INTERREG IIIB CADSES

STRiM

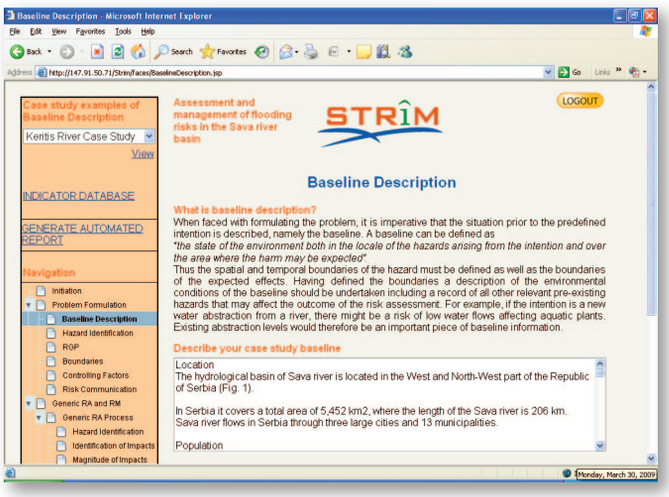
Remotely Accessed Decision Support System for Transnational Environmental Risk Management

Awareness of the need to face the risks and challenges for balanced and sustainable development in Europe posed by natural and technological hazards in Europe is increasing. There are several elements in EU legislation, policies and programmes encouraging the introduction of risk management into planning and decision making, (underpinned by the precautionary principle) yet this inclusion is far from complete and proving problematic. Currently, hazards are being addressed in heterogeneous, fragmented and partial ways and at different levels by existing community instruments. In addition key measures, such as the Directives on Environmental Impact Assessment (EIA), on Strategic Environmental Assessment (SEA) including the Water Framework Directive (WFD) point out the need for the inclusion of risk assessment and management as well as the consideration of transboundary impacts, yet the process of doing this is not specified, subsequently limiting its implementation.

The STRiM project (Remotely Accessed Decision Support System for Transnational Environmental Risk Management) aims to address these issues by developing a planning relevant framework and addressing environmental risk holistically, focusing on transboundary risks. Transboundary risks are defined as "risks that are generated under one regulatory jurisdiction and have significant actual or anticipated impacts in another, regionnaly or globally, are a source of concern for regulators, politicians and public" The challenge is great considering the acknowledged difficulties of transboundary or cross border assessment in general such as technical limitations e.g. data incompatibility, social and political limitations such as soveregneity differing languages, cultures, levels of economic growth varying legal and regulatory structures political systems etc.

Increasing literature attributes the lack of practical implementation of risk management procedures to the lack of science policy integration within existing decision making processes and the policy/ decision maker and scientist conflict.

It is argued that policy makers and implementing authorities are in need of Decision Support Systems (DSS) in the field of environmental management which can enable science knowledge transfer simultaneously paying greater attention to potential user needs and to the identification of concrete application contexts. Therefore STRiM, as an INTERREG IIIB CADSES project whose primary aim is the building of bridges between scientific research and the praxis of planners and multiple other stakeholders has focused on the development of a common framework and DSS to enable the integration and implementation of transboundary environmental risk management.

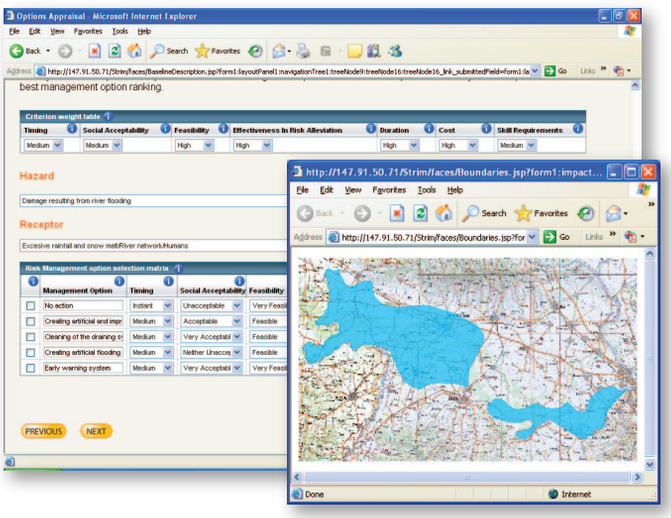


STRiM DSS

The STRiM DSS was designed to adhere to the following specifications, which in turn influenced its nature. The specifications were based on a review of users needs as well as a literature review regarding risk assessment and management frameworks as well as DSS:

- User focused (simple, cost and time efficient)
- Participatory (enabling multi-stakeholder collaboration and risk communication)
- Generic (applicable to any environmental risk)
- Transboundary (provides the opportunity for the assessment and management of risks regardless of administrative, geographical and political boundaries)
- Multiscale (applicable for different scales of assessment)

The application context of the STRiM framework and DSS is defined in terms of a decision that should be made, which could affect the environment and as a result its target users are competent authorities involved in the decision making. From the above the generic nature and wide scope of this framework and DSS is ascertained; indicatively it can be used to inform a decision regarding whether to give planning permission to a small scale olive mill processing unit and similarly to a decision regarding the diversion of a transnational river. The target audience is wide however, it is targeted at practitioners, technicians and decision makers, not the scientific community. Typical applications foresee the involvement of a team of decision makers and technicians, including interested stakeholders (which can represent the perspectives of different countries and interests) using the remotely accessed STRiM DSS to arrive at an informed decision regarding the best risk management option to address a given environmental risk. In order to achieve the above, users are guided step by step and provided with tools and guidelines in carrying out the STRiM risk assessment and management framework.



STRiM DSS is implemented as a Web-based application and is accessible to its users which can create risk assessment and management case studies by carrying out the following five steps, on an anytime-anywhere basis:

- Step 1. Initiation consists of the starting point of any RA or RM, which entails the consideration of the need to conduct the assessment.
- Step 2. Problem Formulation is composed of four components: baseline description, potential risk identification and components description, identi fication of risk generating processes and definition of boundaries and controlling factors.
- Step 3. Generic (Qualitative) Risk Assessment and Management Process includes qualitative risk assessment of selected hazards and options appraisal of applicable management options.
- Step 4. Risk Management evaluates anddiscusses the preferred risk management options and monitoring strategy.
- Step 5. Risk Communication describes the followed risk communication procedure.

STRiM DSS facilitates an automatic Qualitative Risk Assessment based on the user's estimation of risk specific magnitude of impacts and three probabilities contributing to risk: probability of hazard occurring, probability of receptor being exposed and probability of harm occurring. It also supports Options Appraisal of different risk management options and enables the selection of the best option using Multi-Criteria Analysis (MCA) according to the stakeholders' preferences. The Risk Assessment and Management (RA&M) DSS serves as an integration platform for the other components of STRiM DSS: DSS map server (IMS), DSS indicator database and DSS document database.

The tangible outputs of the DSS application consist of automated reports which describe the results of each step of the process including a list of risks requiring further detailed study as well as a prioritised list of risk management options. Within the report a description of any participation or risk communication activities is also disclosed. All guidance documents, indicators as well as pilot reports are available to users for download and printing.

The preliminary evaluation of the framework and DSS against the original specifications is positive indicating that the STRiM RA & M DSS is in fact a one stop shop to transboundary RA & M in the CADSES region. The pilots illustrated that for the generic assessment a user, without undergoing recommended consultation exercises can effectively carry out and have the automated report within a few hours! In addition, any assessment can be revisited and different risk management options evaluated, illustrating the dynamic nature of this tool. The flexible qualitative nature of the framework which allows the user to select data sets when estimating risk significance overcomes a commonly acknowledged issue of transboundary assessments in general, that of data incompatibility and unavailability. The applicability of this application at different scales was also concluded as feasible, as the DSS structured yet flexible approach to problem formulation enables the assessments to be undertaken at any scale.

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Technical information

STRiM DSS is implemented as a Web application using 3-tier architecture and AJAX, Java Server Faces and Enterprise Beans technologies.

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