

# The TRUST Tool for Water Risk Management

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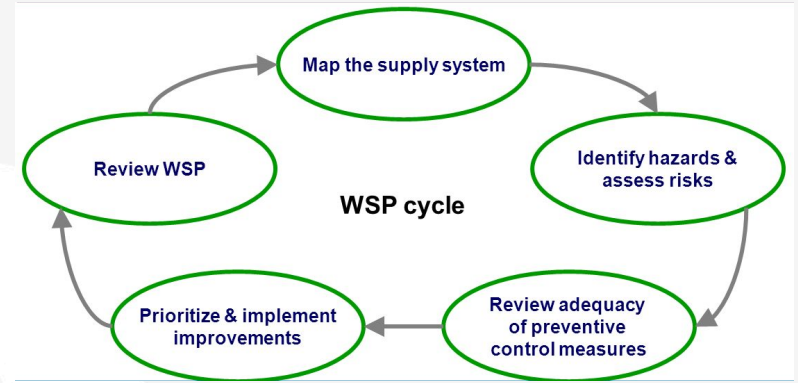
GRoW Final Conference - Stakeholder Forum C:  
Decision support systems to prevent water conflicts



# The WHO Water Safety Plan (WSP) Approach

## A water safety plan

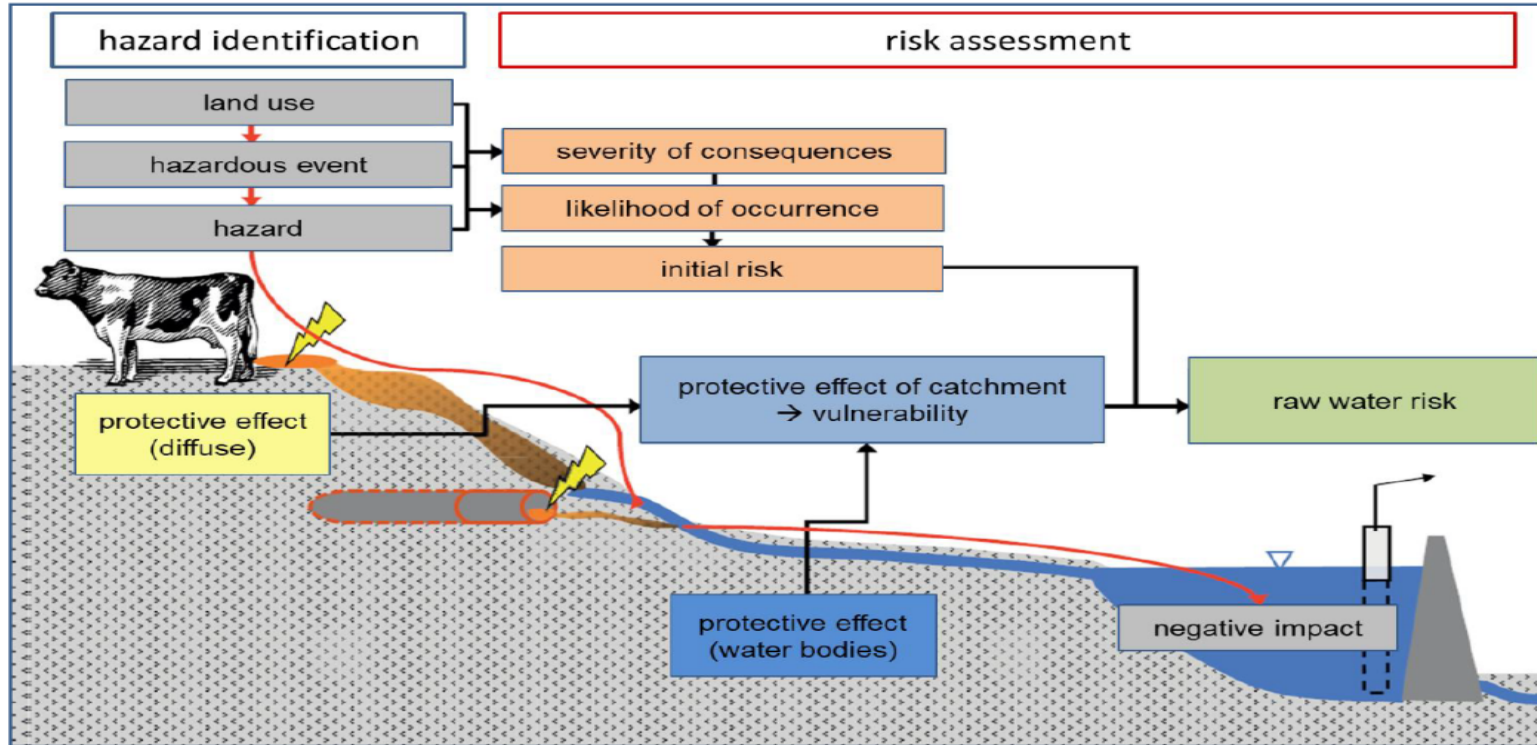
- is a plan to ensure the safety of **drinking water**
- through the use of a comprehensive **risk assessment** and **risk management** approach
- that encompasses **all steps in water supply** from catchment to consumer.



