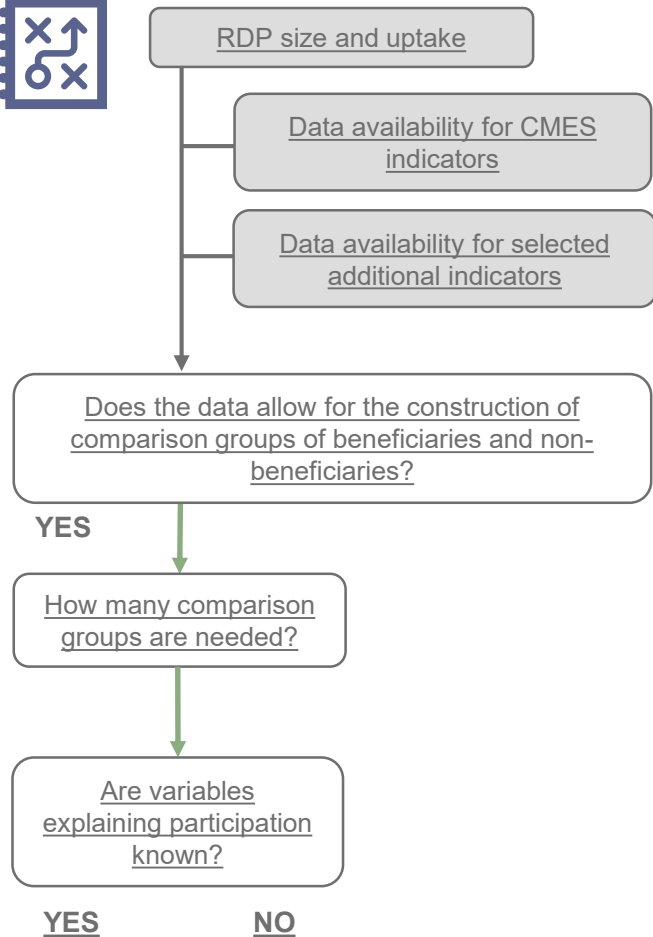
Are variables explaining participation known?

What are the conditions in order to answer the question with YES?

The main condition is that the survey of agricultural holdings should include all of the appropriate variables:

- ✓ Variables capturing the eligibility criteria, so that the sample of non-beneficiaries includes only potentially eligible units.
- ✓ Impact indicator (I.10, I.11) as variables consistently calculated across comparison groups.
- ✓ Variables explaining the participation/membership in a comparison group in case of multiple comparison groups.
- ✓ Variables recording the cultivations by area and irrigation methods, the important N and P inputs and outputs.
- ✓ Variables relevant to policy involvement such as the level of support received during the former programming period 2007-2013, and/or the level of support received from other public sources in this period, etc.
- ✓ Variables linked to the Type of Farm (TF), Economic Size Unit (ESU), other farm characteristics.
- ✓ Environmental variables such as the dominant soil type (from a soil map of the area).
- ✓ Owner/manager specific characteristics such as education, age, environmental certification, etc.
- ✓ Variables related to the involvement of owners/managers in Focus Area 1C measures - for beneficiaries only.



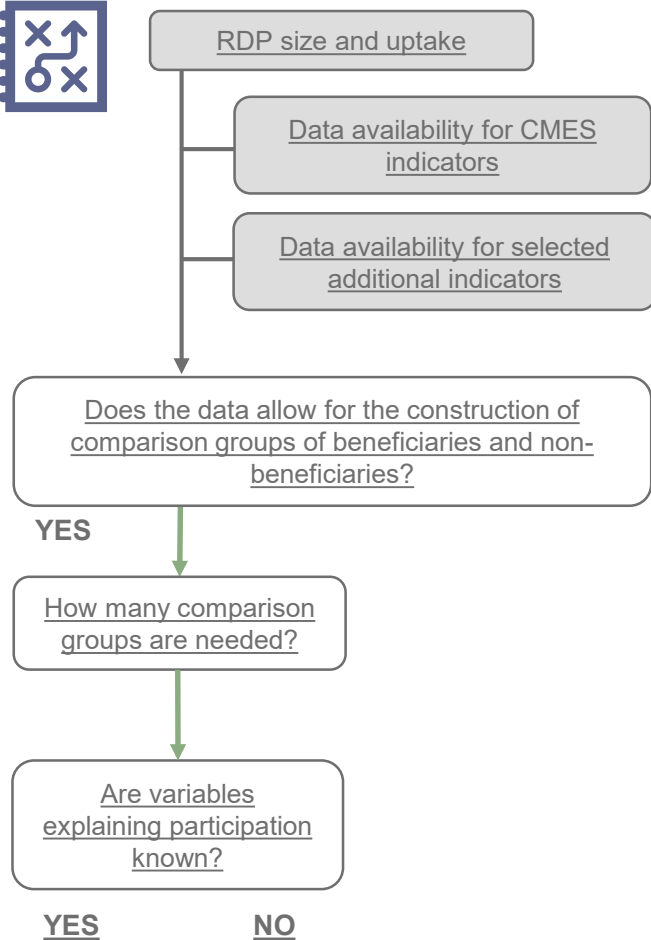


Are variables explaining participation known?

Are there any specificities to be considered for regionalised RDPs?

There are no specificities for regionalised RDPs.





Are variables explaining participation known?

What can be done to improve the data situation?

Short-term solutions (for AIR 2019)

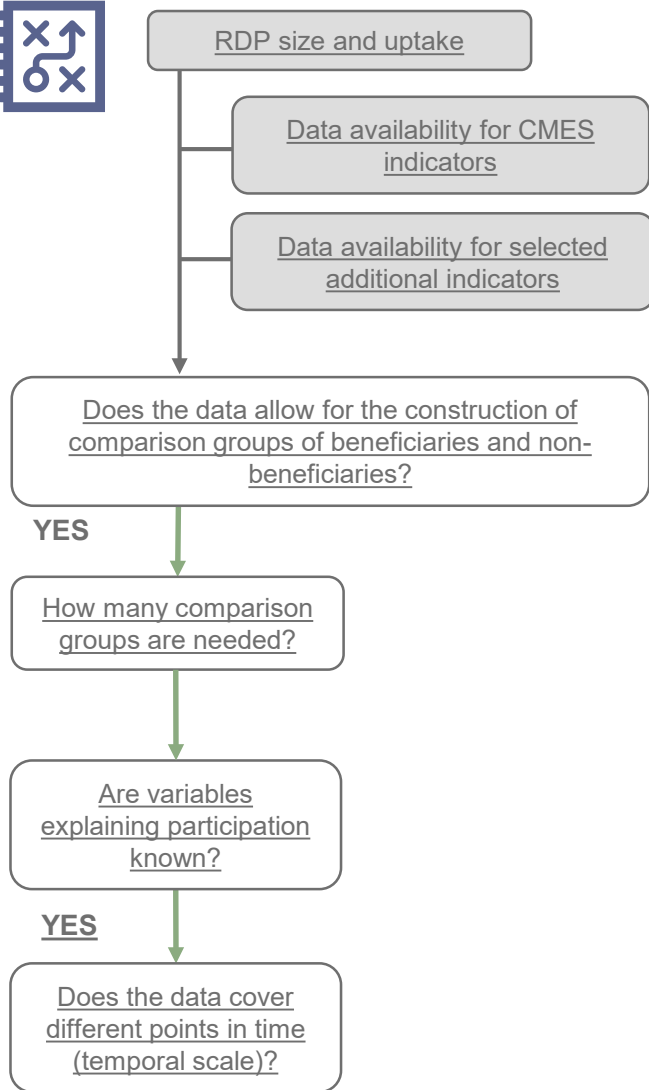
There are two issues to be considered for the assessment in 2019:

- Ensuring the quantity and quality of data available or that can be retrieved from the CMES operations database (e.g. application forms).
- Using the data from all available databases and data sources (FADN, irrigation water provision agencies or associations/cooperatives, etc.) from which the counterfactual can be built. Furthermore a plan should be devised on how to fill data gaps from these sources (data enrichment plan).

