

Output Factsheet

Output title: Methodology for drought impact assessment

Summary of the output (max. 2500 characters)

Output presents a common methodology for drought impact assessment and forecast. Methodology for drought impact assessment consists of national reporting networks (NRN) and system for data collecting and processing. NRN is based on engaged reporters using common standard protocol and multi-language online questionnaires. Automatic evaluation system each week carries out data processing and drought impact maps preparation. The system has been developed and programmed in collaboration with the partners. Reporters are mainly agricultural farmers, winegrowers and foresters. Questionnaires used by reporters are available at <https://questionnaire.intersucho.cz/en/> and divided into three scopes according to the field of reporter's interest (agriculture, fruit orchards and viticulture, forestry). Questionnaires contain 10–13 simple questions. The first three questions are the same for all three questionnaires and are based on the evaluation of soil moisture in the topsoil layer (actual soil moisture, soil moisture during the last 3 months and its noticeable change from the previous week). The evaluation of soil moisture in topsoil is based on a simple fingerprint assessment (the scale is moving from a dry and dusty soil without the possibility to make any form to fully saturated soil sticking to fingers). The scale for water balance during the last 3 months is ranging among seven different situations from very dry to very moist conditions. The remaining questions focus on the specific impact observed on key crops (or fruit trees and forest types) for which reporters evaluate drought-situation at their specific plot through estimation of expected possible yield decline (or observed yield decline after harvest) in comparison to the last-3-year-average yield reached.

Methodology for drought impact forecast consists on one hand of quantitative insights obtained from the relation between observed drought impacts by NRN and the drought indices (SPEI and SWI), and on the other hand of relationship between the statuses of vegetation predicted from the NDVI/EVI2 data and SWI dataset combined with the known response in the yield levels from the period during 2000-2017 which enables yield prediction per individually agricultural crop on NUTS3 regions.

Drought impact maps, prepared based on NRN data, and yield prediction maps, prepared as a seasonal yield outlook, are available in Drought User Service at <http://www.droughtwatch.eu/>. For both parts of the methodology, the manual has been prepared and finalized.

Contribution to the project and Programme objectives (max. 1500 characters)

Estimation of near-real-time drought impact assessment involves drought reporters, encourages stakeholders and brings the possibility of describing actual drought situation on their locality and directly contributes to:

Project objectives: specific objective no. 2 "Unification of monitoring tools and cross-border

coherence of near real - time impact assessments ”

DTP Priority Axis 2: Strengthen transnational water management and flood risk prevention and Improve preparedness for environmental risk management;

Transnational impact (max. 1500 characters)

The building of system of NRNs at international level creates a unique cross-border system of near-real-time drought observations with common methodology and level of detail. This reporting has started in the Czech Republic and through building up confidence and know-how were spread across the DriDanube countries. Efforts showed also regional differences needed to underpin bottom-up approaches. On the other hand, the ability to estimate drought impacts and yield anomalies using a common methodology centrally allows for independent verification of reported impacts and adds early warning capability to the system.

Contribution to EUSDR actions and/or targets (max. 1500 characters)

The main policy instrument in drought management remains the Water Framework Directive (WFD). Ability to in near real - time quantify drought impacts and moreover to estimate them ahead of time will hopefully help in organization and regulation of water management at the level of individual countries which can now rely also on independent information and forecast for the entire region. The output contributes to EUSDR PA5 (Environmental risks) especially by providing operational cooperation among countries and their authorities. National reporting network touches EUSDR PA5 Target 3 with comparable data/information about extreme events and involves reporters on mainly volunteer basis which strengthening general awareness.

Performed testing, if applicable (max. 1000 characters)

The methodology has been tested during 1st pilot action in the Czech Republic, Croatia, Montenegro and Romania during year 2018. The systems for drought impacts and yield anomalies have been tested for the entire period for which data have been available (2000-2018). The results of these test have been and are being processed in the form of an impact journal papers to allow independent verification through a peer-reviewed process.

Integration and use of the output by the target group (max. 2000 characters)

The target groups have been in most countries directly involved as both the users and providers of the drought impact information. The farmers/farmers' group benefit from drought forecasts as this is providing them with important information which is relevant for their operations and strategies within the season. At the same time, near-real-time information on impacts and expected impacts for the whole Danube region has been during 2018 shown to be also highly relevant for farmers e.g. for selection of appropriate price negotiation strategy or building fodder stocks etc. The key state agencies responsible for drought event management and response are included in the project and e.g. in Czech Republic are directly using the reporting network to assess drought damage.

Geographical coverage and transferability (max. 1500 characters)

Reporting on drought impacts through national reporting networks currently runs weekly in all 10 DriDanube countries. Involving other countries into the system is possible. System for data collection does not have any limitations in terms of geographical coverage. On the other hand, process of building up national reporting network is lengthier task and requires appropriate motivation both from national authorities to potential participants. It may thus be challenging, depending on the country.

Durability (max. 1500 characters)

The system of NRN was built mainly on a volunteer basis but with the goal of long-term sustainability. With partners' great efforts and motivation put in, the networks keep growing and are expected to continue in all 10 DriDanube countries. The component of the system based on the impact estimates at the NUTS2 and NUTS3 level have been developed and are being automated to allow low-cost operation mode even after the termination of the project funding.

Synergies with other projects/ initiatives and/or alignment with current EU policies/ directives/ regulations, if applicable (max. 1500 characters)

The project has built on the expertise gained during the Czech national project "InterDrought" but especially through support from the DMCSEE. It has been shown to complement existing drought monitoring tools at the national level and is being currently also implemented as a layer into the European Drought Observatory system.

Output integration in the current political/ economic/ social/ technological/ environmental/ legal/ regulatory framework (max. 2000 characters)

Existing legal frameworks are addressing the challenge of water scarcity and droughts (Water Framework Directive, EU 2007 Communication, Civil Protection Mechanism, etc.) is being implemented into the legislation. The existence of the methodology and also DUS products is the first prerequisite of their integration into this legal Framework. It is first monitoring and early warning system providing early warning both at national and regional scales through comparable methodologies and is being made part of political debate. Early impact warning methodology in case of crop yields have been utilized in the Czech 2018 drought response.