A REALISTIC APPROACH IN EVALUATING PROGRAMS AND PROJECTS TOWARDS THE PROTECTION AND RESTORATION OF ENVIRONMENT

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ABSTRACT

This paper presents the incorporation of realistic practice into the formulation of evaluation methodology of activities and projects concerning the protection and restoration of environment.

Realistic Evaluation, founded in scientific realist philosophy, comprises a new approach in program evaluation, offering a complete blueprint for evaluation activities. Combining theory and method, quality and quantity, focuses on testing theories of how outcomes are generated by specific mechanisms, fired and activated in particular contexts. Given that environmental interventions are closely connected with and affect social world, its commitment to the belief that evaluation research depends on the investigation of causal explanation offers to environmental planning and development an actual practice into the conduct of evaluation.

ΠΕΡΙΛΗΨΗ

Η μελέτη αυτή παρουσιάζει τον τρόπο σύμφωνα με τον οποίο η ρεαλιστική πρακτική ενσωματώνεται στον σχεδιασμό των μεθόδων αξιολόγησης των έργων και των προγραμμάτων που στοχεύουν στην προστασία και στην αποκατάσταση του περιβάλλοντος. Η ρεαλιστική αξιολόγηση, θεμελιωμένη στον Επιστημονικό Ρεαλισμό, αποτελεί μία νέα προσέγγιση στην αξιολόγηση προγραμμάτων, προσφέροντας ένα πλήρες κανονιστικό πλαίσιο για την διαδικασία της αξιολόγησης. Συνδυάζοντας την θεωρία με την μέθοδο, όπως και τις ποιοτικές με τις ποσοτικές προσεγγίσεις, εστιάζεται στην εξέταση των θεωρητικών θέσεων που ερμηνεύονται και υποστηρίζονται με τους τρόπους με τους οποίους διάφορα αποτελέσματα προκαλούνται από συγκεκριμένους μηχανισμούς, όταν οι τελευταίοι ενεργοποιούνται σε συγκεκριμένο περιβάλλον. Δεδομένου ότι οι περιβαλλοντικές παρεμβάσεις συνδέονται στενά, αλλά και επηρεάζουν την κοινωνία, η πεποίθηση της ρεαλιστικής αξιολόγησης ότι η έρευνα της αξιολόγησης πρέπει να στηρίζεται στην εξέταση της αιτιολογικής ερμηνείας των φαινομένων παρέχει την δυνατότητα μίας ουσιαστικής
1. INTRODUCTION

The need to integrate knowledge with action is nowhere greater than in the area of global environmental change (changes in climate, biological diversity, natural resource use and management, air quality, water resources, toxic and hazardous substances and natural disaster reduction). This is a field with linkages to a broad range of planning, monitoring and evaluation issues, which are increasingly interrelated with one another and with the universe of socioeconomic policy issues in general. These linkages add significant complexity to scientific analyses and policy responses required to address environmental concerns adequately.

The conceptual refinement, as well as the methodological development of evaluation must include the logical tools offered by philosophers who study evaluation’s nature [1], so that an overall improvement can be accomplished. Toward this task of improvement through understanding, Realistic Evaluation [2] comprises a new evaluation paradigm, which is based on the idea that programs deal with real problems, while its primary intension is to propose realistic developments in policy making that benefit the whole range of programs’ stakeholders. The epistemological base of this evaluation perspective follows the realism model of scientific explanation [3,4,5], and is grounded on the generative principles of causation theory. The generative theory sees causation as acting both internally and externally, where cause is conceived as describing the transformation potential of phenomena. A program is not conceived as a “working” one; rather it is the action of stakeholders that makes it work. Thus, the causal potential of any initiative must take the form of providing reasons and resources to enable programs’ stakeholders to make them work. Accordingly, an event or action may generate a change if only it is in the right condition in the right circumstances.

Methodologically, the approach stresses the need to give research the task of testing theories of how program outcomes are produced by specific mechanisms and contexts, so that research involves making inter- and intra- program comparisons to discover which context-mechanism-outcome configurations are efficacious. Consequently, Realistic Evaluation perceives programming as an endeavor to embody knowledge that has already identified what works for whom in what circumstances. This knowledge is accumulated by program and empirical research, providing policy makers with theoretically based typologies of effective context-mechanism-outcome combinations.