Long-term solutions (for ex-post)

Regular surveys of agricultural holdings which collect the data needed to assess those indicators (including those for variables) and ensuring that data collected from sampling units can be linked to other databases (e.g. FADN, IACS, and the database of irrigation water provision agencies). The construction of interlinked databases will serve to minimise the sampling effort and costs, while at the same time maximising data availability.





YES before-and-after & with-and-without

NO with-and-without

Does the data cover different points in time (temporal scale)?

Why is this question important?

What are the conditions in order to answer the question with YES?

Are there any specificities to be considered for regionalised RDPs?

What can be done to improve the data situation?

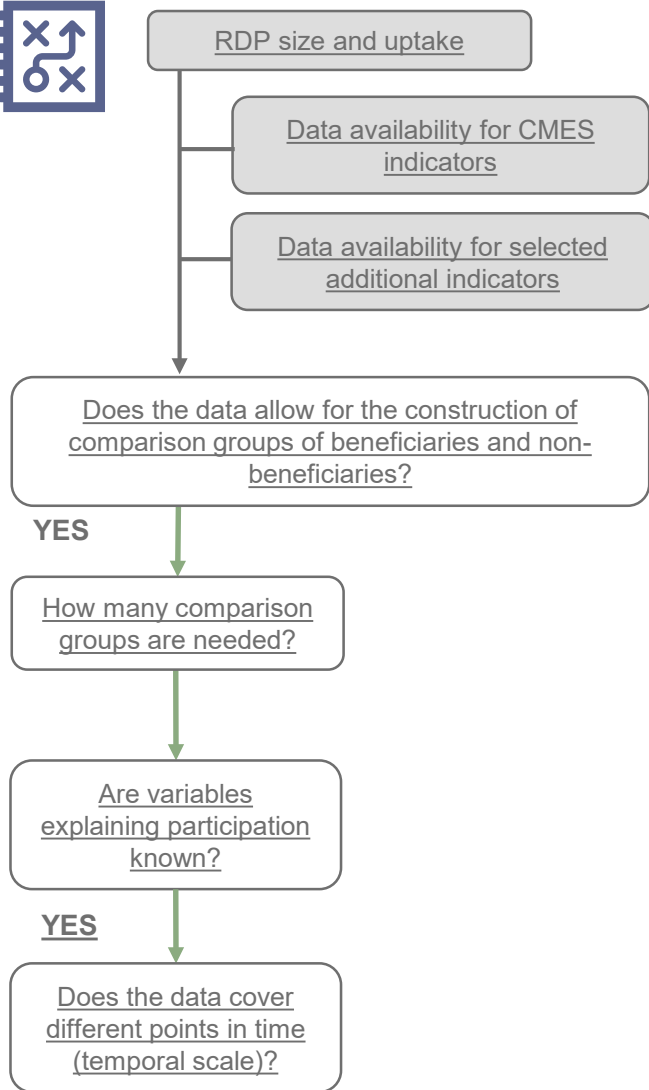
Short-term solutions (for AIR 2019)

Long-term solutions (for ex-post)



Guidelines *Assessing RDP achievements and impact in 2019*, PART II, Chapter 2.1 and 2.6 and PART IV, Chapter 4.4.

Guidelines *Assessment of RDP results*, Chapter 2.1 and 6.2, and Annex 11, Chapter 2.9.
 Guidelines *for the ex post evaluation of 2007-2013 RDPs*, Chapter 4.3



YES before-and-after & with-and-without

NO with-and-without

Does the data cover different points in time (temporal scale)?

Why is this question important?

The evaluator should know if the data covers different points in time or at least the situation before (baseline situation), during and after support time periods. The evaluator will then be able to address questions related to the RDP's effects for the whole programming period and complement statistical models with Differences in Difference (DiD).

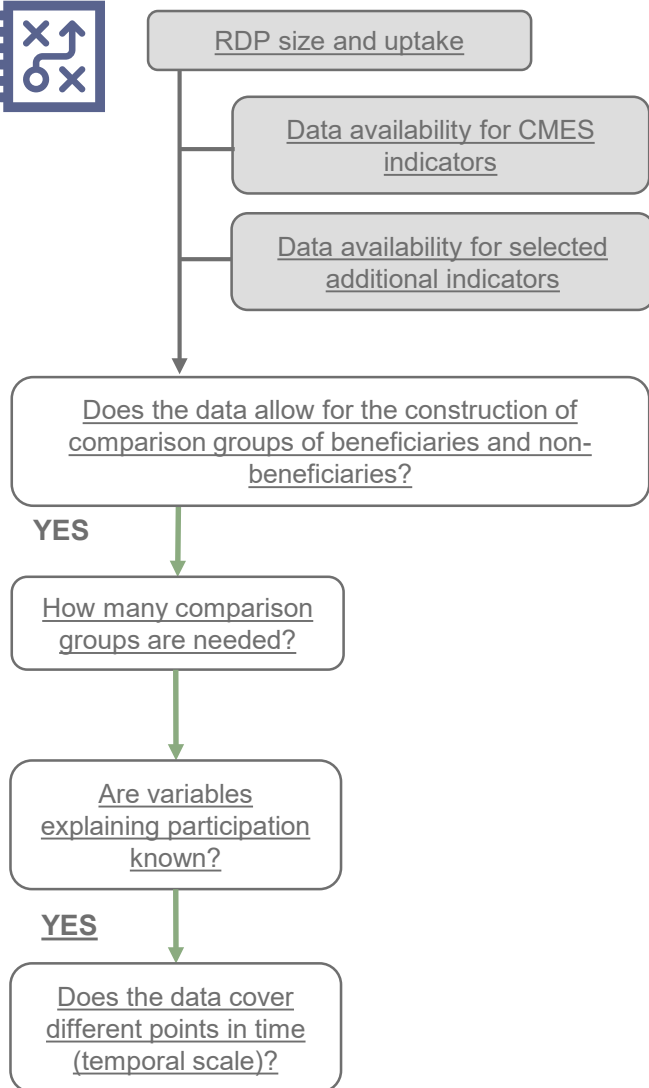
What are the conditions in order to answer the question with YES?

The main condition is to repeat the survey of agricultural holdings several times, at least before, during and/or at the end of the programming period, in order to ensure the temporal scale.

Are there any specificities to be considered for regionalised RDPs?

There are no specificities for regionalised RDPs.





YES before-and-after & with-and-without

NO with-and-without

Does the data cover different points in time (temporal scale)?