The WSP approach has been defined by the World Health Organisation (WHO) in their Guidelines for Drinking-water Quality (GDWQ).

Closely related to existing and upcoming European and German **norms, regulations, guidelines**, and best practice recommendations – like the European standard EN 15975-2 "Security of drinking water supply - Guidelines for risk and crisis management - Part 2: Risk management".

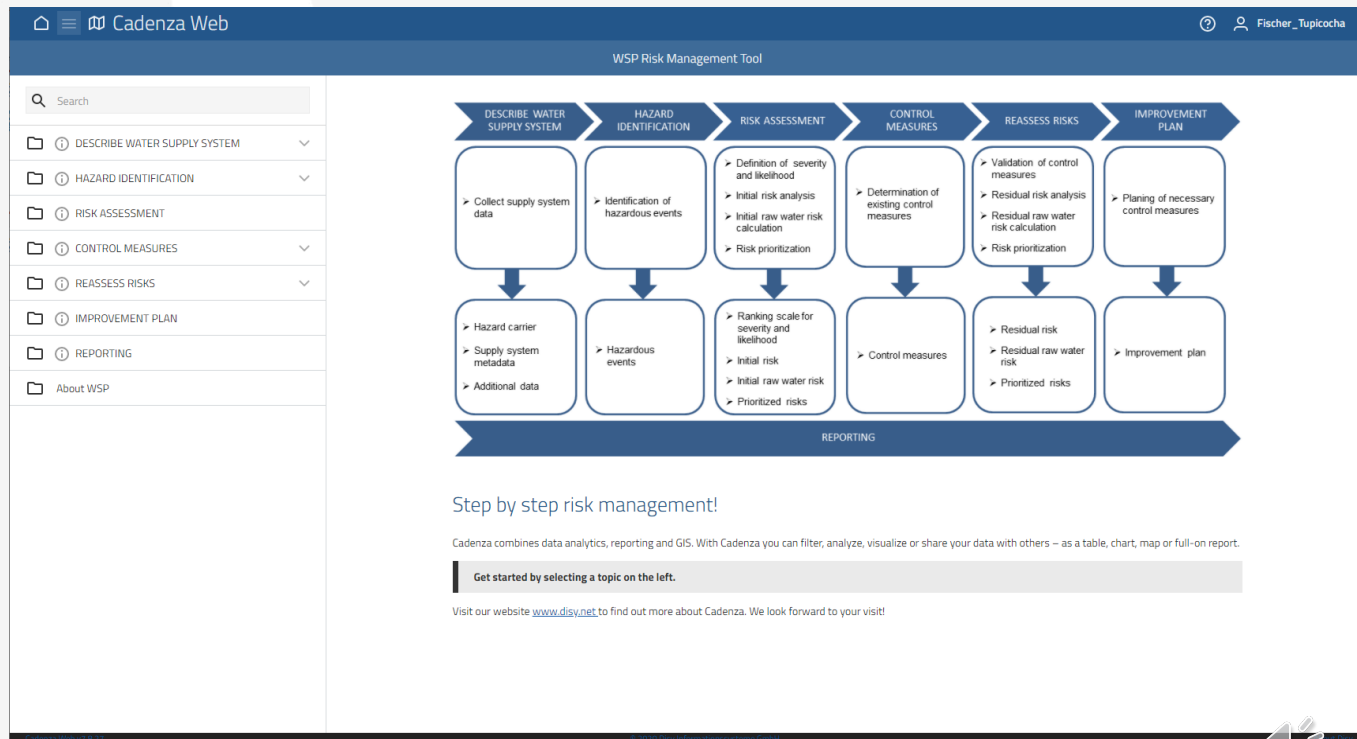
# Risk Assessment at the Core of the WSP Approach