In order to construct and test context-mechanism-outcome pattern explanations, evaluators need to develop a teacher-learner relationship with program’s stakeholders in which the medium of exchange is context-mechanism-outcome theories and the function of that relationship is to refine that theories. This teaching-learning process prefigures a division and hierarchy of expertise across the stakeholders in a program with respect to the issues being investigating. The research act thus involves “learning” the stakeholder’s views, formalizing them and “teaching” them back to him, who is then in a position to comment upon, clarify and further refine the key ideas concerning the program.

Although Realistic Evaluation comprises fundamentally a scientific proposition for the evaluation process in social field, it is worthwhile an attempt to be made to adapt the scientific and methodological rules, and develop accordingly a design of evaluation research in programming of environmental innovations. The design that will be proposed follows a brief description of the “logic” of the realist research strategy.
2. THE REALISTIC APPROACH OF EVALUATION

Following the Wallace’s [6] “wheel of science”, the research design for realistic evaluation is underpinned by theories, which are framed and are concerned with the identification and explanation of regularities. Various hypotheses can be derived from these theories, stating where and how regularities can be found. These hypotheses are tested through observations, which produce generalizations-conclusions. The latter may or may not conform to those expected from a theory, revealing either some critical weakness in the research design intended to test the theory or the theory itself is in need of revision.

The starting point of a realist design is the conception of theory and more precisely the way of understanding the constituents of theory: theories and the hypotheses derived from them must be framed in terms of propositions about how mechanisms are activated in particular contexts to produce outcomes. According to this style of hypotheses making, interventions (programs) must be broken down so that one can bring to light the characteristics of the corresponding mechanisms that might produce outcomes in a specific context and the preconditions necessary to sustain the outcomes. Choosing and applying a proper method of data collection and analysis to test such hypotheses, specifications can be made, discovering what works for whom and under which circumstances. The knowledge obtained feeds back into further theoretical development or leads to a robust decision-making.

Trying to develop transferable and cumulative knowledge from evaluation research, the evaluation design must be oriented to context-mechanism-outcome pattern configuration, which is a proposal stating “what is about a program that works for whom in what circumstances”. The conjectured context-mechanism-outcome configuration is the starting point of an evaluation, while the refined context-mechanism-outcome configuration is the result of an evaluation process. Consequently, evaluation must be focused on “why” a particular program works through an understanding of the action of its mechanism. At the same time, evaluators need to define the contexts within which mechanisms can be activated and work successfully. On the other hand, evaluators have to specify what are the outcomes of an intervention and how they are produced.

3. THE DESIGN OF A REALISTIC EVALUATION OF ENVIRONMENTAL ACTIVITIES

The investigation and the proposal of effective environmental interventions comprise a major problem for modern societies. Many times, in order to decide among alternative solutions, we use only one criterion, like the Net Present Value, the Internal Efficiency Factor, the Cost - Benefit Factor, the Net Annual Value, the price per product / result unit, or the Cost - Benefit factor in an annual basis. The reliability of the system, the financial demands, the restoration promptness of the system after a failure or the consequences of failures, could be used as a sole selection criterion. The evaluation of a project, using one criterion, is characterized by difficulty or even incapacity to realize an environmental impact assessment, to convert qualitative parameters into quantitative, to convert subjective perceptions and assessments into objective ones, to simultaneously take under consideration social and financial parameters (i.e. unemployment, currency availability, technological development, national self-sufficiency etc.) and to include cultural and national issues. The difficulty of evaluating (assessing) the cost and the benefit in currency units alone can be overcome by use of the multi-criteria analysis, which is characterized by its capacity to be applied to complicated and dynamic systems.
Due to the complex nature of the factors that are related to these problems, the development of a Decision Support System is essential, aiming at:

- The evaluation of future smaller projects and the examination of scenarios based on the characteristics that are related to Water Resources Management (technical, environmental, financial, social criteria), using the method of multi-criteria analysis.
- The classification of smaller projects and the definitions of the best solution.
- The sensitivity analysis of the suggested solution, according to its variable and ambiguous data, as well as the temporal planning of the suggested projects.

