Environmental Engineering and Management Journal *April 2014, Vol.13, No. 4, 1027-1038*
http://omicron.ch.tuiasi.ro/EEMJ/

"Gheorghe Asachi" Technical University of Iasi, Romania

SURVEY ON INTEGRATED MODELLING APPLIED IN ENVIRONMENTAL ENGINEERING AND MANAGEMENT

Ion Viorel Matei*, Laura Ungureanu

Spiru Haret University, Faculty of Financial Accounting Management, 4 Brazda lui Novac Street, Craiova, Romania

Abstract

In the context of the complexity of the environmental system, this paper addresses the problem of environmental modeling, considering the global aspects of sustainability as well as the linkage between environmental and economic issues. The survey on integrated modeling highlights that the complexity of the environmental problems should be approached on the basis of multi-disciplinary cooperation and studies. Furthermore, the European environmental standards and products quality standards impose to various actors and stakeholders rethinking their policies, as well as upgrading their production technologies to offer a number of competitive advantages, especially in foreign markets. Therefore, the present work analyses the integrated modeling of economic and environmental problems associated with difficulties of a long transition to a sustainable, smart and inclusive economy, which should contribute decisively to the development of new decision-making approaches and supports necessary for decision and policy making. The environmental modeling context is addressed by considering the system under study as a whole, including organically the interaction between constituent parts when quantitative processing is applied, just as it actually corresponds to actual behaviour. Also, integrated environmental modeling is discussed in the largest context of environmental and economic decision making and policies.
Some problems associated to modelling in pollution prevention and control are analyzed, considering the modelling of pollutants fate and dispersion in the environment, environmental impact of production and consumption, modelling in environmental remediation and clean-up, as well as modelling approaches on the relationship between economic development, pollution control and costs and benefits in environmental purification. It is highlighted that models offer a support for understanding environmental behavior and forecasting the effects of actions developed for environmental remediation and pollution mitigation. The main upshot is that the translation of results in practice as support for decision and policies making in socio-economic, social and environmental systems should be an intrinsic part of the modeling process, instead of being separated from it.

Key words: modeling, environmental decision making, optimization, environmental management

Received: October, 2013; Revised final: February, 2014; Accepted: March, 2014

* Author to whom all correspondence should be addressed: viorel.matei@spiruharet.ro, laura.ungureanu@spiruharet.ro