COST BENEFIT ANALYSIS - A TOOL TO OPTIMIZE PROJECT CYCLE MANAGEMENT

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ABSTRACT

Developing a sustainable economy requires increasing the competitiveness of public and private activity sectors, in order to attract internal and international financial resources needed to finance the growth of economic entities. Given the limited public resources and diversity of competitive sectors that require funding by public funds, a comprehensive analysis of social costs and social benefits of a project must be achieved, in order to optimize decision-making on carrying out different types of investment projects. In this sense, cost-benefit analysis demonstrates its usefulness by highlighting the social effects of a project, compared with the investment costs, so that social benefits obtained through the project's implementation determine its opportunity and its need. The purpose of this paper is to highlight the importance of using different project management techniques which, correlated, lead to a higher quality of the results and information, allowing the public decision-maker to establish the destinations of resources allocation to those types of investments that meet at a higher degree the national, regional or local socio-economic objectives.

1. Introduction. Context and necessity in using cost – benefit analysis

The development of an investment project (transport infrastructure, waste management system, research center, land improvements, production or distribution of electricity) may cause benefic effects such as local or regional economical development, transport flows optimization, pollution reduction, improving the performance of soil, but it can also have negative effects such as the demolition of properties, displacement of population, decommissioning of land, noise, environmental modification.

For most types of projects, their impact on the environment (natural and anthropogenic, in all its components) causes the creation of an *intrinsic economic value*. Therefore, in order to select the optimal variant of an investment project (from both constructive and operational aspects) it is necessary to accurately estimate the investment's costs and benefits, not only through financial performance, but also through the economic - social one, whose effects are transmitted in the development of the region in which the project is implemented *(Munteanu et al., 2009)*.

Cost-benefit analysis is the main tool used in the economic estimations and evaluations of publicly funded projects. Its objectives are to determine the level of a project's contribution to the economic and social cohesion policy (operational program objectives) and, in particular, to the achievement of the objectives of the priority axis and operation from which the funds are required, as well as to establish if the project needs co-financing in order to be financially viable. Cost-benefit analysis can help the public decision-maker to identify those projects that will maximize the net social benefits, and

thus set the order of priorities for the investments in infrastructure works (and not only), representing an extremely useful tool for the resources allocation decision making.

Therefore, the cost-benefit analysis is an analytical tool used to estimate (in terms of benefits and costs) socio-economic impact due to the implementation of certain actions and / or projects. The impact must be assessed compared to predetermined objectives, the analysis being usually accomplished by taking into account all of the individuals affected directly or indirectly by the action. Cost-benefit analysis estimates and sums the monetary value equivalent of present and future costs and social benefits related to the public investment projects, from the citizens' point of view, in order to decide whether they are in the public interest *(Moşteanu & Iacob, 2008)*. The area which has received the greatest attention in terms of studies on cost-benefit analysis is public transport.

The main purpose of CBA is to help social decisions making, namely to facilitate a more efficient allocation of society's resources. Basically, CBA is a method of evaluating a policy by quantifying in monetary terms the value of all the consequences of this policy to all members of a society *(Broadman et al., 2004).*

The net social benefit expresses the value of this policy. The difference between social benefits (B) and social costs (C) is the net social benefit (NSB):

$$NSB = B - C \qquad (1)$$

Basically, the impact of the projects must be assessed from all points of view: financial, economic, social, environmental, etc. The objective of CBA is to identify and quantify (i.e. give a monetary value) all possible impacts in order to determine the project's costs and benefits, then the results are added (net benefits) and it is concluded if the project is appropriate.

Traditionally, the costs and benefits are evaluated by analyzing the difference between the "with project" scenario and its alternative scenario: the "without project" scenario (so-called "incremental approach"). Furthermore, the results are combined to identify the net benefits and to establish whether the project is timely and deserves to be implemented. Costs and benefits should be assessed on a differential basis, taking into account the difference between the project's scenario and an alternative scenario external to the project. The impact must be assessed against predetermined objectives. By evaluating a project based on microeconomic indicators, CBA can assess the degree of compliance with specific macroeconomic objectives. In the context of the Regional policy, CBA is applied to estimate the importance of an investment project for the European regional policy's objectives.

