



## Research article

## Behavioral patterns of environmental performance evaluation programs

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## ABSTRACT

During the past decades numerous environmental performance evaluation programs have been developed and implemented on different geographic scales. This paper develops a taxonomy of environmental management behavioral patterns in order to provide a practical comparison tool for environmental performance evaluation programs. Ten such programs purposively selected are mapped against the identified four behavioral patterns in the form of diagnosis, negotiation, learning, and socialization and learning. Overall, we found that schemes which serve to diagnose environmental abnormalities are mainly externally imposed and have been developed as a result of technical debates concerning data sources, methodology and ranking criteria. Learning oriented scheme is featured by processes through which free exchange of ideas, mutual and adaptive learning can occur. Scheme developed by higher authority for influencing behaviors of lower levels of government has been adopted by the evaluated to signal their excellent environmental performance. The socializing and learning classified evaluation schemes have incorporated dialogue, participation, and capacity building in program design. In conclusion we consider the ‘fitness for purpose’ of the various schemes, the merits of our analytical model and the future possibilities of fostering capacity building in the realm of wicked environmental challenges.

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## 1. Introduction

Since the 1970s, environmental protection has become one of the core tasks of the government. Global, regional, and national

policy makers have declared their ambition to improve the environment and pursue sustainable development driven by universally agreed principles and goals at the UN Conferences related to the environment, the Millennium Development Goals (especially goal No. 7 concerning environmental sustainability) and based thereon various implementations of the Agenda 21 cascaded down to national and local level. Measuring public service performance has stimulated an interest in using quantitative evaluation schemes in the public sector since the 1980s to improve efficiency (Downs and Larkey, 1986) and to enhance control and accountability of management behaviors, including environmental management (Halachmi, 2002; Simões and Marques, 2012).

In accordance with these broad developments a global trend of utilizing quantitative information to indicate the state of the environment and to evaluate efforts taken to improve it has emerged. This has occurred at different geo-political levels – global, regional and national – and according to different frameworks of reference – most notably, sustainable development (Mauerhofer, 2008), environmental performance management (Ewing et al., 2010) and quality of life (Ferreira and Moro, 2010).

*List of abbreviations:* CIESIN, Center for International Earth Science Information Network; CSDR, China's Sustainable Development Strategy Report; DEFRA, Department of Environment, Food and Rural Affairs; EPA, Environmental Performance Assessment; EPI, Environmental Performance Index; EPR, OECD Environmental Performance Review; ESI, Environmental Sustainability Index; EU, European Union; GMS, Greater Mekong Subregion; ISD, Indicators of Sustainable Development; MCE, Model City for Protecting the Environment; MDGs, Millennium Development Goals; MEP, Ministry of Environmental Protection; ODPM, Office of the Deputy Prime Minister; OECD, Organization for Economic Cooperation and Development; QECCUE, Quantitative Examination of Comprehensive Control of Urban Environment; QLA, Quality of Life Audit; SDA, Sustainable Development Audit; UA, Urban Audit; UN CSD, United Nations Commission on Sustainable Development; YCELP, Yale Center for Environmental Law and Policy.

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Those efforts were intended to facilitate diagnosis of environmental problems and control agents, especially governments, who are capable of making a difference.

At the same time, the ‘wicked’ nature of many environmental problems questions the idea of control but calls for public managers to perform a role as collaborative capacity builder to facilitate learning, socialize environmental stakeholders and legitimize environmental actions (Hofstede, 1978, 1981). Weber and Khademian’s (2008) recent review identified three striking features that resonate strongly with the context of wicked environmental issues of concern here. First, wicked problems are unstructured in that the causes and effects are extremely difficult to identify and model. Second, wicked problems comprise multiple, overlapping and interconnected subsets of issues that cut across multiple policy domains and levels of government (Weber and Khademian, 2008). Finally, Weber and Khademian note that wicked problems are relentless.

In confronting wicked problems, where stakeholders are highly diverse and the output and effects of an intervention are highly uncertain, there have been growing calls amongst scholars to adopt “socializing and learning” management tools to create shared values and facilitate collaborative actions (Hajkowicz, 2009; Larson and Lach, 2008; O’Leary and Bingham, 2003, 2009; Ouchi, 1979; Rhodes and Murray, 2007; van Elsacker et al., 2008; Zagonari, 2008). In this way a broader range of concerns and potential impacts can be considered beyond those of the immediate issue under scrutiny. However, the existing literature has mainly examined the scientific merit of some of the quantitative evaluation schemes (Benedetti et al., 2008; Finn et al., 2009; Gouveia et al., 2004; O’Leary, 1997, 1999; Roberts, 2006; Rogers and Louis, 2009) but overlooked the potential of using evaluation for facilitating learning among evaluators, environmental managers, and the public (Pollitt, 2013).

