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The economic evaluations and the real estate appraisals for the effectiveness, feasibility and sustainability of urban regeneration measuresFrancesco Calabrò ^{a*}, Lucia Della Spina ^a^a *Mediterranea University of Reggio Calabria, Italy***Abstract**

The urban policies and territories live a period of profound transformation, characterized by a shift to new approaches and governance tools. The programmed public action generates an application for assessment: facing the loss of representation of the political and the increasing complexity of the variables that influence public choices, decision-makers have the absolute need for auxiliary tools to help optimize the use of resources and, at the same time, to make the decisional path shareable and transparent. The always fewer resources available, the importance of the time during transformation processes, the rational legitimacy of choices are some of the difficult issues to solve that lead to the need to experiment with new tools to support decision makers, from the early stage of planning or in the pre-design phase (Saaty, 1990; 2008).

In this valuation context of compatible functional solutions, the Multiple-Criteria Decision Making (MCDM) methodologies (Roy & Bouyssou, 1993), and the Analytic Hierarchy Process (AHP) in particular, play a significant role as they enable all the intrinsic values of the assets in question to be taken into account, both economic and extra-economic. The use of these methods can provide choices that are not always based on the best cost-benefit ratio (Nesticò, Macchiaroli, & Pipolo, 2015).

In addition to guaranteeing the presence and the clarification of different values, the formalisation of an evaluation process carried out in these terms and the expression of the community needs also allow for the control and the correspondence between general and specific choices to take place. Since the asset is of a particular value, it is, however, necessary that the various criteria and weights taken on the basis of the evaluation be shared by the community or rather by direct users and by potential or future users.

Keywords: Economic Evaluation; Multi-Criteria Decision Making; Strategic Planning;

1. Introduction

How correctly it is highlighted in the project of KIWiS 2016: *“The economic crisis and (consequently) social that hit most European cities, is having effects on transformation and urban regeneration processes. More and more often we see cases of “large” projects abandoned, deferred or lapsed, either by difficulties encountered by operators, for the exponential delay in approval times or realization or, as in most of the recent cases, for the coming up of unsustainability costs of realization. On the basis of recent experience it appears that today this approach to urban planning, characterized by great works, long lead times and high costs, it is questioned and it appears, also, in crisis.*

Urban regeneration is an emergency but requires more measured, rapid and widespread interventions and with low investment: recoveries, demolition and reconstruction, creation of public spaces. No more time for large projects projected over the long term and in need of substantial capital, it's necessary to improve the quality of urban life with small actions, fast and flexible, low cost and low or no impact, in the places of everyday life; in the spaces of real life.”

If all this is true, and we think it is, then there is a clear need for aid in promoting a holistic approach to urban regeneration, in which the culture of evaluation, in particular economic and estimate, plays the usual role of auxiliary tools to decisions: learning to decide, by building a path of continuous references between rationality and invention.

2. The economic evaluations and the real estate appraisals for the effectiveness, feasibility and sustainability of urban regeneration measures

In other words, really changing the reality around us to make it more fitting to our needs implies a decision-making process as a synthesis of formal solutions and their possible implications, in terms of: capacity to satisfy the needs for which they were designed; resource requirements for their realization; and diachronic implications in terms of management and maintenance.

The decision-making process that results from the recognition of a need to its satisfaction through a production process does not have a rectilinear course, in which each successive pass is a necessary and an unambiguous consequence of the previous steps.

It is, rather, a directed branched system representable by a directed graph, where each node is connected to another downstream of an evaluation process, implicit or explicit.

Decisions pertaining to the rethinking of urban spaces cannot be taken only through a process aimed at identifying the formal solutions most consistent with the world view of the designer, at the most correct with the technological implications necessary for its technical feasibility.

The absence of control of estimative implications, under construction and management phases, is one of the main causes of the proliferation of unfinished or unused works.

Another aspect that appears to be significant is the legitimacy of decisions: why was a project chosen over another? Why was a given solution adopted?

The total de-legitimization of the political class, as well as the loss of sure cultural references produced by the collapse of ideologies, makes it difficult to build consensus around the decisions of local public officials.

To make explicit the objectives that a decision-making process intends to pursue and the criteria adopted to choose among the conceivable alternatives at least make clear the way in which it has reached a certain choice and, at the same way, make it possible to modify and to improve the choice through a rational path.

If all this is true for the individual public project, it is even truer in the context of a more intensive program of activities, as an urban renewal program of significant parts of the city.

In this case, on the considerations set out above, which retain their validity, additional levels of complexity add themselves to the decision making process, dictated by the need to take into account the presence of several actors, public and private, with the municipal administration that takes for direction, coordination and control.

How does it enable to contribute to meeting the needs of the community to entities different of the local authority? How does it create conditions for private convenience? How does it make the collective conveniences contemporary with private ones possible?

Again, the culture of evaluation can support decision making through estimating the impacts that can be generated from alternative hypotheses, verifying the persistence of convenience conditions for all parties, and ensuring the sustainability of the interventions.

And even more complex becomes the decision making process at the time when the system of identity resources is involved, where the expression of a judgment of convenience is entirely outside the logic of the market, but there remains a need to ensure, through appropriate management models: the sustainability of the interventions, in a historical period in which it is no longer possible to think about the use of public resources for the management.

3. Economic evaluation of projects and public spending contraction

Historically, the cost-benefit analysis, from the earliest experiences of the 30s of the last century made in the United States and then gradually to all subsequent ones, was aimed to demonstrate that the benefits to a community, deriving from a particular work, outweighed the costs it had incurred.

This test was sufficient by itself to finance the work, in a political-economic context which considered the public debt a useful tool to increase the collective welfare; it was still far from being the problem that severely affects the contemporary public policies in the Western world. In fact, it was operating as if there was an ideal position with unlimited resources.