The tool aims at ...

... input masks,  
database persistency,  
map-based interaction,  
automated reporting

... for the full WSP cycle



Cadenza Web

WSP Risk Management Tool

SEARCH

- DESCRIBE WATER SUPPLY SYSTEM
- HAZARD IDENTIFICATION
- RISK ASSESSMENT
- CONTROL MEASURES
- REASSESS RISKS
- IMPROVEMENT PLAN
- REPORTING
- About WSP

DESCRIBE WATER SUPPLY SYSTEM

- Collect supply system data

HAZARD IDENTIFICATION

- Identification of hazardous events

RISK ASSESSMENT

- Definition of severity and likelihood
- Initial risk analysis
- Initial raw water risk calculation
- Risk prioritization

CONTROL MEASURES

- Determination of existing control measures

REASSESS RISKS

- Validation of control measures
- Residual risk analysis
- Residual raw water risk calculation
- Risk prioritization

IMPROVEMENT PLAN

- Planning of necessary control measures

REPORTING

- Hazard carrier
- Supply system metadata
- Additional data
- Hazardous events
- Ranking scale for severity and likelihood
- Initial risk
- Initial raw water risk
- Prioritized risks
- Control measures
- Residual risk
- Residual raw water risk
- Prioritized risks
- Improvement plan

Step by step risk management!

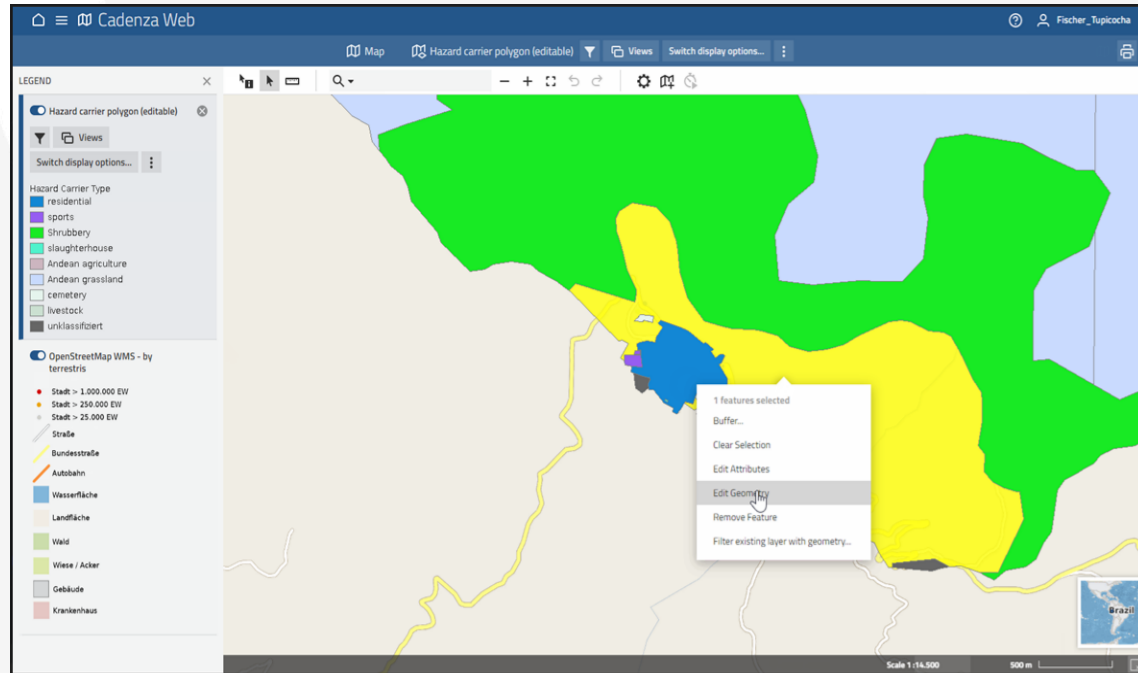
Cadenza combines data analytics, reporting and GIS. With Cadenza you can filter, analyze, visualize or share your data with others – as a table, chart, map or full-on report.

