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Stakeholders-based multi-criteria policy analysis in maritime transport: from theory to practice

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Abstract

This paper discusses on the applicability of a combined multi-actors multi-criteria method developed to facilitate policy making in the area of maritime transport. The methodology exploits the operational synergy of two MCDA techniques (PROMETHEE and AHP) in a multi-actors evaluation environment. This combination seeks to improve both methods' applicability and decrease their potential deficiencies and limitations while their application in a Group Decision environment facilitates the building of consensus among the involved stakeholders through the provision of a transparent participatory policy selection mechanism. The methodology is applied on a real case involving a stakeholders' - based evaluation of 4 key policies for supporting the Greek coastal maritime sector. The results of the case study regarding the Multi-criteria evaluation of the examined policies, the experts and the individual stakeholder' groups preferences and priorities, as well as the opinion of the Greek coastal maritime transport stakeholders in relation to the necessity, the usability and the applicability of this group decision multi-criteria mechanism are analyzed and discussed.

Keywords: policy support; multi-criteria; group decision; maritime transport; participatory methodology

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1. Introduction

Policy making is a challenging and highly complex process. Decision making, as a process linking policy formulation to its actual implementation, is characterized by a high level of complexity and arduousness. Reaching the appropriate decision able to address a variety of –often conflicting- needs and priorities, varying from economic to social ones, involves the optimization of a multitude of parameters and a complex interplay of information, interests and opinions of different social groups.

Being interlinked to many other sectors (e.g. national economy, social cohesion, environment, urban development, tourism etc) transport policy development has been proved to be a rather complex task that needs special attention and calls for sophisticated methods to facilitate the decision makers on assessing different aspects of each policy alternative. To support decision making, a variety of methods have been developed over the years suitable for various evaluation environments. Examples of some well know methods are those of the Cost-Benefit Analysis, the Cost-effectiveness analysis, the Economic Effects Analysis, the balance sheets, and the Multicriteria analysis. In the maritime transport sector - examined in this paper-, policy is formulated and implemented under conditions of multiple objectives (deriving from the great number and the variety of the involved stakeholders) and constraints in an environment characterized by strong complexity in the relations among jurisdictions, administrators, politicians and the industry (Roe, M., 2009).

Being a strong analytic tool that supports decision making under uncertainty and consensus building among all involved actors in a well explicit way, the Multi Criteria Decision Analysis (MCDA) became over the years a popular evaluation method with numerous recorded applications addressing complex problems. In most real-world policy situations the Decision Maker has to balance many alternatives, involving many stakeholders, and a large spectrum of potential impacts. In such cases, optimization, as the ultimate goal of the policy making, is replaced with satisficing, defined as the identification of an acceptable (or satisfactory) solution/alternative to a problem instead of a socio-economically optimal solution. Furthermore, the lack of one single & central goal (something common to all integrated policies such as those in maritime transport sector), combined with a great number of impacts that cannot always be monetised, renders MCDA methods more suitable for supporting policy evaluation than other widely used financial-economic methods (e.g. CEA,CBA). The most widely used MCDA techniques applied in the field of transport are the multi-attribute theory variants (AHP, MAUT, MAVT etc), the outranking methods (PROMETHEE, ELECTRE) and the regime analysis. The selection of the appropriate evaluation methodology is crucial and needs to be carefully examined in relation to the problem's particularities, needs and constraints (e.g. in terms of time, available data, resources etc); using different methods can sometimes even lead to divergent results (Finco, A. & Nijkamp, P, 1997). Recently, the combination of various MCDA methods starts gaining ground facilitated by the advancing technologies that ease their use. The combined method approach facilitates policy making by reviewing preferences and judgments derived from more than one MCA methods (Mysiak, J.,2006).

The present paper discusses on the applicability of a combined multi-actors multi-criteria method developed to facilitate policy making in the area of maritime transport. The methodology exploits the operational synergy of two MCDA techniques (PROMETHEE and AHP) in a multi-actors evaluation environment. The proposed combination of PROMETHEE & AHP seeks to improve both methods' applicability, decrease their deficiencies, while at the same time their application in a multi-actors environment facilitates the building of consensus among actors through the provision of a transparent participatory policy selection mechanism. In the particular case of transportation projects' appraisal, stakeholders' participation is considered a very important asset since it helps identifying and including in the analysis the different priorities of stakeholders, increases the acceptance rate of the project, strengthens the robustness and quality of the decision and overcomes problems with the criteria/ alternatives weights (Macharis, 2007).

2. The "Combined MCDA methodology"

The policy evaluation mechanism is based on a multi-method approach applied in a multi-actors environment. The methodology is structured around 3 building blocks: the system mapping, the operational synergy of 2 MCDA methodologies (PROMETHEE & AHP) and the exploitation of 2 independent mechanisms in the evaluation