The sustainability, being a key factor in planning systems ever since the early 1990’s, brought under consideration the use of multicriteria methods in the corresponding field of policy-making. These methods support decision-making processes based on a variety of parameters including social, economical, pure environmental and technical criteria. Their common feature is the focusing on a particular selection procedure of the proper criteria and the emphasis on the methodology to be used to assess the possible solutions and to appraise the final results. Bearing in mind that public policies are forced to arrange contradictory and even mutually excluded targets, “the principal aim of multicriteria analysis is not to discover a solution but to construct or create something which can be considered as liable to help an actor taking part in a decision process to shape and/or to argue, and/or to transform his preferences, or to make a decision in conformity with his goals” [7].

Up to today, a variety of multicriteria methods have been used in dealing with environmental problems. For example, Briggs et al. [8] have made practical use of the PROMETHEE and GAIA methods for nuclear waste management. They are multicriteria methods appraising the result in economic terms. Dyer et al. [9] have suggested a multicriteria model for the selection of a technology for the disposal of plutonium arms. Working with solid waste, Caruso et al. [10] have developed a regional planning model for the planning of an urban solid waste management system and some heuristic method for solving the problems encountered in the process. Benson and Page [11] developed a decision support system for an effective planning and management of household recyclable solid waste. Hokkanen and Salminen [12] applied the ELECTRE III method for choosing a solid waste management system using multicriteria decision analysis. The method proved to be very useful, particularly in environmental problems where many decision makers are involved, and the quality and quantity of given data is not sufficient. A significant contribution to the Greek literature has been made by the study of Skordilis [13] who suggested a strategy evaluation in the planning of household waste disposal using the heuristic method. Karagiannidis and Moussiopoulos [14] have used the ELECTRE III method for the integrated management of municipal solid wastes in the Greater Athens Area.

Nevertheless, the proposed methodologies, although scientific substantiated, are all data-driven strategies in the way they try to ascertain information, which is both trustworthy and objective. They are all constructed under the working assumption that the subject and the subject matter of the inquiry are one and the same thing. The counter-proposition of the realistic evaluation model is that data construction should be theory-driven, so that theory, expressed as context-mechanism-outcome configurations, is the subject matter of the inquiry and the subject (stakeholder) is there to confirm, to falsify and, above all, to refine that theory. The researcher-evaluator has to indicate the program mechanism together with the context within it works better and identify the possible outcomes, intended or unintended. This context-mechanism-outcome configuration focusing comprises a process in which, and through an abstractive way, an analytic framework can be provided to interpret similarities and differences between families of programs.
The vital question that arises is how the three constituents of the context-mechanism-outcome configuration are conceptualized so that their nature and their structure can be explicitly defined. The context or the implementation environment of an intervention is defined as the pertinent factors under which the program is implemented that have the potential to condition the implementation processes and program consequences [15]. Realist evaluators seek to understand “for whom and in what circumstances” a program works through the study of contextual conditioning. Context refers to the spatial and institutional locations of social and natural situations together with the norms, social and scientific values, and interrelationships found in them. On the other hand, a mechanism identifies the processes that theoretically intervene between program or initiative and outcomes [15]. The underlying mechanism of a program explains how it works by going beneath its surface appearance and delving into its inner workings. Realistic evaluation seeks to understand “why” a program works through an understanding of the action of mechanisms. A key aspect of evaluation research design is thus to anticipate the diversity of potential program mechanisms involved, the action of which may lead to program success or failure. Finally, outcomes specify program goals together with the unintended consequences that it may produce. According to realist explanation, programs fire multiple mechanisms having different effects on different contexts and so produce multiple outcomes. Realist evaluators thus examine and analyse outcomes not simply in order to find out if programs work, but to discover if the conjectured mechanism/context theories are confirmed.