Get started by selecting a topic on the left.

Visit our website [www.disy.net](http://www.disy.net) to find out more about Cadenza. We look forward to your visit!

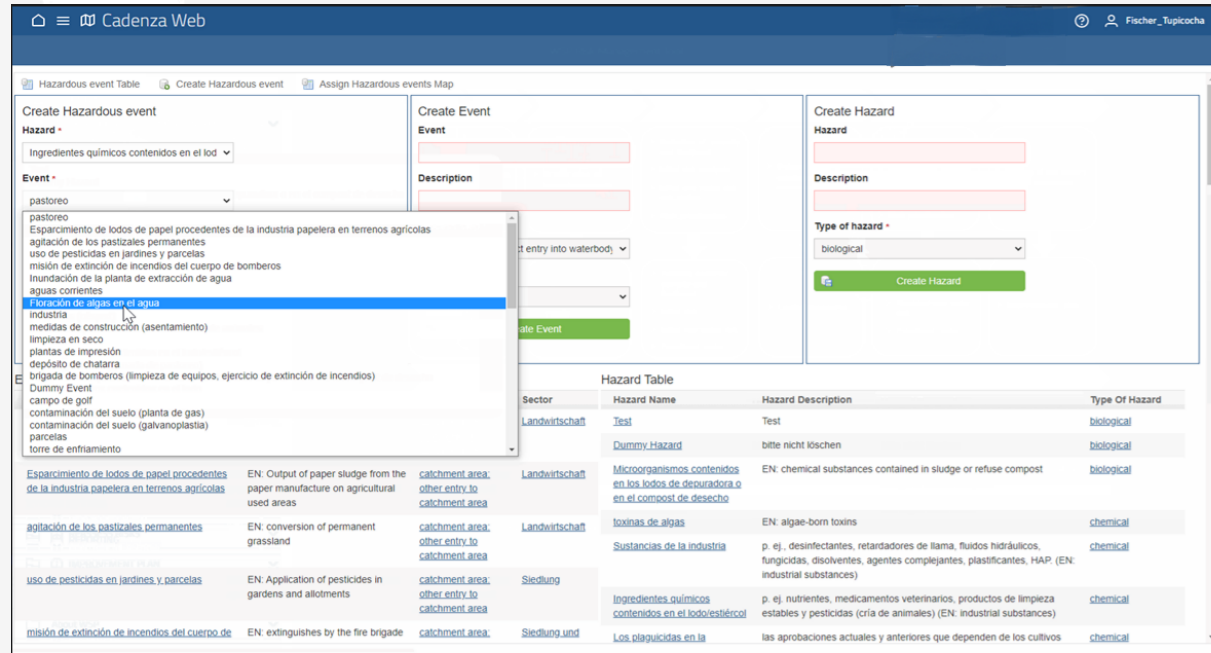
# Land-Use Map as the Starting Point for Risk Assessment