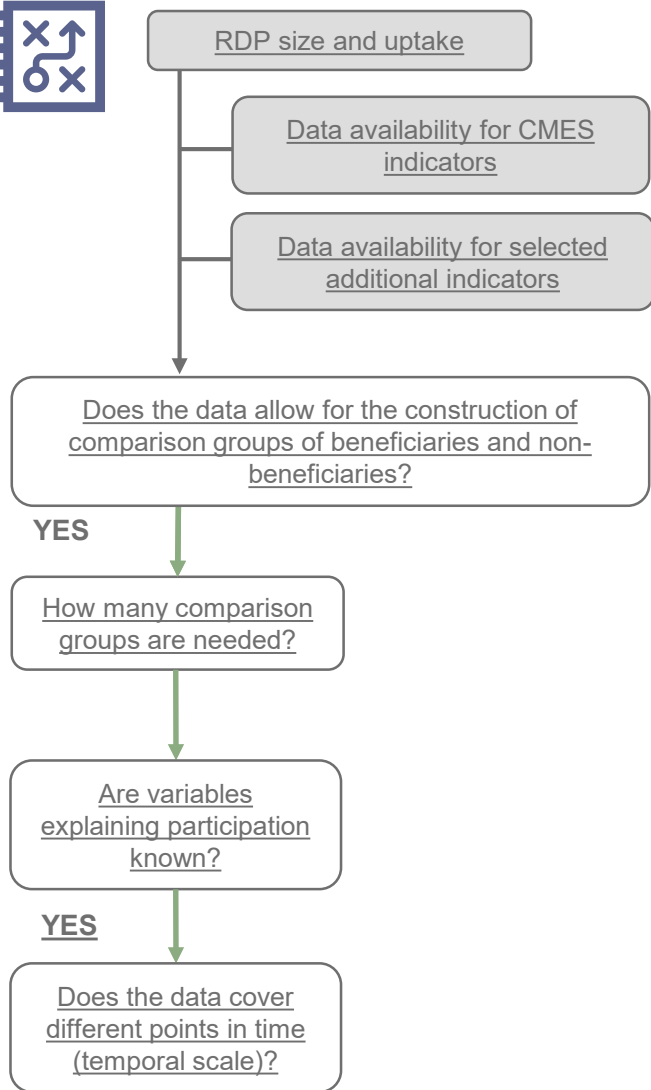
What can be done to improve the data situation?

Short-term solutions (for AIR 2019)

There are a few possibilities to collect data for different points in time for the assessment in 2019:

- Through the monitoring system for beneficiaries (application forms, payment requests, or monitoring tables, which are submitted before and after the project's implementation). This allows one to calculate the difference between the indicator's value before and its potential value after the support.
 - In case the application does not directly provide a numerical estimate of the indicator's change, it may define other changes that take place on the farm and therefore may allow for the indirect estimation of the indicator. For example, the application may not provide an estimate for the change in irrigated water or for applied fertilisers, but it may contain the information that a number of hectares from a specific cultivation were set aside in order to reduce water and fertiliser use. This may allow the evaluator to use a simulation software and approximate a change in the water abstraction indicator and the GNB.
- From water associations or energy providers (data on non-beneficiaries). Moreover, under certain conditions FADN can be used for different time periods.





YES before-and-after & with-and-without
NO with-and-without

Does the data cover different points in time (temporal scale)?

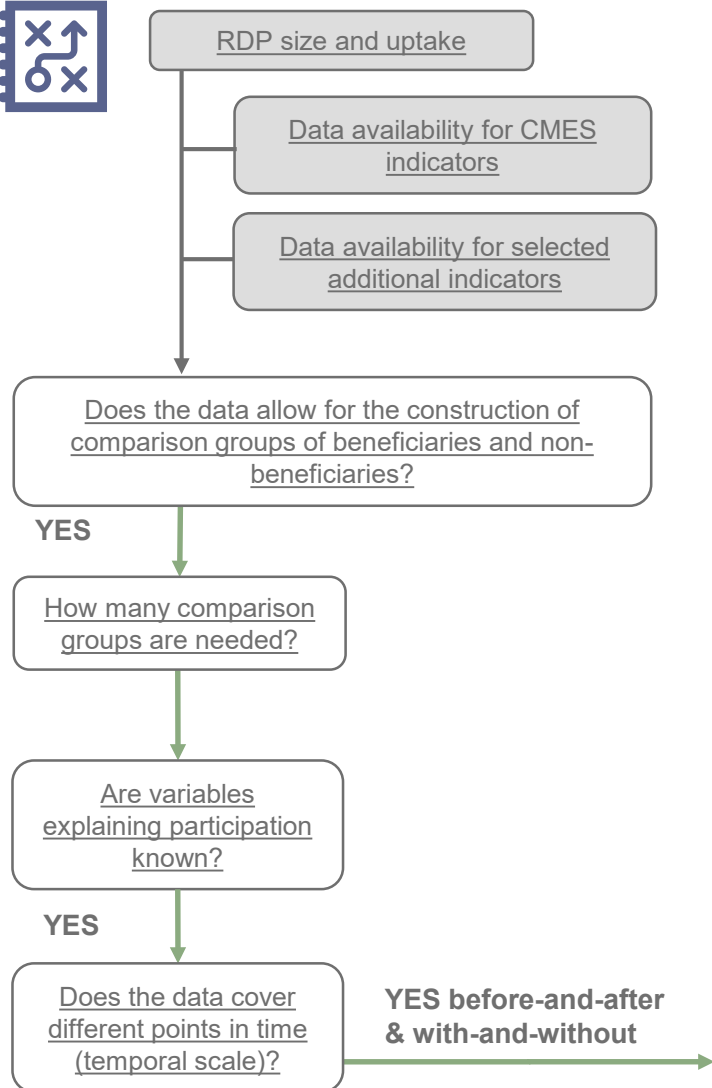
What can be done to improve the data situation?

Long-term solutions (for ex-post)

Regular surveys can be conducted two to three times during the programme's implementation (before, during, after) and can be used to provide a data timeline. Timeline data can support the evaluation to address questions related to:

- the long-term impacts of the RDP (at least on early beneficiaries);
- the difference between early and late beneficiaries;
- the indirect impacts since all measures will have been activated.





Regression and matching techniques and Difference in Differences



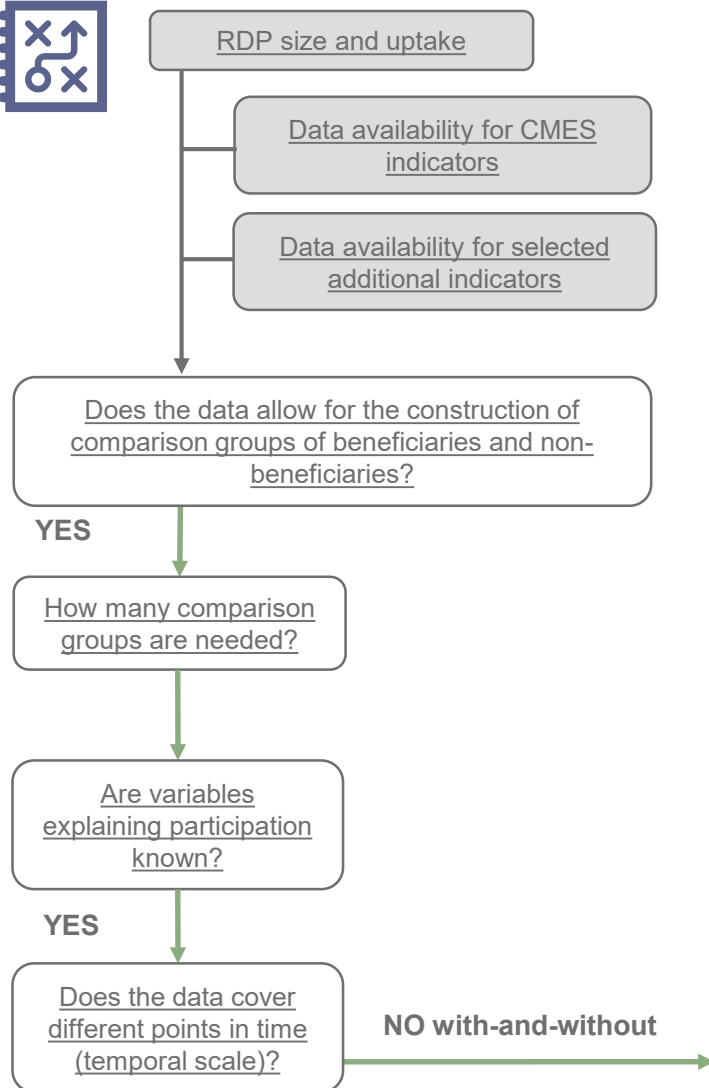
At the micro level, the assessment is first conducted at the level of the agricultural holding. Additional indicators should be used to assess water abstraction apart from irrigation purposes, total water abstraction and exploitation in agriculture. For the assessment of the RDP's effects on water quality, the effects from the use of fertilisers and pesticides should also be considered.

