

# Learning to manage quality in a multiple reservoir system: Contribution of a companion modelling approach

Raphaèle Ducrot<sup>1,2,3\*</sup>, Lucie Clavel<sup>4</sup> and Pierre Bommel<sup>5,6</sup>

<sup>1</sup> CIRAD, UMR G-eau, Fortaleza, Brazil

<sup>2</sup> CIRAD, UMR G-eau, Montpellier, F-34398 France

<sup>3</sup> FUNCEME, Av Rui Barbosa, 1246, Aldeota, CEP 60115-221 Fortaleza-CE, Brazil

<sup>4</sup> INRA; UMR AGIR; 31320 CASTANET TOLOSAN, France

<sup>5</sup> CIRAD, Faculdade de Tecnologia, Universidade de Brasília, Brasil

<sup>6</sup> CIRAD, UR Green, Montpellier, F-34398 France

## Abstract

The development of water policies based on integrated water management principles promotes the development of multi-stakeholder platforms to manage water resources at catchment level. This is the case of the Alto-Tietê watershed, the urban catchment encompassing the São Paulo metropolis in Brazil. The dynamic pattern of peri-urban areas characterised by rapid major changes has led to complex management issues in which the quantity and quality dimensions of water are intertwined. Effective participation of a broad spectrum of stakeholders supposes that actors from different technical backgrounds have a better understanding of the social and biophysical interactions of the system concerned. This paper describes the role of participatory modelling and simulation as a way to provide a meaningful framework to enable actors to understand the interdependencies in peri-urban catchment management. A role-playing game, connecting the quantitative and qualitative dynamics of the resources with social interactions at catchment level, was developed and tested with members of the catchment committee. Monitoring of the sessions underlined the role of such a tool in learning about collective water management.

**Keywords:** peri-urban catchment, eutrophication, companion modelling, participatory modelling, water allocation