

## The Baixo Guadiana Participatory Modeling Process

Stage	When?	What?	Who?	How? (How long?)	What happened?
	[Month # 1] October 2003	Preparatory meeting with National Water Institute (INAG)	Modeling team and INAG staff	Group discussion (2 hours)	The modeling team introduced to the INAG team (national water authority) the generic project goals (development of a scoping model to support the implementation of the Water Framework Directive - WFD in the Portuguese Pilot River Basin of the Guadiana river). The principles and advantages of the participatory modeling approach were discussed. INAG supplied information about the WFD Common Implementation Strategy and the EU terms of reference for testing the WFD guidance documents.
	October 2003	Project webpage	Modeling team		Linked to the ADVISOR project webpage, available at: <a href="http://ecomana.dcea.fct.unl.pt/projects/advisor">http://ecomana.dcea.fct.unl.pt/projects/advisor</a>
	[Month # 2] 20 November 2003	First preparatory meeting with natural reserve staff	Natural reserve staff and modeling team	Group discussion (5 hours) Use of "DPSIR" indicator framework for problems' description	The lower part of the Guadiana river basin was selected for the development of the project. The Natural Reserve of the Castro Marim and Vila Real de St.º António Saltmarsh agreed to host the sessions and constituted the local pivotal institution. In this meeting, the modeling team explained the generic project goals and the discussion allowed for framing the local water and nature conservation issues. Problems were described using the "Driving Forces - Pressures - State - Impact - Response (DPSIR)" framework proposed by the European Environment Agency.
	[Month # 4] January 2004	Stakeholder analysis and participant invitation	Natural reserve staff and modeling team	Group discussion, press and literature review, cross-referencing	A preliminary list of possible stakeholders to be invited was drafted at the second preparatory meeting at the natural reserve on January 8. Subsequently, two more meetings took place to iterate this list. Starting from the identified water and nature conservation related issues in the Baixo Guadiana, possible institutions and actors with a stake in each issue were identified. This analysis was complemented with review of literature and local press. Invitations were sent out together with a flyer describing the project to all actors from the stakeholder list (86 stakeholders). Cross-referencing was also possible, since invited stakeholders had the possibility to suggest other participants.
	[Month # 4] January 2004	Quality assurance by extended peer review	2 ADVISOR project partners	Protocol for quality assurance	The modeling team met with Corral Quintana and Guimarães Pereira (ADVISOR partners from University of La Laguna, Spain and EC-JRC at Ispra) for framing the issues to be addressed in the participatory modeling experience. Subsequently, the ADVISOR partners prepared a specific protocol for quality assurance of the information and methods deployed which was applied by the modeling team throughout the process. The protocol was divided into six sections: I - Framing the project, II - social engagement, III - modeling team's experience, IV - research procedures undertaken, V - background information and VI - Communication of information.
	From 27 January to 11 February 2004	Preliminary interviews with participants	Modeling team interviewed 32 actors	Semi-structured interviews with questionnaire - open and closed questions. (32 hours: 1 hour average per interview)	Questionnaire was organized in the following sections: I - group composition, II - experience in participatory modeling, III - importance of public participation, IV - perceived consensus, V - problem identification (causes, impacts, responses) and characterization (trend, scale, impact), VI - desired development opportunities
	[Month # 5] 11, 12 February 2004	Treatment of preliminary questionnaires and preparing first workshop	Modeling team	Responses to closed questions were averaged. The problems (and associated causes, impacts and responses) identified by the interviewees were listed in a DPSIR matrix. The scripts for problem definition and causal loop diagramming were based on this matrix. Preparing room layout, materials (folders with paper, pen, general project information, interviews preliminary results).	The DPSIR matrix depicting the list of problems identified by interviewees was included in workbook 1 to be distributed at the first workshop. Preliminary results from the interviews were used to provide initial feedback to participants and to frame the plenary discussion in the first workshop, facilitating also the development of the integrated causal loop diagram (shared view on river basin problems). Furthermore, these results provided a blueprint for guiding the opportunities to be addressed by the simulation model at the policy analysis stage.

Problem definition and conceptualization I	13 February 2004	Workshop # 1	57 participants	Facilitated plenary discussions about: project objectives, modeling methodology (system dynamics principles), results from preliminary interviews, problem definition (park management objectives). (5 hours)	All sessions took place at the natural reserve auditorium. The workshop started with the presentation of the project objectives and framing of the issues within the policy context of the Water Framework Directive. Development of the causal loop diagram with the group was mediated by the facilitator from the modeling team, who used self-stick hexagons for representing the model variables proposed by participants. The interrelationships between variables were drawn on self-stick flip charts. When a sector was complete, the modeling team assembled the individual parts on a larger wall, identifying interactions between different sectors to form a holistic view of the current problems of the Baixo Guadiana. When addressing each sector, the facilitator asked for the selection of a "problem-variable", placed at the center of the diagram. In the second step, the possible causes of the problem were identified as well as the polarity of the causal relationship between them. The third step consisted of identifying the consequences of problems. Finally, loops were completed when possible solutions linked consequences (impacts) with the causes (pressures).
Behind the scenes	13 February to 29 March 2004	Preparing conceptualization tasks	Modeling team	Conceptualization scripts, workbook 2, room layout, materials (computer, data show, printer, white board, flipcharts, pens, hexagons for causal loop diagramming, paper)	Workbook 2 included a detailed explanation of causal loop diagram developed in the previous workshop and an explanation of SD building blocks for quantitative modelling.
Conceptualization II	29 March 2004	Workshop # 2	Participants per session: SGS1: 10 SGS2: 20	Model conceptualization (8 hours: 4 hours x 2 small group sessions)	Workbook 2 was distributed to participants. The building blocks of system dynamic models were presented. Simple "bathtub dynamics" model and behaviour explained. All participants agreed to start conceptualisation using the conceptual model. Model structure built in Powersim was projected onto the screen. Open questions, stories, divergent issues, causal mapping, data issues, spatial issues and reference modes were recorded in the flipcharts by the facilitator. The time horizon was defined by the group: 1970-2015. Data sources for the identified variables were listed.
Behind the scenes - specification and validation	From 29 March to 1 June 2004	Specification, validation and preparing scenario analysis	Modeling team with consultation of participants	Analysis of preliminary results (formal model, workshop records and flipcharts). Scenario analysis scripts, workbook 3, updating worksheet for model documentation, room layout, materials (same as above)	Modeling team developed the formal model. Some participants which have offered relevant information were consulted to help in the specification of the model.
Scenario analysis	[Month # 9] 2 June 2004	Workshop # 3	20 participants	Scenario analysis (4 hours)	Workbook 3 was distributed to participants. The facilitator presented the project deliverables (model, report, database). Then, the model structure was analyzed close to the simulated reference behavior, followed by discussion with the group. Finally, several scenarios were run and consequences compared. Broad conclusions on the model usefulness were reached. Follow-up activities discussed. Pre-stamped questionnaires delivered to participants at the end of the third workshop.

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June 2004 -

Final evaluation questionnaires, dissemination activities

13 questionnaires returned

Treatment of returned questionnaires. Preparation of reports, results included in the ADVISOR guidelines for public participation sent to EC DG Research, presentation in conferences, website

Questionnaire was organized in the following sections: I - group composition, II - group communication and interaction, III - consensus, IV - participatory process, V - learning, VI - deliverables, VII - information, VIII - commitment towards results  
The final report synthesized the process and results and presented guidance for developing the management plan for the park. All deliverables are available through the project's website.

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