



**HAL**  
open science

## A multicriteria assessment method to compare scenarios of water management in agricultural landscapes

Sandrine Allain, Gaël Plumecocq, Delphine Burger-Leenhardt

### ► To cite this version:

Sandrine Allain, Gaël Plumecocq, Delphine Burger-Leenhardt. A multicriteria assessment method to compare scenarios of water management in agricultural landscapes. 8. International Congress on Environmental Modelling and Software, Jul 2016, Toulouse, France. International Environmental Modelling and Software Society (iEMSs), 2016, The 8th International Congress on Environmental Modelling and Software met in Toulouse, France, on July 10-14, 2016. hal-01602199

**HAL Id: hal-01602199**

**<https://hal.science/hal-01602199>**

Submitted on 2 Jun 2020

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Jul 11th, 11:30 AM - 11:50 AM

# A multicriteria assessment method to compare scenarios of water management in agricultural landscapes

Sandrine Allain

*National Polytechnic Institute of Toulouse, sandrine.allain@toulouse.inra.fr*

Gaël Plumecocq

*National Polytechnic Institute of Toulouse, gael.plumecocq@toulouse.inra.fr*

Delphine Leenhardt

*National Polytechnic Institute of Toulouse, delphine.burger-leenhardt@toulouse.inra.fr*

Follow this and additional works at: <http://scholarsarchive.byu.edu/iemssconference>

 Part of the [Civil Engineering Commons](#), [Data Storage Systems Commons](#), [Environmental Engineering Commons](#), [Hydraulic Engineering Commons](#), and the [Other Civil and Environmental Engineering Commons](#)

---

Sandrine Allain, Gaël Plumecocq, and Delphine Leenhardt, "A multicriteria assessment method to compare scenarios of water management in agricultural landscapes" (July 11, 2016). *International Congress on Environmental Modelling and Software*. Paper 23. <http://scholarsarchive.byu.edu/iemssconference/2016/Stream-D/23>

This Event is brought to you for free and open access by the Civil and Environmental Engineering at BYU ScholarsArchive. It has been accepted for inclusion in International Congress on Environmental Modelling and Software by an authorized administrator of BYU ScholarsArchive. For more information, please contact [scholarsarchive@byu.edu](mailto:scholarsarchive@byu.edu).

# A multicriteria assessment method to compare scenarios of water management in agricultural landscapes

**Sandrine Allain\***, **Gaël Plumecocq\***, **Delphine Leenhardt\***

*UMR 1248 AGIR, National Institute for Agronomic Research / National Polytechnic Institute of Toulouse, Castanet-Tolosan, France*

*Email addresses : [sandrine.allain@toulouse.inra.fr](mailto:sandrine.allain@toulouse.inra.fr); [gael.plumecocq@toulouse.inra.fr](mailto:gael.plumecocq@toulouse.inra.fr); [delphine.burger-leenhardt@toulouse.inra.fr](mailto:delphine.burger-leenhardt@toulouse.inra.fr)*

**Abstract:** In the Aveyron watershed (South-Western France), where the agricultural economy mainly relies on irrigated productions (maize and fruits), engaging changes in quantitative water management is socially challenging. The watershed suffers from a structural misbalance between the water demand and the water offer, and recurring crises in the low-flow period lead to emergency restrictions of use. This situation tenses competing stakeholder positions and erodes the social-ecological system's resilience. Characterizing and valuing options for change can support decision-making. Nonetheless, the various expert assessments that flourished as answers to political incentives for a better management of watershed did not succeed in bringing out socially-accepted solutions. We hypothesize that expert judgments (alone) cannot frame problems that also arise from colliding values and interests. Hence we built a spatialized multi-actor multi-criteria assessment method in order to map out matches and mismatches between the people involved and between the stakes relevant to them. This method proceeds through various steps: 1) Problem structuring: relevant stakeholders are identified; criteria and scenarios are defined following a bottom-up approach; 2) Definition and evaluation of a set of indicators for each scenario, using mainly model simulations of water management; 3) Mapping out stakeholder judgments; 4) Collective deliberation over the socially-relevant option(s) for change. A specificity of the method lies in the way stakeholder judgments are elicited and represented (step 3). Indicators constitute arguments that stakeholders can combine to express their judgments. Stakeholders map out where one scenario is acceptable to them and where it is not (spatialized judgments). In addition, they can define places of special importance for each criterion (spatialized weights). Integrating those maps would help change the focus from "which scenario is the best" to "where does a scenario bring out conflicts and where is it consensual option". We expect such a transformation to favour social learning and the design of new technical and organizational solutions for watershed management.

**Keywords:** Quantitative water management; Irrigated agriculture; Spatial multi-criteria assessment; Collective deliberation