Our paper aims to develop a taxonomy of behavioral patterns in environmental management and to map against it ten purposively selected environmental performance evaluation programs at a national, regional, and global level, regarding their stimulated behaviors. The categorization of environmental management behaviors is built upon existing literature which we newly combine in an innovative matrix. Regarding the mapping, we mainly adopt a desktop research method of data collection, complemented with primary data collected from the first author’s participation in OECD environmental performance review for China and the assessment of provincial environmental performance in China by the YCELP and its partners. We found that all schemes reveal environmental performance information and help diagnose environmental abnormalities, while some have incorporated creative design features to go beyond diagnosis and to stimulate learning, influencing and bargaining, and/or socializing and learning. Diagnosis focused evaluation schemes hold a sharp dichotomy between evaluators and the evaluated and have been developed as a result of technical debates concerning data sources, methodology and ranking criteria. Learning oriented scheme is featured by an epistemic community, including both evaluators and the evaluated engaging in free exchange of ideas, mutual and adaptive learning. Scheme developed by higher authority offers political incentive for influencing behaviors of lower levels of government and has been adopted by the evaluated to signal their excellent environmental performance. Schemes developed by hub organizations of networks comprised of countries of different socio-economic and environmental conditions promote consensus building and environmental improvement through socialization and learning mechanisms such as dialogue, participation, and capacity building.

The next section shows the creation of the analytical tool categorizing management behaviors for addressing environmental

challenges in a matrix form. Afterwards for the mapping working step, we first provide an overview of the ten evaluation schemes and then analyze their working procedures as well as behavioral patterns, and allocate the schemes within each classification quadrant of the matrix. Lastly, the paper discusses these results of this allocation and ends with conclusions.

## 2. Categorization of environmental management behaviors

Addressing environmental challenges requires both scientific knowledge and collective actions. Usually, it involves multiple stakeholders in problem identification and solution finding for pollution control, eco-conservation, and green transformation. Experts offer professional knowledge. Industrialists possess information on their production processes and associated environmental impacts that may or may not have been made public. Local residents understand practical know-how and local conditions. The government enacts and enforces regulations and policies to prevent and control environmental harm and to enable environmentally friendly behaviors (Marques and Simões, 2008). Even more parties are involved if the geographical scale of an environmental challenge is at a regional or global level, e.g. climate change. It is understandable that those different actors pursue their self-interest and adopt different formulas in assessing costs and benefits associated with environmental problems and solutions.

Efforts in addressing environmental challenges may take different forms. It can be scientific research conducted in labs, by a group of scientists who share common goals. At the same time, collective actions are necessary among actors with diverse backgrounds, interests, and objectives. Information asymmetry is rampant among participants in those processes in terms of possession of scientific knowledge, level of individual contribution, and calculation of costs and benefits. Environmental impact of individual efforts may be uncertain or not immediately visible. How to manage those efforts and processes has become a tremendous challenge.

Scholars have studied the challenge of evaluating each individual’s contribution and distributing rewards in an equitable manner to ensure continuous cooperation within an organization. By whether output from individual efforts are measurable and whether members share common values or objectives, an organization can be managed by adopting one or more of the following three different mechanisms: markets, bureaucracies, and clan (Ouchi, 1979). Markets are applicable when effects of individual efforts are measurable, no matter whether or not members share common interests as they can negotiate on a fair share for oneself based on common knowledge of individual contribution. When individual output not measurable but members share common values and/or objectives, bureaucracies are a desirable form of management for organizing collective actions. When neither is output measurable, nor do individuals share common interests, it is better to manage as a clan by emphasizing socialization and creation of shared values (Ouchi, 1979). Thus, performance evaluation then can be used for diagnosing, bargaining, learning, and legitimizing in the following four scenarios where both output is measurable and objectives are shared by members, output is measurable but objectives are not common, output is not measurable but objectives are common, and neither is output measurable nor are objectives common, respectively (van Elsacker et al., 2008).

The above line of reasoning can be extended to the realm of environmental management. Addressing environmental challenges usually involves multiple organizations and individuals. Furthermore, not being given tasks to perform by the management, societal actors (usually) together with the government define and initiate desirable courses of actions. When societal actors share

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