4. CONTEXT, MECHANISM, OUTCOME CONCEPTUALIZATION

4.1 Context
Assuming that programs involve multiple mechanisms, they also include multiple contexts. In the field of the evaluation of environmental intervention the key act of design and analysis in the evaluation process is thus to try to identify the situations (including people) for which a certain initiative will be beneficial. In this way, and following the Chen and Rossi [16] conceptualization of the implementation environment of an intervention, context can be defined as containing the following related dimensions:

Participant or recipient dimension
The implementation of any intervention program involves people who receive or are exposed to the effects of the project and to whom is recognized a legal interest in the program impacts. The participants’ characteristics, as well as their acceptance or reactivity to the program may condition the implementation processes and the outcomes. Taking into account information concerning participant dimension improves the understanding of program structure (design-implementation-impacts) and offers ways to tailor programs to meet the needs of several groups. At the same time, participants’ preferences and attitudes mark out the area in which they make decisions, highlighting their crucial choices. However, they are more sensitized to the mechanisms in operation with a program than they are in relation to its contextual constraints and outcomes. Thus, their personal views of choices proposed or made within an initiative comprise a part of the information base concerning mainly program mechanism.

Implementer dimension
Each intervention program is implemented and delivered to participants through implementers. They translate program theories into practice and so have to be considered as important factors in information flow. They have specific ideas on how a program mechanism works, while they may have experienced success and failures (outcomes). They are also likely to have some awareness of people and places (context) for whom and in which the program works properly. The way by which the implementers deliver the program influences and usually determines the program
implementation success. The implementer dimension addresses the relationship between the implementer and the implementation processes. Therefore, the implementers’ attributes, attitudes, as well as their relations with the participants are important concerns in this dimension.

**Planner dimension**
The design of an intervention program is, theoretically, based on the expertise and the scientific reliability of all those who participate in this process proposing scientifically substantiated methods to formulate and then activate the intervention process. Planners’ trustworthiness, being considered with regard to potential political influences, comprises a key question in the evaluation process.

**Policy maker dimension**
Policy makers approve and agree to initiate a program. They normally commission or agree that an evaluation must be undertaken and are also often the prime recipients of an evaluation report, giving to them the authority to allow program development with reference to it. To the realistic evaluator the policy maker’s account, like that of the other stakeholders, has a specific significance as a source of testable theory, which takes the form of an explicit or reconstructible context-mechanism-outcome pattern configuration.

**Delivery mode dimension**
The way a program is implemented requires both structural and administrative efforts for organizing and coordinating the operation procedures, necessary facilities, implementers and participants. These efforts usually create a kind of social climate or milieu that can influence the program implementation in characteristic, constant ways [17]. Delivery modes refer to both structural and administrative arrangements and/or social climates that convey the program implementation process [15]. Including the mode of delivery as an additional factor within the evaluation provides information on program implementation that may clarify how best to specify an evaluation model.

**Implementing organization dimension**
The implementation organization is responsible for structuring the program delivery system. Its characteristics, such as its resources, its type of authority structure and personnel composition, its existing standard operational procedures and its organizational structure may affect the program implementation.

**Interorganizational relationship dimension**
The environmental interventions are usually propelled into implementation through the cooperation of certain organizations. The relationships amongst them, formal or informal, cooperative or competitive, may affect program implementation or outcomes. Inappropriate interorganizational processes lead to setback in program implementation, which often results in program failure [18].

**Macro-context dimension**
The macro context is the broadest and more general level of social, political, economic and cultural structures within which an intervention takes place that affect both its intervening process and outcomes. The fit between the characteristics of the external environment and the characteristics of the program in operation, considered as an organization, can produce the outputs desired by the environment [19].

4.2 Mechanism
Program mechanism determines whether it works and more specifically what is about a program that makes it work. It takes the form of propositions that provide an account of how the processes on offer constitute the program. A mechanism, beyond its technical form, also demonstrates how
outputs follow from the stakeholders’ choices and their capacity to put these into practice. Environmental interventions always work through the action of mechanisms, through a process of combining resources and reasoning together. Thus, without taking mechanisms into account in the evaluation research process, program outcomes will remain unexplainable.