Geographic Information System (GIS) allows to edit geometries to be used as hazard carriers



Pulldown menus offer typical kinds of hazards

Hazardous events are attached to hazard carriers (geometries) in the GIS maps



The screenshot shows the 'Cadenza Web' interface with three main panels for creating hazardous events:

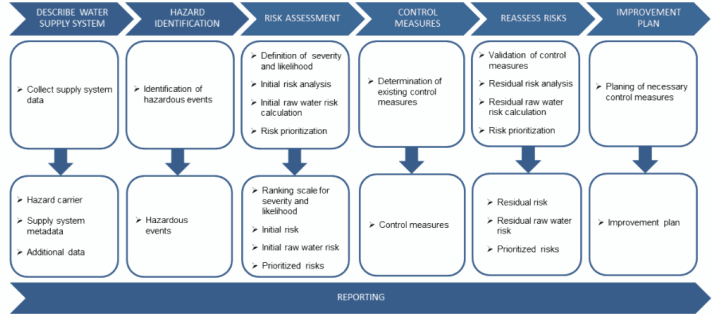
- Create Hazardous event:** Includes a 'Hazard' dropdown menu (currently showing 'Ingredientes químicos contenidos en el lod') and an 'Event' dropdown menu (currently showing 'pastoreo').
- Create Event:** Includes an 'Event' text field, a 'Description' text field, and a 'Type of hazard' dropdown menu (currently showing 'biological').
- Create Hazard:** Includes a 'Hazard' text field, a 'Description' text field, and a 'Create Hazard' button.

A central 'Hazard Table' displays a list of hazards with columns for Sector, Hazard Name, Hazard Description, and Type Of Hazard. The table includes entries such as 'Test', 'Dummy Hazard', 'Microorganismos contenidos en los lodos de depuradora o en el compost de desecho', 'toxinas de algas', 'Sustancias de la industria', 'Ingredientes químicos contenidos en el lodo/estiercol', and 'Los plaguicidas en la'.

Vulnerability of groundwater resources is characterized as a GIS layer

Cadenza Web
Fischer\_Tupicocha

WSP Risk Management Tool



The flowchart illustrates a six-step process for WSP Risk Management: 1. DESCRIBE WATER SUPPLY SYSTEM (Collect supply system data), 2. HAZARD IDENTIFICATION (Identification of hazardous events), 3. RISK ASSESSMENT (Definition of severity and likelihood, Initial risk analysis, Initial raw water risk calculation, Risk prioritization), 4. CONTROL MEASURES (Determination of existing control measures), 5. REASSESS RISKS (Validation of control measures, Residual raw water risk calculation, Risk prioritization), 6. IMPROVEMENT PLAN (Validation of control measures, Residual raw water risk calculation, Risk prioritization). A final REPORTING step is shown at the bottom.

Step by step risk management!