To net out these effects the guidelines suggest regression and matching techniques (Regression Techniques for ATT, Instrumental Variables, Matching Algorithms) with Difference in Differences, if data is available. Data for setting up a counterfactual within the approach for water abstraction and water quality 'GNB', can be drawn from a survey of agricultural holdings. This information can be complemented with existing agricultural holding data (FADN, national or regional databases from irrigation water providers, Single Area Payment data, etc.). For water quality 'Nitrates in freshwater', the use of a case study approach is recommended to net out the RDP's effects.

At the macro level (NUTS 3 or NUTS 4), if sufficient data exists, it is recommended to net out the effects using Generalised PSM or apply spatial econometric methods taking into account spatial autocorrelations among units.



Read more in guidelines *Assessing RDP achievements and impact in 2019*, PART II, Chapter 2.6.3 and PART IV, Chapter 4.4.2.



Regression and matching techniques

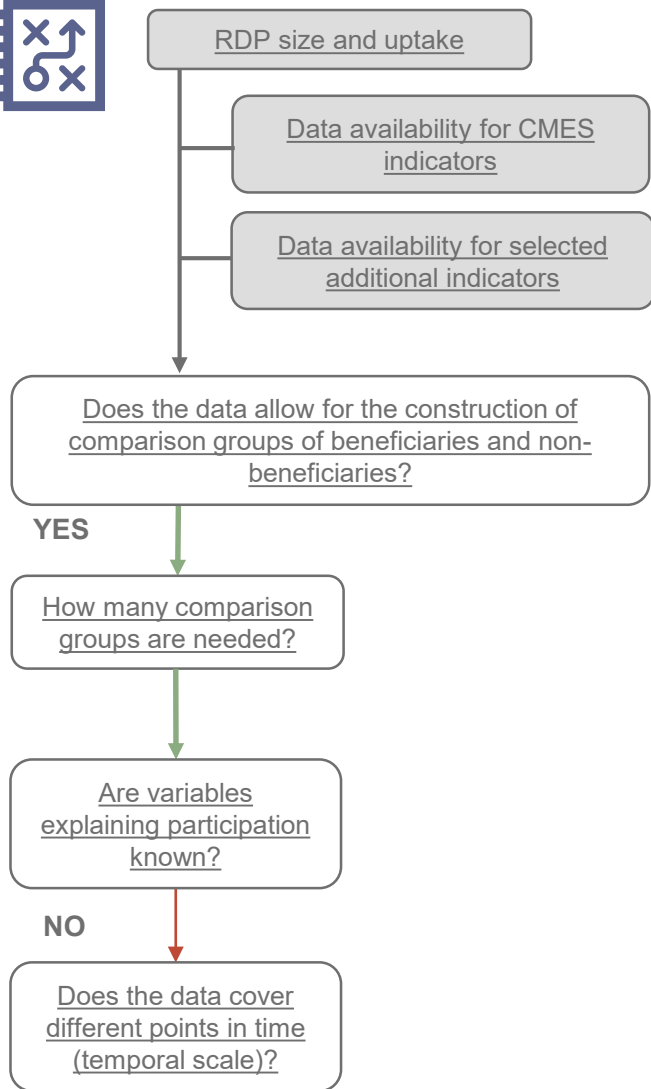
At the micro level, the assessment is first conducted at the level of the agricultural holding. Additional indicators should be used to assess water abstraction apart from irrigation purposes, total water abstraction and exploitation in agriculture. For the assessment of the RDP's effects on water quality, the effects from the use of fertilisers and pesticides should also be considered.

To net out these effects the guidelines suggest using a combination of regression and matching techniques (Regression Techniques for ATT, Instrumental Variables, Matching Algorithms) with the Difference in Differences, if data is available. Data for setting up a counterfactual, within this approach for water abstraction and water quality 'GNB', can be drawn from a survey of agricultural holdings or complemented by existing agricultural holding data (FADN, national or regional databases from irrigation water providers, Single Area Payment data, etc.).

At the macro level (NUTS 3 or NUTS 4) it is recommended to net out the effects using Generalised PSM or to apply spatial econometric methods that take explicit account of spatial autocorrelations among units, if sufficient data exists.



Read more in guidelines [*Assessing RDP achievements and impact in 2019*](#), PART II, Chapter 2.6.3 and PART IV, Chapter 4.4.2.



YES before-and-after & with-and-without

NO with-and-without

Does the data cover different points in time (temporal scale)?

Why is this question important?

What are the conditions in order to answer the question?

Are there any specificities to be considered for regionalised RDPs?

What can be done to improve the data situation?

Short-term solutions (for AIR 2019)

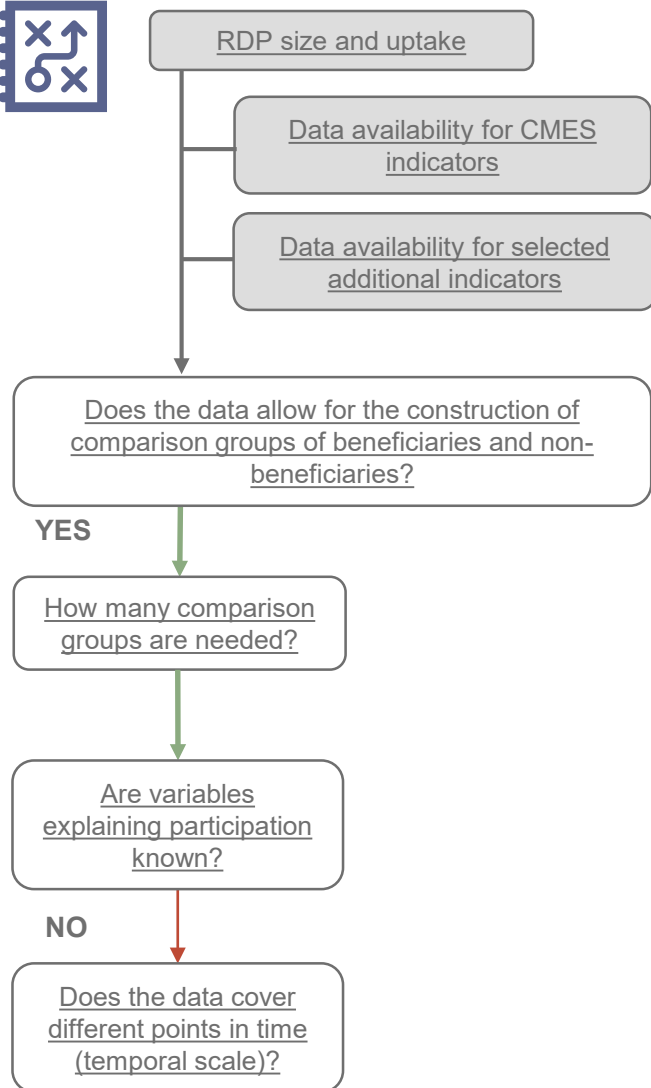
Long-term solutions (for ex-post)



Guidelines *Assessing RDP achievements and impact in 2019*, PART II, Chapter 2.1 and 2.6 and PART IV, Chapter 4.4.