4.3 Outcomes
A program is created for the purpose of providing services or solving problems. These purposes are the goals or the intended outcomes and are usually used by stakeholders to guide their activities and to determine resource allocation [15]. Because goals are what a program strives to achieve [20], they are also used as criteria to assess the effectiveness of the program. In addition to goals, a program may contain some implausible goals that serve political purposes [21], while may also generate unintended outcomes that are ignored or are not foreseen by stakeholders [22]. The issues concerning intended, unintended or implausible outcomes constitute the outcome domain [15]. Outcomes provide the key evidence for the realist evaluator in any recommendation to mount, monitor, modify or mothball a program. In the area of environmental initiatives outcomes can be classified into four large categories [23]:

**Environmental dimension**
Nowadays, all who are involved in or affected by interventions of any kind fully acknowledge the great significance of the environmental parameters. The comprehension of the necessity for an eternal development commands for natural resources protection. The area of global environmental change, representing changes in climate, biological diversity, natural resource use and management, and natural disaster reduction, is in need of integrating knowledge with action [24]. The amelioration and prevention of these problems can be addressed through an interaction of the corresponding research communities and the evaluation communities. The evaluation procedures can provide more accurate and reliable results if outcomes are specified and inspected by context-mechanism-outcome combinations.

**Social dimension**
Realists conceive programs’ success as the action of stakeholders that makes them work and their causal potential as the form of providing reasons and resources to enable program participants to accept and cooperate in their implementation. The environmental changes facing earth and society can be better understood in a changing social world if program effectiveness is considered as being contingent on particular contexts and mechanisms. Incentives or side effects (e.g. employment options) must be seriously taken into account since they offer considerable compass for decision-making. The social acceptance factor is one of great importance too, since the NIMBY phenomenon (Not In My Backyard) often plays a significant role in the final selection process.

**Technical dimension**
This should be thoroughly investigated, since factors such as workability, flexibility, technological experience and maintenance matters, affect the outcome considerably.

**Fiscal responsibility and financial impacts**
Program’s allocation and expenditure of resources should reflect sound accountability procedures, and reassure their financial attribution. As is true for all programs, the performance of an investment and its contribution in environmental protection can be judged on a database that defines the situation at the outset of the program [25]. The collection of the appropriate economic data to determine impacts and risks is a rather complex task. Nevertheless, measuring the financial performance can be based on the determination of the investment and operation cost on one hand and the expected income sources on the other hand. The application of the Net Present Value or
Internal Rate of Return Methods and the calculation of appropriate ratios can evaluate the financial credibility of the program.

5. CONCLUSIONS

Realistic Evaluation construed the achievement of the purposes of evaluation through a process of program realization, where the basic task of evaluation research is one of context-mechanism-outcome configuration focusing, learning in greater and greater detail “what works for whom in what circumstances” [2]. The same process must be followed as a best practice in developing and implementing an environmental initiative. It can be described in terms of the following three phases of realization:

Realization as understanding of how outcomes are produced. Realistic evaluators have to understand how mechanisms activated by the program generate their outcomes in specifiable contexts.

Realization as actualization of some potential, that is actualizing a process of making something real. Realistic evaluation recognizes that policy objectives are achieved through a program’s actualization of the potentialities in the situations where intervention takes place.

Realization conceived as accomplishment of some objectives. Realistic evaluation is conducted to improve the accomplishment of policy and program objectives.

In this way, the evaluators can apply an appropriate methodology to construct the necessary data, where its key aspect is the creation of a situation in which the theoretical postulates and conceptual structures under investigation are open for inspection in a way that allows the stakeholder to make an informed and critical contribution to them. The strategy involves a highly specific and carefully planned route march that goes between the quantitative and qualitative methods. On the other hand, planners have the opportunity to elicit and interpret findings of evaluations in realistic terms. Finally, policy makers, through a procedure of mutual understanding between themselves and the evaluators as well as the planners, can thus set the context for evaluation, making clear what evaluation can teach them and what use they make of it.

REFERENCES