

# Evaluation of Decision Support Tools



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A comprehensive evaluation of selected European decision support tools (DSTs) has been conducted based on testing of appropriate DSTs across the FAIRWAY case study sites. The tested DSTs cover farm, catchment and regional scales and support nutrient or pesticide management, including risk assessment and identification of cost-effective mitigation measures. The overall purpose of the evaluation is to provide information and input data for subsequent development of a framework to highlight the ways in which DSTs can be applied successfully to establish and improve awareness of diffuse pollution of vulnerable drinking water resources among farmers and other stakeholders.

Following a survey and review process which identified 36 potential DSTs, a shortlist of twelve DSTs have been tested at nine FAIRWAY case study sites across the EU. The participating case study sites all face different challenges; therefore different DSTs were identified for testing. After selection of the DSTs for each case study site, bilateral contact with the owners of the DSTs was established to obtain support and access to the software. This was followed by a trial period, using local data for each site, and involving meetings with and demonstrations to stakeholders. During the process, barriers to exchange between countries were identified. Additionally, information about the farmers and stakeholders' needs in terms of functionality, use and access to DSTs, including their attitude toward DSTs, were collected. Being able to exchange and test this number of DSTs across EU is unique and has provided valuable information and insights.

Results of the evaluations indicate that exchange of DSTs between countries is challenging due to the various barriers to use e.g. different legislation, input data requirements and regional differences in precipitation, soil types etc. See Table 1 for further details. Therefore, most countries have comparable DSTs designed to address similar problems. During the trials all case studies found inspiration and ideas from other countries' DSTs which they would consider implementing in their own area. Thus, the conclusion was that the countries preferred to adopt ideas and either enhance existing or develop new region-specific DSTs, rather than to attempt to modify a DST developed for another country.

Based on the tests of DSTs, criteria relating to functionality, use, access and output were identified which a DST should fulfil if it is likely to be successful (Figure 1). However, it was emphasized by the test persons in the FAIRWAY case study sites that support and advice from well-educated and communicative skillful advisors are highly valuable for the end user to make the right decisions.



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Table 1. Identified barriers to the exchange of DSTs from one country to another.

Barriers	Note
Language	At the outset of the project, all countries, responding to an assessment of 36 potential test DSTs (see Table 5 in report D5.1, Nicholson <i>et al.</i> , 2018), identified language as a key barrier to transferring DSTs from one country to another. As reported in Task 5.1, often the DST and supporting information are only available in the local language (Nicholson <i>et al.</i> , 2018).
Lack of support / documentation	For some DSTs the case study test groups identified lack of support and supporting documentation as a barrier to exchange.
Specialist software or skills required	Some of the complex DSTs require specialised personnel to run them and interpret the results (e.g. the DST requires expertise in GIS).
Software access	Some DSTs are commercial products requiring passwords for login. If the DSTs are not owned by project partners, software access has been reported to be a barrier to exchange.
Financial cost	For several DSTs financial cost has been reported to be a barrier for exchange from one country to another.
Data requirements	There is a wide variation in the data requirements for the DSTs as they vary in sophistication. Thus, most case study sites reported that data requirements might be a barrier for transferring a DST from one country to another. For example, in Northern Ireland little farm data is publically available, in contrast to Denmark where a large amount of data is publically available. Since different classification systems are used in different countries, data conversion to the required format is often required. This is crucial since the quality of the input data determines the quality of the output.
Developed based on country specific legislation	Some DSTs are developed based on country specific legislation, which is a barrier to a direct exchange of the DSTs. However, part of the DST and/or the principles could be exchanged. For example, Mark Online (DK) was successfully tested in Lower Saxony and it was found that some elements could be integrated into the German system. However the different legislation and its implementation in Denmark and Germany must be respected and limits the direct exchange of a DST between these countries.
Differences between regions (e.g. climate) / farm types	Regional differences can present a barrier for exchange (e.g. the precipitation pattern in Britain and Northern Ireland is not the same) or farm types (e.g. farms in Slovenia are much smaller than farms in the Netherlands). Generally, it is difficult to exchange software if it is calibrated to national conditions.

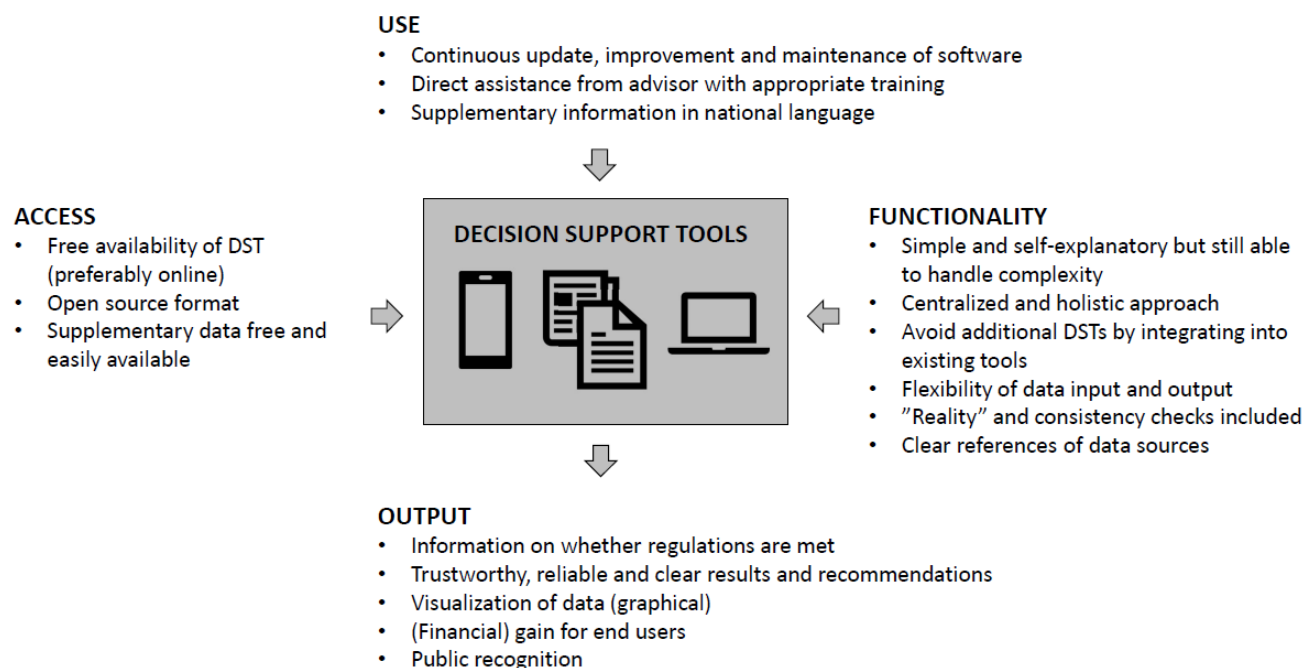


Figure 1. Criteria that DSTs should fulfil for successful uptake by end users.