Guidelines *Assessment of RDP results*, Chapter 2.1 and 6.2, and Annex 11, Chapter 2.9.

Guidelines for the ex post evaluation of 2007-2013 RDPs, Chapter 4.3



YES before-and-after & with-and-without **NO** with-and-without

Does the data cover different points in time (temporal scale)?

Why is this question important?

The effects of the RDP measures on water quality and abstraction can be correctly evaluated only if the baseline situation is established and the impact of RDP measures is assessed at the middle and the end of the programme. If the data covers different points in time and comparison groups can be constructed, then ad hoc and naïve comparisons with DiD can be used.

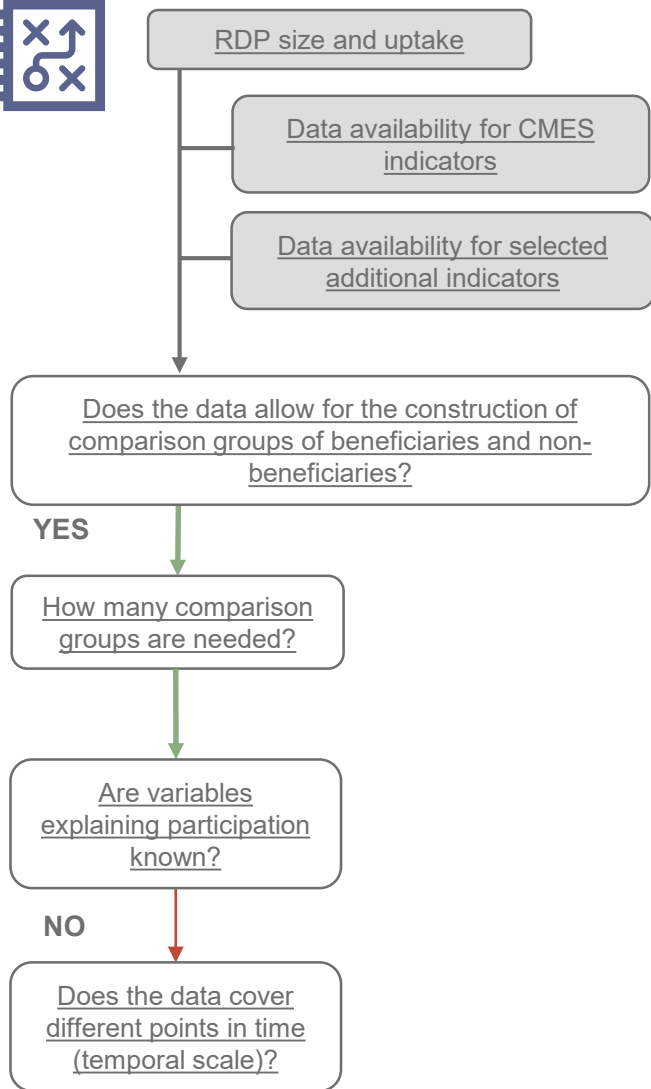
What are the conditions in order to answer the question?

Is the evaluator able to estimate the indicator for beneficiaries and non-beneficiaries at different points in time (at least before programme implementation and at the time of evaluation – during and after the programming period).

Are there any specificities to be considered for regionalised RDPs?

The suggested naïve approach is to compare the indicator for supported holdings with the population average. However, considering that in many regional RDPs the estimation of I.10 or I.11 (GNB), which is the numerator of the population average does not exist, the application of the naïve approach may face further obstacles. If an average for all non-beneficiaries can be estimated (i.e. total water abstraction for non-beneficiaries divided by the number of non-beneficiaries) then the average for beneficiaries can be compared to the average for non-beneficiaries.





YES before-and-after & with-and-without **NO** with-and-without

Does the data cover different points in time (temporal scale)?

What can be done to improve the data situation?

Short-term solutions (for AIR 2019)

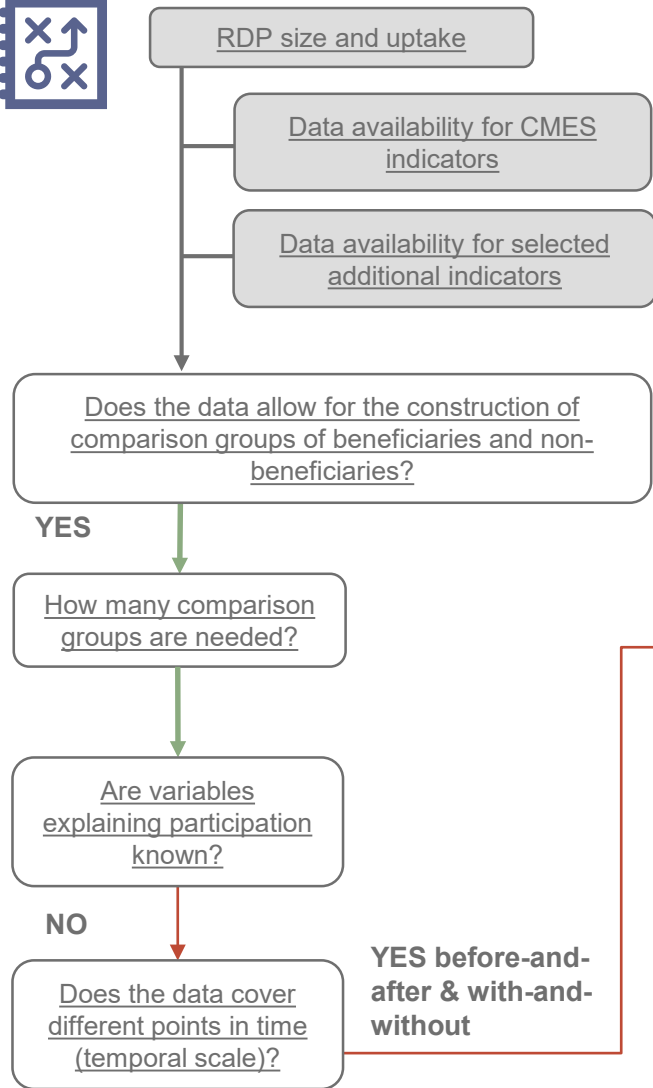
There are a few possibilities to collect data for different points in time for the assessment in 2019:

- Through the monitoring system for beneficiaries (application forms, payment requests, monitoring tables, which are submitted before and after the project implementation). Information in the monitoring system may allow the evaluator to calculate the indicator directly or indirectly.
- From water user associations and energy providers (data on non-beneficiaries). Under certain conditions FADN can be used for different time periods.

