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Amós Nascimento

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A Conceptual Framework for Sustainable Water Management: The Case of the Piracicaba River Basin, Brazil

By: Amós Nascimento

Amós Nascimento

Universidade Metodista de Piracicaba – UNIMEP

Rodovia do Acúcar Km 156- Campus Tazuaral

Piracicaba, São Paulo 13400-911

Brasil

Phone: +55 (19) 3124-1528

Fax: +55 (19) 3124-1500

Email: asnascim@unimep.br

Web: www.unimep.br

Amos Nascimento obtained his BA at EMEC in Buenos Aires (Argentina), his Masters in Social Sciences at the Methodist University of São Paulo (UMESP) in São Paulo (Brazil) and Doctoral Studies at the Frankfurt University (Germany). He has worked at UMEESP, Evergreen State College, Frankfurt University and UNIMEP. He has done research in various settings and institutions in Latin America, Europe and in the United States – especially in the American Northwest and Southwest – on a series of philosophical, cultural and social issues. He is presently on the board of two journals, IMPULSO and Revista de Educação do COGEIME in Brazil, has been member of several local and international committees, and has been Chair of the Brazil 500 Commission at the Universidade Metodista de Piracicaba. He is presently the Director of the Office for International Affairs of the Methodist University of Piracicaba, member of the University Council and of the Piracicaba International Committee.

ABSTRACT

This proposal aims at presenting a conceptual discussion on the development of an ethic-oriented “Framework for a Sustainable Water Management” for the Piracicaba River Basin in Brazil. Piracicaba is a region within the São Paulo state with a situation very similar to that of developed countries, which reached the limit of their water resources and have taken radical measures towards sustainability. Industrially developed regions in Europe and North America have progressively addressed their water management through policy reforms, specific regulations, pricing and taxation policies, saving systems and pipelines, new technologies, as well as recycling alternatives and popular awareness through environmental activism and education. The same is now happening in developing countries, especially after the ECO-92 in Rio de Janeiro. In view of the different experiences and perspectives available, a conceptual framework is needed to orient research of historical data, assessment of available technologies and guidance for future decision-making concerning water resources. In our view such a framework can lead to a cultural change according to the principles of sustainable development for the Piracicaba River Basin.

The framework developed for Piracicaba involves five inter-related issues: (1) the establishment of conceptual perspectives based on philosophical, social, political and cultural aspects of water resources; (2) the development of an international framework for the exchange of information on water management that accounts for the specificity of different cultural, historical and geographical settings; (3) the research of existing knowledge and technologies that provide concrete solutions of given problems; (4) the establishment of formal academic, industrial and political links at the local, regional, national and international level in order to ensure the application and popularization of the results; and (5) guidelines to evaluate actions, aiming at enhancing environmental management, sustainable development, social participation and life quality for society at large.

This initiative – which emphasizes a comprehensive approach on the management of water resources – may be of use not only in the Piracicaba River Basin, but could be shared with other regions, as well as receive newer inputs from other experiences elsewhere.

The Piracicaba River Basin includes the rivers Piracicaba, Capivari e Jundiá and integrates the Piracicaba River Basin Committee (Comitê das Bacias Hidrográficas dos Rios Piracicaba, Capivari e Jundiá). The region can be characterized in two aspects: First, it is considered as one of the most industrially developed regions in Brazil, which suffers from a series of environmental problems such as lack of enough water for human use, low quality of the available drinking water, need of better wastewater treatment, lack of adequate deposition for solid domestic, industrial and hospital waste, water seeping through landfills, as well as intense air pollution caused by sugar cane plants and the possibility of new problems with the implementation of thermoelectrical plants to supply electricity for larger areas in Brazil. Secondly, however, the Piracicaba region has one of the greatest indexes of environmental awareness in Brazil. The aggravation of the life quality in the last 30 years, the extraction of water resources from the region to serve the metropolitan area of São Paulo, and especially the effects that these measures had on the Piracicaba River, motivated popular and political reaction to mega-projects on environmental grounds, leading to the development of environmental policies and regulations which are being applied concretely by municipal, state and federal authorities.

The Methodist University of Piracicaba is part of this context and has developed a project to develop a multi-disciplinary proposal involving law, political science, philosophy, microbiology, chemical engineering, environmental engineering and other areas to address this double issue. The greatest challenge, however, has been the development of a wider “Framework for a Sustainable Water Management,” which relies on the history and culture of the Piracicaba River Basin as well as on the need of guidelines to orient policy-makers, industrial partners, the general population and other stakeholders in the region. This framework is the platform that shall enable a change of culture in the management of water resources, according to the principles of sustainable development.