2. Categories of costs and benefits used

In a cost-benefit analysis the following ***categories of costs*** are considered:

• Direct costs (e.g. the project's cost, the consultancy's cost, the cost of the land, construction costs, technology costs, operating costs, management costs, training, cost of financing, etc.);

• Indirect costs from externalities which in turn can be addressed in terms of:

a) *market price* (decrease in property value, environmental remediation costs, costs of pollution prevention (PC), recycling costs, costs of transmutation or rearrangement of populations, health costs from pollution or hostile environment, cost of replacement (RC) of productivity losses in tourism or agriculture, etc.);

b) *shadow price* (loss of flora and fauna, damage to landscape, the loss of unique natural habitats - Delta, reserves, estuaries, mangroves, etc.).

These types of costs are reported to <u>*benefits*</u> such as:

• Direct benefits grouped into:

a) financial benefits (profit) - Revenue from sales of goods and services;

b) economic benefits (economic, local, regional, national development - especially in infrastructure development projects, saving the resources used in production, brand image and strengthening the position on the internal and external market towards clients and suppliers);

c) social benefits (increase in the number of jobs and social stability which affects the economic and political stability).

• Indirect benefits from externalities grouped into:

a) *market price* (increased property values, health benefits - lower expenses with public health, benefits from education and ecological training, avoiding the costs of pollution prevention, productivity growth of sectors such as: tourism, agriculture, fisheries, economy of costs incurred by lowering the level of green fees);

b) *shadow price* (environmental and eco-system conservation, reducing noise, emissions and effluents pollution, conservation of natural landscape, preserving historical, cultural and recreational sites, increasing the quality of public and private services, etc.).

3. Project life cycle management. Logical framework approach

The life cycle of a project can be defined as the period in which the project is conducted, as follows: marketing, project proposal development, winning the contest of funding, research to achieve the project's thematic, design to achieve the project's thematic, production and achievement of proper project theme, performance evaluation, marketing of the project's results to obtain benefits, re-use of project results (Turner & Simister, 2004).

Project life cycle management is a concrete method for project management that was first used by the World Bank in order to conduct its projects, from the beginning of the 60s of the last century.

Project life cycle management consist of planning, implementation and evaluation of the project, and in motivating the parties involved in order to achieve the expected results, in the timeframe and with the resource consumption limits established (*Daneş & Vârtopeanu, 2003).*

The general (classic) model of such a project comprises four stages:

• *Project definition*: defining the project's specifications, its objectives, establishing the project's team, allocating the main responsibilities;

• *Project planning*: developing project plans, developing content activities, human resource, time and project budget planning;

• *Implementation and control*: project implementation, monitoring the progress in implementation, evaluation, measurement and control of intermediate outputs, making development predictions and forecasts;

• *Completion and delivery stage*: delivery of the project's product to the beneficiary and carrying out training, dissemination, transfer of documents, etc.

The Logical Framework approach (LFA) is a planning and management tool used for development projects. *Logical framework approach can be defined as an analytical process and a set of tools used in planning and project management. It provides a set of interconnected concepts, used as part of a process to support systematic and structured analysis of a project idea or program.*

The logical framework approach is a basic tool used in project cycle management, as follows *(Daneş & Vârtopeanu, 2003)*:

• it is used in the ***identification stage*** of project cycle management, in order to support the existing situation analysis, to investigate the relevance of the proposed project and to identify potential objectives and strategies;

• in the ***stage of formulation***, the logical framework approach supports the appropriateness of preparing a project plan with clear objectives, measurable results, risk management strategy and management levels of responsibility clearly defined;

• during the ***implementation stage*** of the project/program, the logical framework approach provides key management tools for the following activities: contracting, operational planning and monitoring;

• during the ***stage of evaluation and audit***, the logical framework matrix provides an synthetic image of what was planned (objectives, indicators and key assumptions), providing the performance and impact assessment basis.

The built of a logical framework takes two phases, completed progressively during the stages of identification and formulation of Project Cycle:

I. The analysis phase represents the analysis of the "problematic situation" existing at one time (before the implementation of the project or program proposal), as a starting point for building a new improved situation, the 'desired situation' in the future (after the implementation of the project). The project is "a tool" with which the project team makes the "change" from the problematic situation, existing prior to project implementation, to the situation improved, desired, after the project's implementation. Note that a "problematic situation" is analyzed and not "a problem", because the problematic situation is caused by several problems, mainly those that have to be handled throughout the project. It is essential that projects or programs to be designed to address real problems faced by target groups and final beneficiaries, so as to meet their needs and interests.

