DECISION-MAKING POLICIES FOR THE SALGADO RIVER BASIN, CEARÁ – BRAZIL

Francisco de Assis Vilar Sobreira Júnior
Universidade Regional do Cariri
Juazeiro do Norte, CE, Brasil
E-mail: jr2_vilar@hotmail.com

Rodolfo José Sabiá
Universidade Regional do Cariri
Juazeiro do Norte, CE, Brasil
E-mail: rodolfo.sabia@urca.br

Anna Flávia de Oliveira Lima
Universidade Regional do Cariri
Juazeiro do Norte, CE, Brasil
E-mail: annaflavia.lima@gmail.com

Valério Antonio Pamplona Salomon
Universidade Estadual Paulista Júlio de Mesquita Filho
Guaratinguetá, SP, Brasil
E-mail: salomon@feg.unesp.br

Fernando Augusto Silva Marins
Universidade Estadual Paulista Júlio de Mesquita Filho
Guaratinguetá, SP, Brasil
E-mail: fmarins@feg.unesp.br

ABSTRACT

The parliament water of "Salgado" river, an event that guided the actions and recommendations for the future of the waters of the "Salgado" River, south of the Brazilian state of Ceará, was obtained through a democratic process, with 100 public, private and the third sector institutions. We have intended to define a model of development compatible with the aspirations of society as regards to the priority use and the water quality standard we want to achieve, and what the necessary actions and strategies for multi-criteria analysis of the instrument national water policy, the Framework water. The main goal of the analysis is to decide what is the appropriate policy to meet the purposes of the Parliament of the Waters of the "Salgado" River. So we have used the Analytic Hierarchy Process method (AHP): the criteria was analyzed economic, socio-economic, social, environmental and environmental; alternatives were defined essentially preservationist policies, sustainable policies and essentially economic policies. Preliminary results indicate that the application of AHP method was effective in decision made.

Keywords: AHP, Environmental Policies, Waste Management.

1. Introduction

The disordered growth associated with the degradation of water quality process has been created serious problems in the sub-basin of the Salgado river in the Brazilian state of Ceará. Thus, the pollution of rivers in the semiarid region of northeastern Brazil is affected by intermittent rivers, the rainfall irregularity and lack of a policy of efficient and participatory management for the semiarid region. Decision-making, with a focus on advanced, aims to evaluate what measures should be adopted and the impacts of this to improve the management of water quality in the watershed quoted.

The purpose of the research is to find out which policy is most effective to meet the objectives of the Parliament Water of "Salgado" River.

2. Literature Review

Analytic Hierarchy Process (AHP) is a method for ranking of alternatives when multiple criteria and sub-criteria are presented in decision-making process (Tahriri et al., 2008). The AHP has proved to be an appropriate reflection of the judgments in decision-making processes of complex decisions method. (Awasthi and Chauhan, 2011; Bottero *et al*, 2011;. Gao and Hailu, 2012).

The AHP decomposes decision problems in a hierarchical structure, and uses qualitative and quantitative information to derive ratio scales between the elements of the decision in each hierarchical level using paired comparisons. (Dambatta-Bello *et al*. 2009) AHP making one of the preferred methods for multi-criteria evaluation. There are many different applications (e.g. Expert Choice and Super Decisions), problems in applications such as waste management (Contreras *et al*., 2008).

According to Saaty (2008), a method of multicriteria decision making, AHP balances the interactions between decision criteria and synthesizes the information into a vector of preferences between alternatives. AHP is often used to solve complex decision problems with multiple goals and multiple criteria, while it is widely used to determine the weights of the evaluation index. (Dong *et al*, 2010;. Xie and Tang, 2010;. Vidal *et al*, 2011).

Kannan *et al*. (2008) created a model of multicriteria decision making using AHP and fuzzy analytic hierarchy process to evaluate the collection centers for product recovery in the tire manufacturing industry in India.

3. Hypotheses/Objectives

This study aims to show what is the alternative to be able to meet the objectives of development policy compatible with the aspirations of society using the AHP model.

4. Research Design/Methodology

For the choice of appropriate policy it was based on the application of AHP to decide out which policy is more effective, the criteria were analyzed economic, socio-economic, social, environmental and environmental and alternatives were defined essentially preservationist policies, sustainable policies and policies essentially economic. The scale used, adopted values of 1-9, with 1: equal importance and 9: absolute importance.

5. Data/Model Analysis

Figure 1 shows the hierarchical structure with alternatives, criteria and sub-criteria.
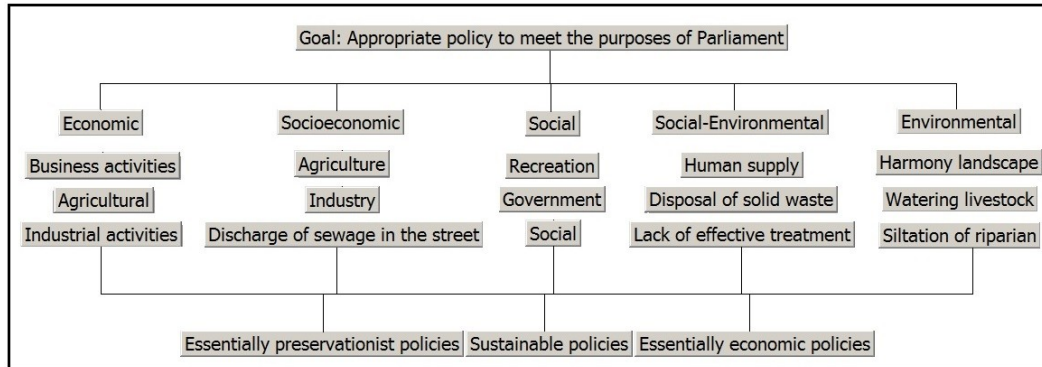

Figure 1 Hierarchical structure for selection of water management policy.

Table 1 shows comparisons between the two by two criteria. With the weights described above it gave the consistency index of 0.03, below 0.10, the considered limit accepted in the literature.

Table 1
Comparisons between the criteria

	Economic	Soioeconomic	Social	Social-Environmental	Environmental
Economic	1	7	8	7	2
Socioeconomic	1/7	1	2	1	1/6
Social	1/8	1/2	1	1/2	1/4
Social-Environmental	1/7	1	2	1	1/6
Environmental	1/2	6	4	6	1

Table 1 Matrix of the comparisons of criteria

The economic criteria directly influence decision-making, indicating essentially preservationist policy as one that meets the society aspirations.

6. Limitations

A major limiting factor is that the classification of bodies of water is an instrument of the Brazilian water resources policy, peculiar that is not reflected in other countries, so their study is summarized the studies carried out in Brazil or by Brazilians, thus having, a small number of publications that use the AHP method as decision making. Thus, it forces us to use environmental management work as a basis for the development of the study.

7. Conclusions

It is clear that the study of problems of water resources management related to management instrumentation of Brazilian politics is a challenge that must be faced every day so that the AHP method can contribute to decision making in order to meet the purposes and remedy faults policies to be adopted.

Our findings have implications for the use of appropriate alternative for estimating the benefits of improvements in water resource management, this application of AHP method allowed the hierarchy due to their relevance, and establish the priority with respect to the influence they exert about the alternative to making a decision to Parliament Water of "Salgado" River.

8. Key References

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