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title: **Environmental education and the Guarani Aquifer in a documentary: An approach to a broader educational process**

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INTRODUCTION

The Guarani Aquifer has continental dimensions, extending over some 1.2 million km² within the Paraná sedimentary basin, South America. Their waters are extensively utilized for four countries (Brazil, Argentina, Uruguay and Paraguay) for several purposes like in water supply systems, industries, recreation and irrigation. More than 1,000 wells are expected to exploit the aquifer, according to public and private interests, but the right number is unknown due to the existence of a lot of clandestine ones. The over-exploitation without any criteria and support affect the quantitative and qualitative potential of their waters.

Such problem is an example pointing out the need to educate the society to face the challenges inherent in the relations among the human beings themselves and with nature that involves interests and fights among different groups concerning to the environmental goods. This paper focuses this question, discussing the educational task and presenting a proposal of an educational work about the Guarani aquifer.

Since the 1970s, the educational field has been requested to contribute with the reflections and actions to deal with the environmental question, as demonstrate the several international meetings already organized, which indicated objectives and general guidelines for the Environmental Education (EE). The First Intergovernmental Meeting on Environmental Education was held in 1977 and it was organized by UNESCO in Tbilisi, Georgia. General guidelines for environmental education were established in that meeting.

However, despite those recommendations, EE projects have shown great variations concerning their theoretical-methodological benchmarks, since they reflect the varied conceptions about the causes and proposals for action when facing environmental problems. Moreover, they also reflect different understanding of education itself. Although the socio-political-economical aspects were highlighted in the guidelines proposed in Tbilisi, breaking up with a view of ecological reductionism, EE still has a great tradition as a way of studying nature and promoting individual behavioral change.

Breiting and Mogensen (1999) point out that all environmental issues involve conflicting interests, that appear at least at three levels: individual (the conflict exists between incompatible needs and wishes, often expressed as personal dilemmas); social (the conflicting interests exist between various groups and/or individuals) and the structural level of society (the conflicting interests regarded as conflicts between political decisions and market forces or economical mechanisms). For these authors, if the EE is to deal with the real environmental issues, it has to face these three levels of conflicting interests.

From this approach, I consider that the projects on EE must deal with three dimensions (Carvalho, 2006):

- knowledge: to deal with facts and concepts from the natural/social sciences, as well as with the process of production of the knowledge itself, that help us to understand the process of construction of our conflicting relation patterns among human beings organized in the societies and among societies and nature;
- values: ethics and aesthetics, for reviewing the basis of present relation and constructing new standards of relation with the natural environment;

- political participation: for the development of the citizenship and construction of a democratic society, giving voice to all citizens in order to participate of the decisions affecting everybody.

Under these views, I present an educational proposal to deal with the questions related to Guarani aquifer from a documentary focusing it.

THE FILM GUARANI: CAMINHOS DAS ÁGUAS

The film presents an “encounter” with the Guarani Aquifer, starting with the conduction of a scientific research, in which samples of its waters in different Brazilian cities were collected. Parallel to the initial exposure of some basic information of techno-scientific nature, the esthetic look makes colors stand out, shapes and sounds pop out of the images of natural elements linked with the aquifer — just like the ones in technological devices and human constructions geared to its water collection, treatment and distribution.

Aspects of the society-water relation emerge from different situations found in field work, revealing the problematic issue related to the exploration of those waters to the spectator through a set of information and the situations presented. The relation among Science, Technology and Society, present in the Guarani watercourse, and important for reflections on the present environmental crisis, can be stated through this production.

When the over-exploitation and contamination problems are presented to the spectator, some tracks are provided in order he or she not makes a commitment only in an individual level relating to the water care. The spectator must perceive how the problem involves interests of several segments, i.e. public and private interests that are behind these risks. So, initiatives to take care of the environmental resources extrapolate the individual action of each citizen, but need them in a collective action in order to demand measures from decision makers for attending the collective interests of the population.

By this way, considering Guarani Aquifer, it is clear for all the need to establish norms and regulations for avoiding its indiscriminate use, contamination and other harmful problems to public interests, reason by which it is necessary focus on interest conflicts that this thematic includes. The educational process must reach this level of political participation instead of only giving “conclusive” (many times not really conclusive) information and training on the acquisition of desirable behavior.

Considering the knowledge dimension linked to Guarani aquifer, it is necessary as well to display the process of its construction, with the subjacent conflicts and interests involved in it. Sarewitz (2004), discussing the nature of science and its influence on the environmental issue, argues that political controversies with technical underpinnings are not resolved by technical means.

Drawing from examples of some environmental issues, he explores the idea that scientific inquiry is inherently and unavoidably subject to becoming politicized in environmental controversies. He presents three reasons for this:

- first, science supplies contesting parties with their own bodies of relevant, legitimate facts about nature, chosen in part because they help make sense of, and are made sensible by, particular interests and normative frameworks;

- second, competing disciplinary approaches to understanding the scientific basis of an environmental controversy may be causally tied to competing value-based political or ethical positions. The necessity of looking at nature through a variety of disciplinary lenses brings with it a variety of normative lenses, as well;
- third, it follows from the foregoing that scientific uncertainty, which so often occupies a central place in environmental controversies, can be understood not as a lack of scientific understanding but as the lack of coherence among competing scientific understandings, amplified by the various political, cultural, and institutional contexts within which science is carried out.

In accordance with the authors already referred to, I point out that the environmental question in general is closely associated with socio-political issues and the conflicts that come with them. From this perspective, for educational work based on environmental issues, it is necessary to change traditional approaches that try to show conclusive knowledge and behaviors looking for the harmony among human beings and nature: more important that the concepts of harmony and balance, will be the concepts of crisis, controversy, polemics and, in the specific case of environmental education, the socio-environmental conflict (Nicolai-Hernández, Carvalho, 2006).

FINAL CONSIDERATIONS

According to Nicolai-Hernández and Carvalho (2006), the option of working with controversial issues is presented as an interesting possibility of EE, which implies a positioning far from the liberal environmental ideas in which the idea of an “apparent consensus” on the environmental issue is being encouraged, thus generating conditions to ideologically dissimulate and disguise the controversies and the socio-environmental conflicts.

Strauss and Westland (2005) emphasize the importance of learning about controversial issues, that can build skills such as listening, debate, handling conflict, self awareness, distinguishing between fact and opinion, creative problem solving, critical thinking, ethical reasoning, recognizing bias, evaluating evidence, justifying an argument, logical reasoning, etc, critical skills for survival in an increasingly complex world.

Agreeing with these authors, I emphasize the benefits of dealing with the controversies, conflicts and uncertainties that take part in the environmental question. Considering Guarani aquifer, there are several problems involving its use and protection that must be presented and discussed with the participation of the society.

However, as Gayford (2002) pointed out from an investigation involving science teachers, the inclusion of controversial issues within the school means a challenge that we need to face. It is not easy to organize classes in which the subjects include uncertainties, conflicts and dilemmas, which means a change in the traditional approaches to teach and learn.

In conclusion, EE actually implies more than to deal with conclusive knowledge and specific behaviours. It means the challenge to review and change our world’s visions, values and practices, discussing and looking for more democratic decisions, a learning process that involves all citizens of the society, inside and outside schools.

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