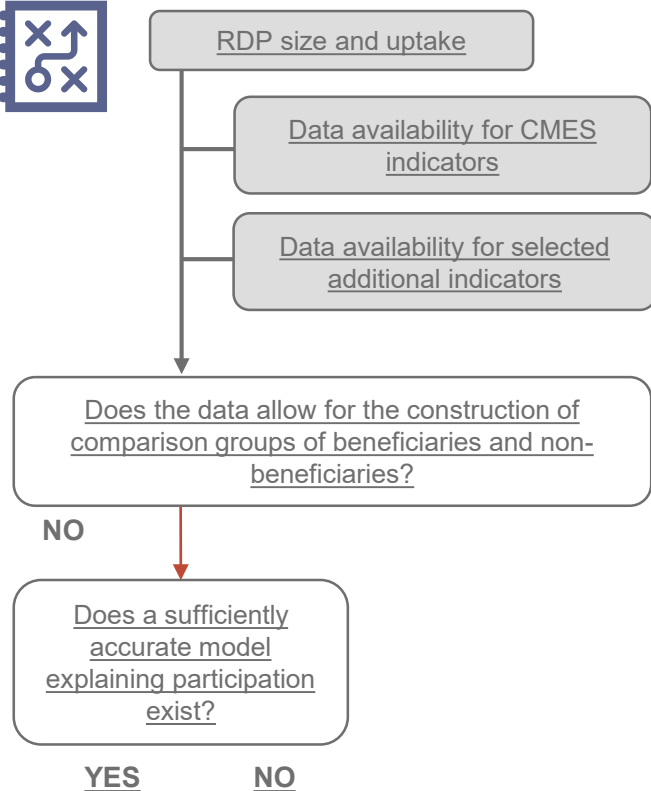
Long-term solutions (for ex-post)

Regular surveys which will allow the temporal construction and use of counterfactuals.





Other approaches:
Modelling approaches



Does a sufficiently accurate model explaining participation exist?

Why is this question important?

What are the conditions in order to answer the question with YES?

Are there any specificities to be considered for regionalised RDPs?

What can be done to improve the data situation?

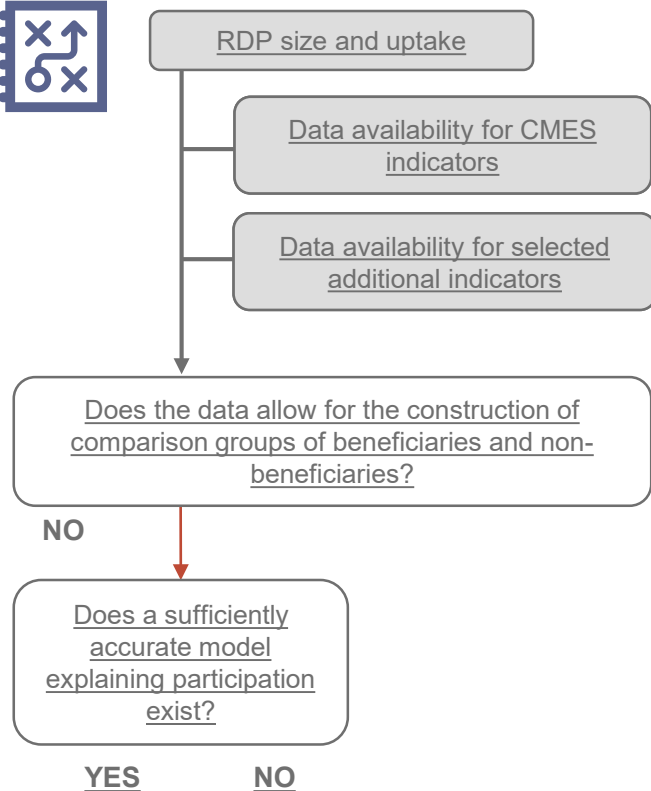
Short-term solutions (for AIR 2019)

Long-term solutions (for ex-post)



Guidelines *Assessing RDP achievements and impact in 2019*, PART II, Chapter 2.1 and 2.6 and PART IV, Chapter 4.4.

Guidelines for the ex post evaluation of 2007-2013 RDPs, Chapter 4.3.3.2



Does a sufficiently accurate model explaining participation exist?

Why is this question important?

If the data on monitoring sites does not allow for the construction of comparison groups then the evaluation can be carried out using a 'nutrient transportation' model for a typical watershed. It is important to know if such a model exists (i.e. it has been calibrated and is in operation).

What are the conditions in order to answer the question?

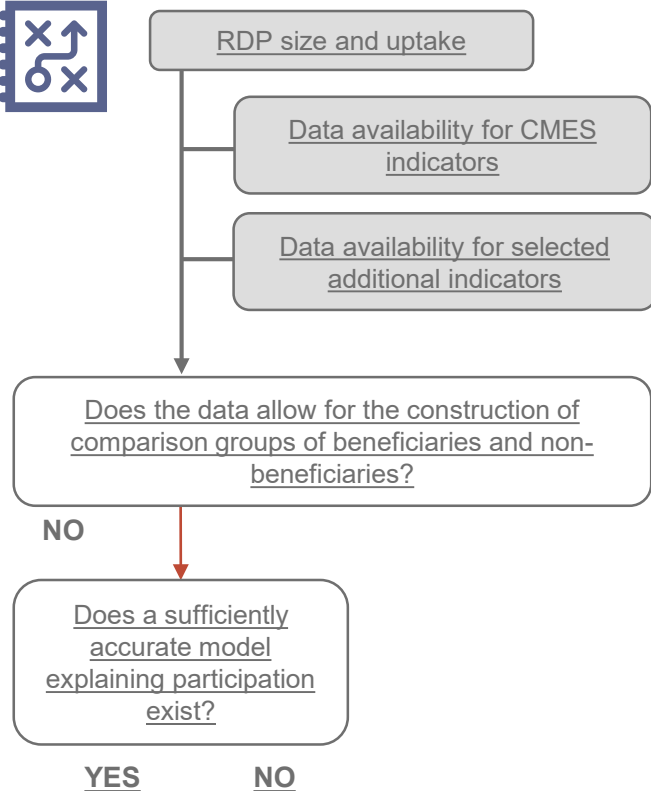
Does such a model exist? Such models could have been used in the past as part of academic research projects for Nitrate Vulnerable Zone monitoring programmes or others.



Examples:

- INCA-N,
- Greece,
- the Danube River Basin,
- Spain - Murcia





Does a sufficiently accurate model explaining participation exist?

What are the conditions in order to answer the question?

Example(s)



The INCA-N, SWAT and EPIC are examples of such simulation models: The INCA-N website at the University of Reading records 31 applications of the model in the UK, Finland, France, Germany, Romania, the Netherlands, Denmark and Spain.



In Greece, the INCA-N and INCA-P models were used to examine the effects of various agri-environmental scenarios on nitrate and phosphorus concentrations. Other distributed river basin models such as the SWAT and EPIC have been used in other case studies in Europe to quantify the impact of land management practices in large and complex watersheds.

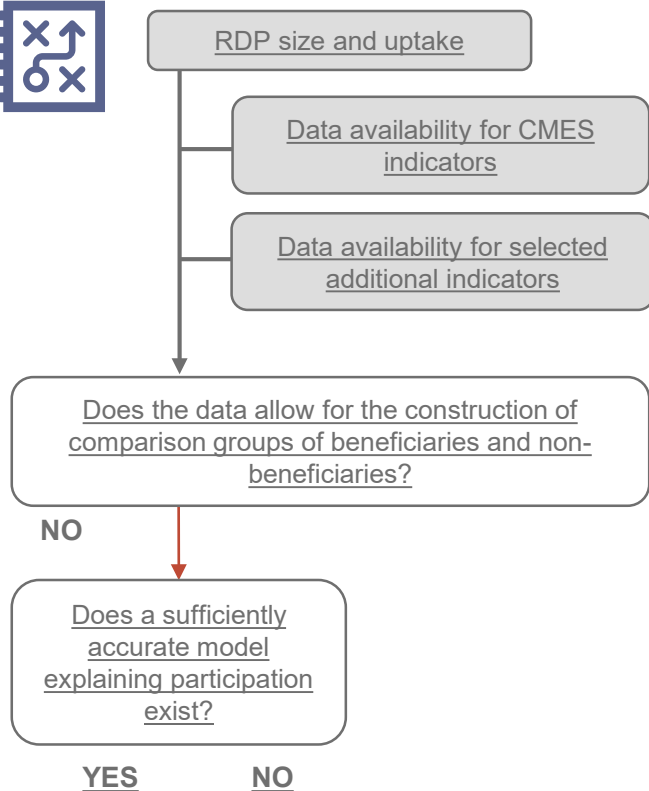


A recent study, models water and nutrient fluxes in the Danube International River Basin. This 'state-of-the-art' modelling of the water resources and nutrient pollution in the Danube River Basin offers an important step forward in large scale integrated modelling.