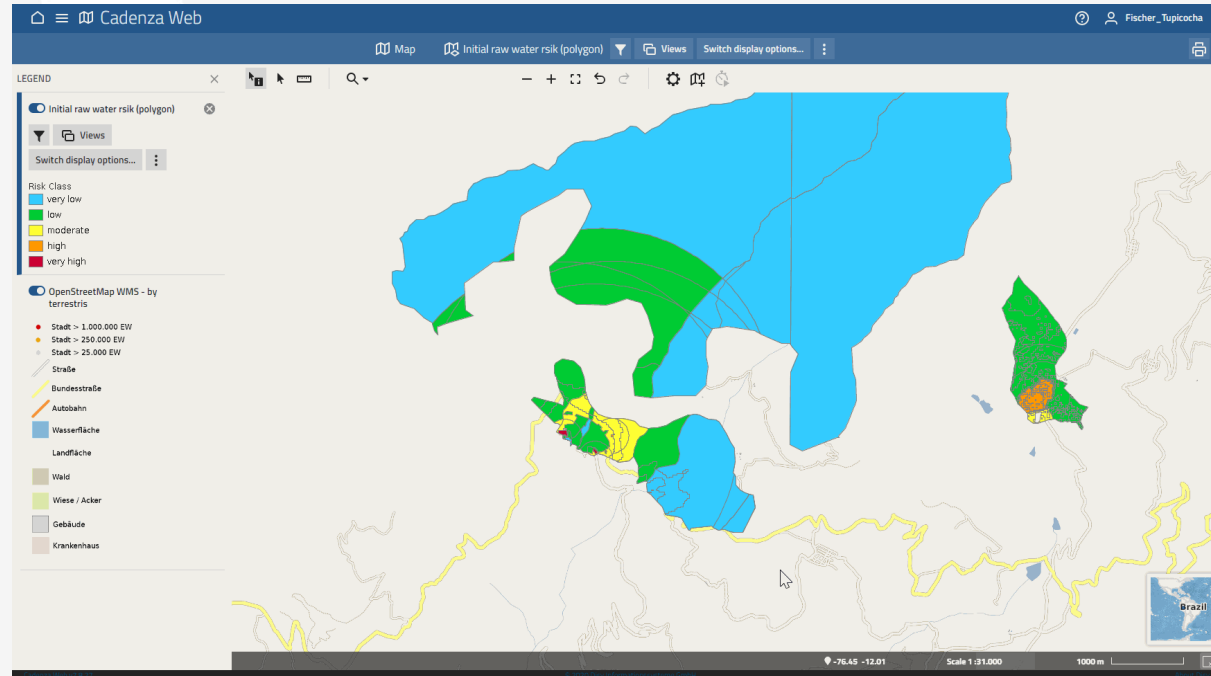
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Intersection of accumulated risk with vulnerability leads to initial raw water risk





TRUST prototype covers significant parts of the WSP risk assessment step for a catchment area.

GIS, basic database support and reporting as the basis for sustained risk management and comfortable user functionalities.

Pilot implementations in TRUST test regions in Peru and in Germany.

Further development (coverage of full WSP cycle, further usability improvements, intelligent assistance functions) planned for future projects.

Have a look at our virtual exhibition booth!

<http://trust-grow.de/>

- (Gottwalt, 2017): Jonas Gottwalt: Designing a web-based application for process-oriented risk management of drinking-water catchments according to the Water Safety Plan approach. Master thesis, Hochschule für Technik und Wirtschaft Dresden, Fakultät Geoinformation, Dezember 2017.
- (Rickert et al., 2016) B. Rickert, I. Chorus, O. Schmoll: Protecting surface water for health - Identifying, assessing and managing drinking-water quality risks in surface-water catchments. Geneva: World Health Organization, 2016.
- (Schmoll et al., 2014) Oliver Schmoll, Dettlef Bethmann, Sebastian Sturm, Bastian Schnabel: Das Water-Safety-Plan-Konzept: Ein Handbuch für kleine Wasserversorgungen. Dessau-Roßlau: Umweltbundesamt, 2014.
- (Sturm & Kiefer, 2010) Sebastian Sturm, Joachim Kiefer: Risikomanagement im Ressourcenschutz. In: energie|wasser-praxis, DVGW, Nr. 6/2010.
- (Sturm et al., 2016) S. Sturm, F. Villinger, J. Kiefer, J.: Neuer Ansatz zum Risikomanagement für Talsperren-Einzugsgebiete - Teil 1. In: energie|wasser-praxis, DVGW, Nr. 5/2016.
- (WHO, 2011) World Health Organization (ed.): Guidelines for Drinking-Water Quality (4<sup>th</sup> ed). Geneva: World Health Organization, 2011.