This phase is also realized in four steps:

I.1 Stakeholder Analysis

The stakeholders are defined as individuals, groups of individuals, institutions, professional organizations, companies, etc. that may have a direct or indirect connection with the project or program. To maximize the social and institutional benefits of the project or program and to minimize the negative impact, in the case of the stakeholder analysis, all those factors which could affect its implementation, either positive or negative, are identified. It is required that the stakeholder's analysis to take place in an early stage, usually in the identification and formulation phases of the project or program.

I.2 Problem Analysis (current problematic situation – current state)

The problem analysis identifies the *negative* aspects of a current problematic situation and determines the 'cause and effect' relationship of actual problems. The analysis involves three steps:

• Define and clear delineation of the analysis (current problematic situation);

• Identify major issues defined as states, difficulties, negative issues facing the target groups, beneficiaries and stakeholders (The answer to the question: which is / are the problem / problems?);

• View problems in graphical form, called "problem tree" or "problem hierarchy ", to establish the 'cause and effect' relationships.

I.3 Analysis of objectives (the prospect of improved situation - future state)

The analysis of the objectives is a method designed to:

1. Describe "the improved situation" (future desired state), as a result of project implementation;
2. Determine the hierarchy of objectives;
3. Graphically illustrate "cause and effect" relationships.

The "negative situation" illustrated by the problems' tree is translated into a "improved situation", by a positive reformulation of the problems identified. For example "reduced agricultural production", a negative situation, is recast as "high agricultural production", as a positive situation. These positive formulations are thus transformed into **objectives**. They are presented into another logical scheme called the **objectives tree**. The objectives tree provides a clear prospect of the improved future situation.

I.4 Analysis of Strategies (comparing the various options to improve the current situation)

The final step of the analysis phase consists in choosing the strategy to be applied to meet the objectives proposed by the project. Choosing the strategy consist in selecting

from the objectives' tree those objectives which will be included in the project (objectives which will be fully or partly achieved as a result of project implementation), other objectives will remain outside the project (objectives which will not be met by the proposed project) and also the main objective – the goal of the project.

This step involves:

• Establish clear criteria for choosing the strategy;

• Identify different possible strategies to meet all or part of the selected objectives for the project;

• Choice of project strategy.

II. The Development/Planning phase, is the one in which the project idea is developed practically, operationally, in order to allow its implementation. At this stage, the Logical Framework Matrix is completed; the activities and resources are formulated and planned.

The stages of building the logical framework can be found in Figure 1:

1. THE ANALYSIS PHASE	2. THE DEVELOPMENT/PLANNING PHASE
STEP I: STAKEHOLDER ANALYSIS Identifies groups, individuals or institutions which will be affected by the project and its development, identifies key problems, constraints and opportunities that may appear due to the project's implementation.	STEP 4: LOGICAL FRAMEWORK Defines the project's elements, tests its logic and formulates objectives in measurable terms.
STEP 2: PROBLEM ANALYSIS Formulating the problem, determining the cause-effect relationships and developing the problems tree.	STEP 5: RISK EVALUATION Identifies the conditions and the events that will affect the project but which are uncontrollable by the project's management.
STEP 3: ANALYSIS OF OBJECTIVES Developing the objectives generated by the identified problems, identifying the objectives' relationships and determining the project's strategy.	STEP 6: INDICATORS Identifies the means to measure the progress, formulates the indicators and ways to measure them.
	STEP 7: ACTIVITIES PLANNING Determines the sequences and the dependency between activities, estimates the duration and establishes the responsibilities.
	STEP 8: COSTS PLANNING Specifies and prepares the budget.

Figure 1 The phases of the Logical Framework Approach

4. Linking CBA with project cycle management and logical framework approach

The logic of the CBA correlation with project cycle stages, i.e. logical framework approach, starts with the two main types of cost-benefit analysis: ***CBA ex ante*** and ***CBA ex post***.

The overlap of the two types of CBA with the project life cycle is reflected schematically in Figure 2.

I. The identification / definition of project stage

Starting any type of pre-investment project involves identifying a need in the relevant field.