Other models have been specifically built for certain areas of scientific interest. For example, the hydrogeological modelling of groundwater discharge to the Mar Menor lagoon in Spain includes the Arco Sur-Mar Menor Irrigator Association (Arco Sur IA).





Does a sufficiently accurate model explaining participation exist?

Are there any specificities to be considered for regionalised RDPs?

There are no specificities for regionalised RDPs.

What can be done to improve the data situation?

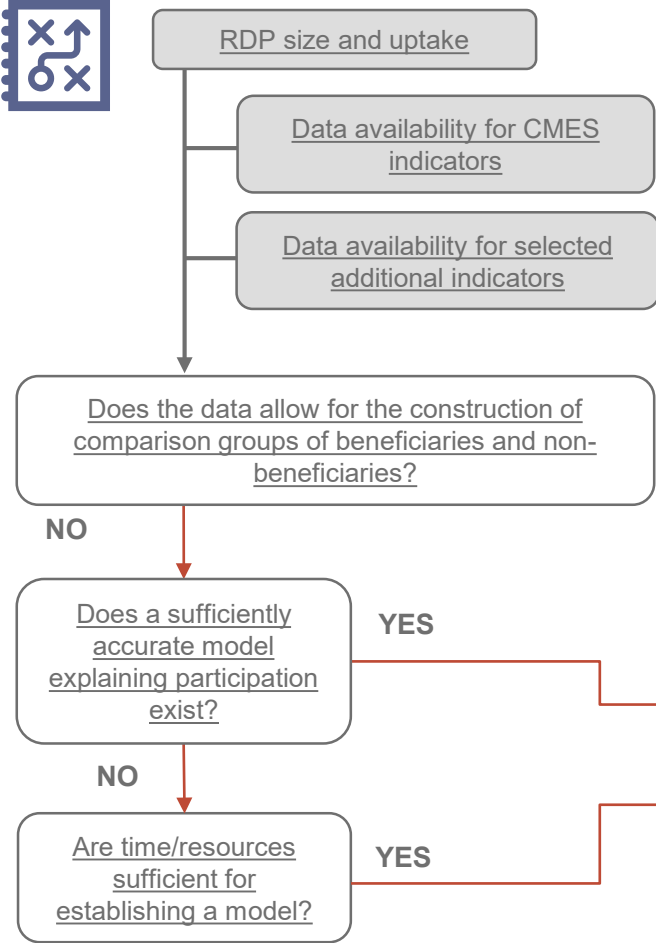
Short-term solutions (for AIR 2019)

The evaluator can use only a simulation model that is already calibrated and operational for the assessment in 2019.

Long-term solutions (for ex-post)

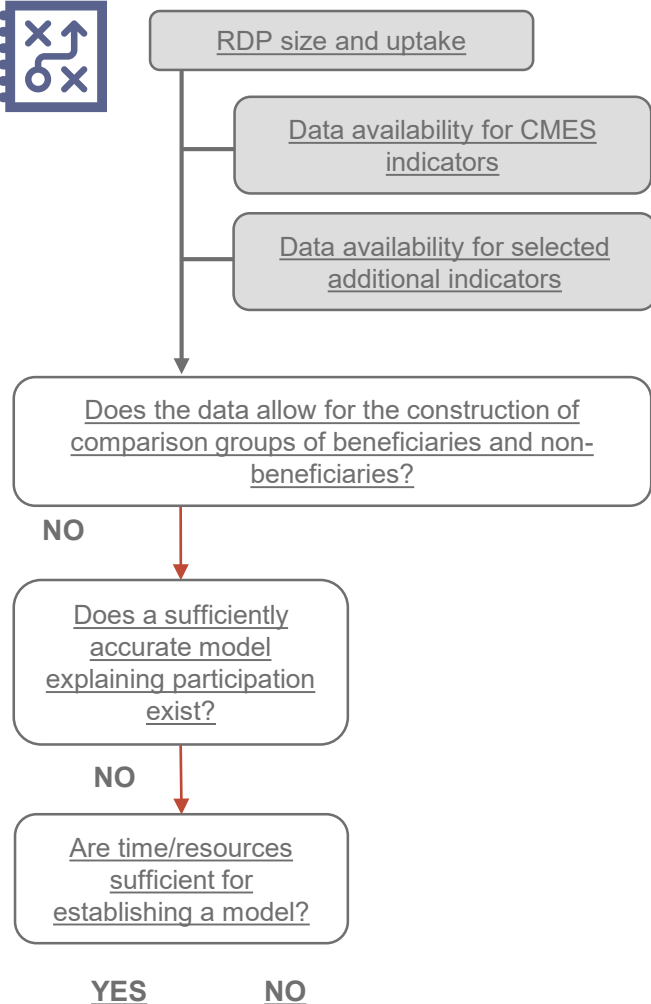
The evaluator should seek advice on utilising an existing catchment model or on building such a model to be used for various other obligations such as for reporting to the NVZ Directive.





Other approaches:

Simulation model for nitrates in freshwater



Are time/resources sufficient for establishing a model?

Why is this question important?

What are the conditions in order to answer the question with YES?

Are there any specificities to be considered for regionalised RDPs?

What can be done to improve the data situation?

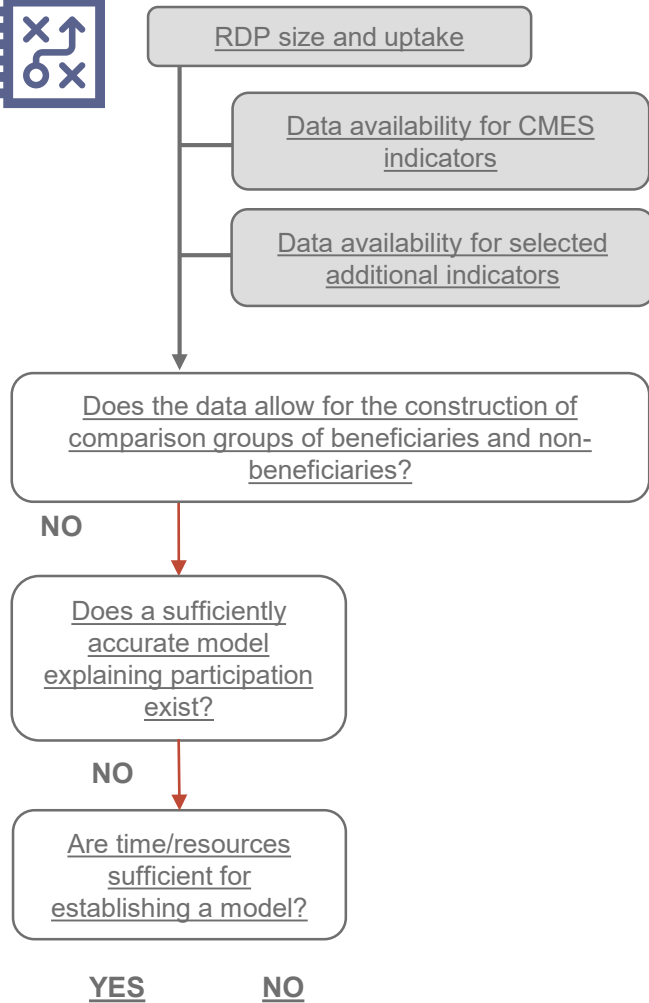
Short-term solutions (for AIR 2019)

Long-term solutions (for ex-post)



Guidelines *Assessing RDP achievements and impact in 2019*, PART II, Chapter 2.1 and 2.6 and PART IV, Chapter 4.4.

Guidelines for the ex post evaluation of 2007-2013 RDPs, Chapter 4.3.3.2.



Are time/resources sufficient for establishing a model?

Why is this question important?

This is an important question because 'nutrient transportation' models are very data demanding and time consuming and require an interdisciplinary team of experts. Therefore, if the model shall be constructed it is important to know if there is enough time and resources to do so.

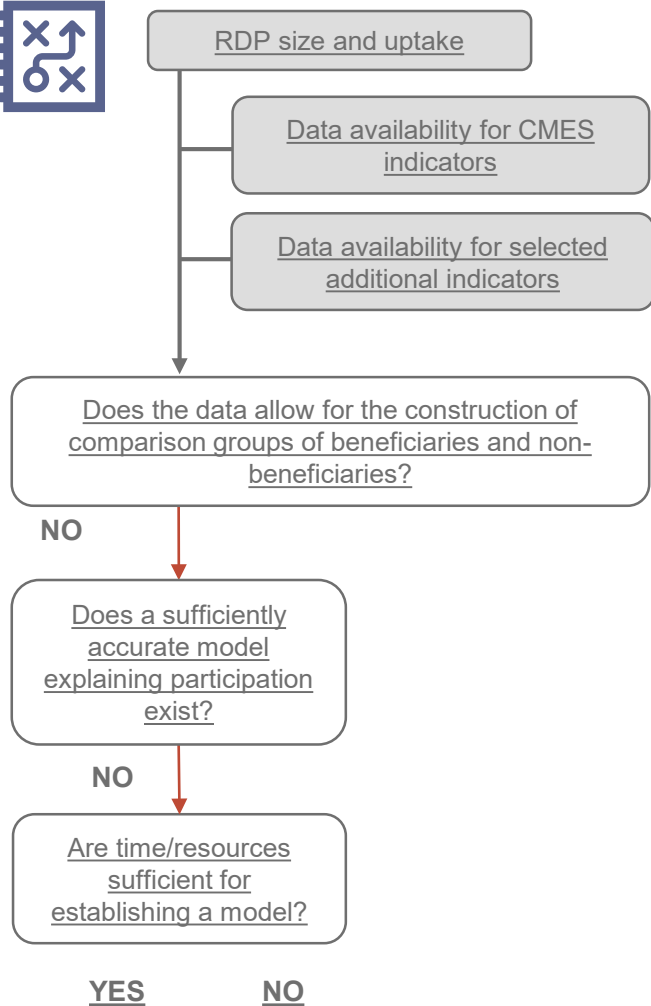
What are the conditions in order to answer the question with YES?

- ✓ Existence of data required by the model;
- ✓ Time and ability to produce estimates for filling data gaps;
- ✓ An interdisciplinary team of experts who can cooperate (geologists, hydrologists, agronomists, surveyors, etc).

Are there any specificities to be considered for regionalised RDPs?

Regional RDPs may not have the resources to support the application of such models, if they do not already exist. If this is the case, the evaluator should apply alternative methods, especially qualitative ones.





Are time/resources sufficient for establishing a model?

What can be done to improve the data situation?

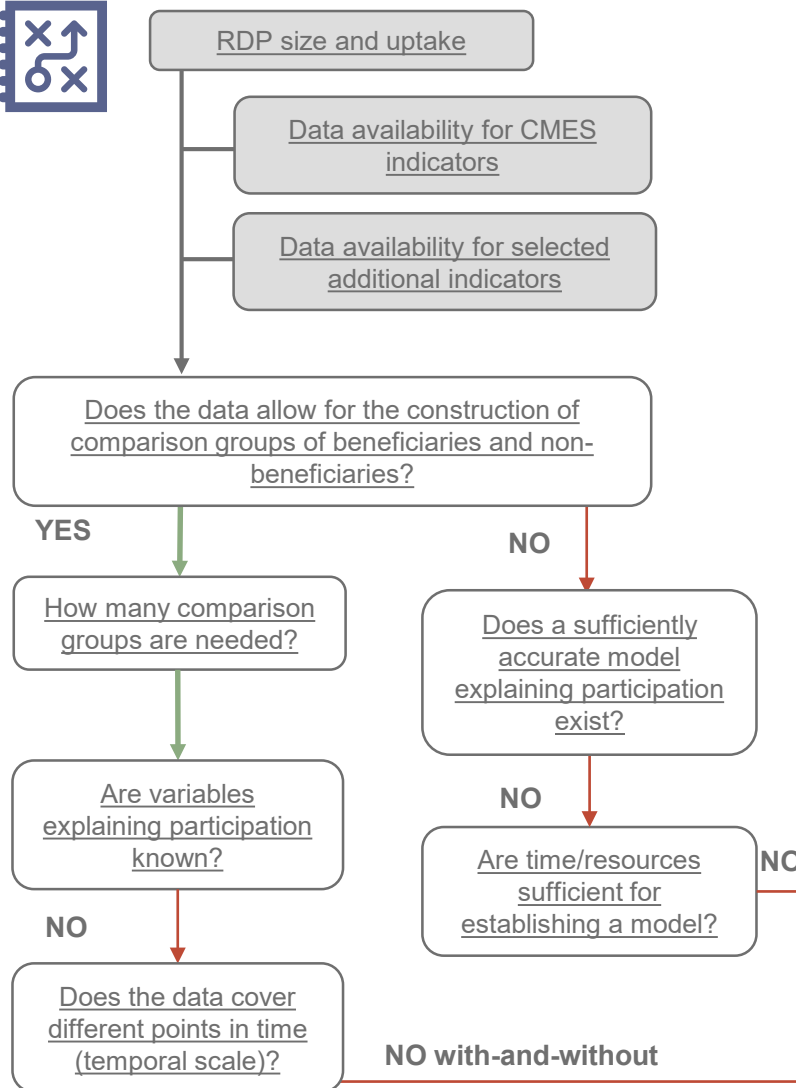
Short-term solutions (for AIR 2019)

If a model does not exist it is not possible to use the model for the assessment in 2019. If this is the case the evaluator should try to apply other approaches listed in the logic model figure.

Long-term solutions (for ex-post)

The Managing Authority can consider establishing a model, which can serve to improve the RDP evaluation and other agricultural policy related programmes, such as, the monitoring of the Nitrate Vulnerable Zones.





Naïve Group Comparisons, Qualitative Methods

At the micro-level, for qualitative assessments, agricultural holdings should be used as the unit of analysis and the MAPP method should be used to assess the RDP's net effects on both water-related impact indicators. The MAPP method should be applied using both beneficiaries and non-beneficiaries.

At the macro-level, the RDP's net effects are obtained by applying Naïve Group Comparisons. Values of indicators for beneficiaries are compared with the average value obtained for the NUTS 2 level or the RDP area.



Read more in guidelines *Assessing RDP achievements and impact in 2019*, PART II, Chapter 2.6.4 and PART IV, Chapter 4.4.3.



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