In this respect, ***CBA ex ante*** is performed during the period in which a project is still in study, before its implementation, therefore its contribution to decision making is direct, immediate and specific. This is due to the fact that the analysis is performed during the period in which it must be decided whether the scarce public resources should be allocated by public institutions for a certain type of project.

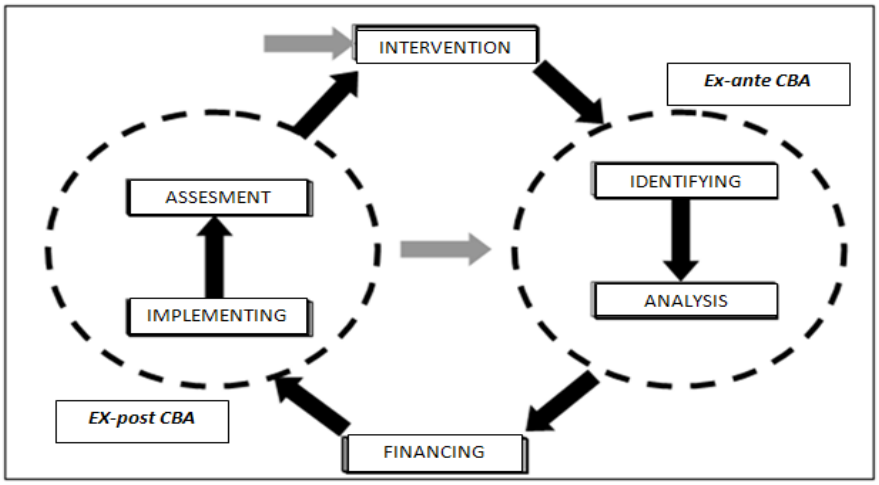

Figure 2 The link between CBA and the project life cycle

The starting point in the development and implementation of a CBA is ***setting goals.***

The CBA's goals need to be established clearly, unambiguously. They should have a target group, problem / condition, and the nature of change expected from the changes due to the project's implementation.

Basically, CBA introduces in the project's phase of defining / identifying **social objectives** of the project, identifying the target group to be affected directly from the project's results. Therefore, the socio-economic variables which the project might affect are taken into account.

Next follows ***the project alternatives' debate***, mainly choosing between a public and a private project, or between several different projects as mission, purpose, location and size. If the public projects will not be chosen, it means that it is more appropriate to keep the resources within the private sector.

A critique of CBA is obtained on the intricate patterns applied, most often the least desirable alternatives. Since the purpose of CBA is to make efficient use of social resources, it should include all realistic alternatives. For public projects, subject to budgetary constraints, it is recommended that also the alternatives be subject to the same constraints.

Here comes the logical framework approach, mainly the information provided by the stakeholder analysis, problem analysis or current stage, analysis of objectives and analysis strategies or paths to follow.

Correlating the results of carrying out these analysis with an earlier stage of CBA, it can be emphasized the methodologies' usefulness to substantiate the relevance of the proposed project and formulating the desired objectives.

II. Analysis / project planning stage

If at this stage the logical framework supports the preparation of a suitable plan of the project by developing the Logical framework matrix, CBA provides information on the financial sustainability *(financial analysis)*, but most importantly, on the socio-economic viability and impact of the investment project (*economic analysis).*

Starting from the issues mentioned above, ex ante CBA proves its usefulness in approaching a project in socio-economic terms, inserting in the project cycle stages elements of the nature of social objectives, thereby helping to assess the effectiveness of the investment project in terms of social benefits for the interested groups.

The results obtained from achieving the financial analysis, economic analysis and risk and sensitivity analysis regain their usefulness in the **project financing** decision making.

III. The implementation / execution of project stage

Once the project was accepted for funding, implementation or completion time is next, with conducting the activities set out in the early stages.

The role of the logical framework approach at this time is to provide key management tools for contracting, operational planning and monitoring, supplemented by ex post CBA.

Ex post CBA is done at the end of the project, the analysis is more comprehensive but less direct, because it helps the process of educating decision makers on whether which categories of projects are needed.

This type of analysis is also complementary to the **assessment stage (5)**, providing information and further guidance on the impact of the project actually achieved compared with its overall objectives and purpose.

The transparency and the structure provided by the use of CBA and the logical framework during the project's design, keeping open the basis for planned action and the logic behind the definition of the project (logical sequences between different levels of intervention and the role of external factors) facilitates considerably the implementing and evaluating stage of a project.

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