The gradual decline in public spending has changed the paradigm of reference for the economic evaluation of projects: the decision-makers are having to give answers to needs that are always unlimited, but with fewer resources always available.

It is in this context, and also for other reasons omitted for brevity here, that for the use of public resources for urban and territorial transformations, new tools as Complex Urban Programs and Strategic Plans are designed.

The results of these new tools are not yet satisfactory but they make sense of their potential, thus stimulating the research for the necessary correction for their effective application.

In particular, the culture of evaluation can and should make a significant contribution to the improvement of these tools: it is clear, however, that paradigm shifts mentioned above also determine the need for a radical change in the assessment tools used.

4. The evaluation of strategic plans and operational programs

4.1 The phases of the transformation process and the evaluation questions

In those circumstances, the question that more and more often today the evaluator must answer is: placing a picture of needs almost unlimited and one limited stock of resources, what is the optimal use of these resources?

In fact, the question itself is not unique, but it changes depending on several factors:

- The nature of the subject that raises the question, namely whether it is a public or private entity;
- In the case of a public entity, the phases of the transformation process are as follows:

Phase 1 - Strategic Planning / Operational Programming

Phase 2 - Design

Phase 3 - Execution

Phase 4 - Management

Phase 5 - Disposal / Regeneration

In general, the evaluation, to any level of detail, can reduce the risk of error but not eliminate it; it is evident that more reliable is the system of the information on which the feedback is based and lower is the risk of error, which is an inverse function of the quantity and quality of information available. These considerations show that the risk of error decreases by doing the decision making process towards more advanced stages, in which the information available is more and with more reliability.

In the first phase of the transformation process, as part of the strategic / operational planning, evaluation plays a decision supporting role for the selection of actions to be included in the Plans / Programs.

This phase is characterized by the scarcity of the information available, given the level of depth of the actions, therefore by the need to decide in highly uncertain conditions.

The evaluative question may concern:

- selection of priority interventions / actions to be included in the plan / program: in this case, some interventions / actions among many hypothesized must be selected;
- the feasibility of a single work: in this case, it is necessary to select a solution from two or more alternatives.

4.2 The selection of priority interventions / actions to be included in the Plans / Programs

These data are constant, which characterize all situations of planning: it is the shortage of resources compared to the needs to be met.

The process of planning / programming, in turn, can be considered in three phases:

- **Cognitive phase**, in which the analysis of the context affected by the Plan / Program is carried out, of the critical issues to be addressed, of the resources to be enhancing;
- **Decision making phase**, in which the strategy is defined, the priorities are set, and the actions that will be part of the Plan / Program are selected;
- **Descriptive phase**, which is explained in detail the Strategic Plan / Operational Programme, includes- in relation to the time schedule according to which it will be implemented- its related modalities, the actors involved, the sources of financing , and so on.

The actions are the means by which to achieve the results. They must be, therefore, clearly connected to the results to be achieved (expected results): certainly, more actions (i.e. different actions) could be provided for a single expected result.

In the Program Theory, the expected results representing the program's objectives and actions are the tools, what you think you can do to achieve (or to help to achieve) those results.

Actions can be simple or complex. Thinking carefully and in detail of the actions in the planning phase helps to gain time in the later phases.

The actions to be put in place must therefore be defined as detailed as possible: the predominant way, which, not only in Italy, is often used to program, has certainly helped to make the programming choices totally dark, so not understandable and not verifiable.

The selection of actions that constitute a Plan / Programme happens on the basis of an evaluation process, in turn divided into steps that take into account:

Step 1 - the consistency of actions against objectives;

Step 2 - the capability of actions to satisfy the needs, i.e. their effectiveness;

Step 3 - their feasibility and sustainability;

Step 4 - distributive equity, compared to the territories and / or to the bodies involved;

Step 5 - the priority given to the aims pursued by the actions, i.e. the relevance of the actions;

Step 6 - the availability of resources (budgeting).

Step 1 - the consistency of actions against objectives

In this phase, an extensive list of possible actions is drawn up: it is based on the information coming from the analysis of the context and of the objectives identified to implement the strategy.

Step 2 - the capability of actions to satisfy the needs, i.e. their effectiveness

In this phase, the results obtained from the individual actions are estimated; due to the scarcity of available information, the estimate is based on the opinions of experts and / or in comparison with similar experiences in similar contexts.

Step 3 - the feasibility and the sustainability of actions

In such an evaluation process, the exam of the feasibility of the actions is above all technical and legal-administrative aspects; the economic aspects, in addition to the estimate of the initial investment, are verified, especially in terms of sustainability in the management phase.

Step 4 - distributive equity

Apart from a few authors (Mollica, 1966, for example), this aspect of the decision-making process is too often omitted, almost as if it involves illegal activities. It appears instead entirely lawful that an entity, especially if is public or bearer of popular and not individual interests, is partners of a program as it proves to be a useful tool to meet the needs of the territory or of the category it represents. It is clear that beyond automatic mechanisms (resources allocated in proportion to the population, for example) on the decision-making process, other factors also affect; even of objective nature or easily sharable by decision makers, such as the relevance of the resources or the problems of a certain portion of territory, rather than the relationship with other previous or parallel plans / programs. The decision-making process, in real life, is also influenced by other aspects, less "technical", such as the authoritativeness and prestige of the political representatives. The aim of assessment is certainly to take into account equitable distribution requirements on the basis of objective mechanisms: corrections, which to some extent also take account of the political, adhere to the sphere of decision-makers.

Step 5 - the priority of the aims

The initial analysis of the context, of its resources and of the critical issues to deal with, provides the information that lead to defining the strategy of the program and its hierarchized objectives. Once the effectiveness of actions is measured, their feasibility and sustainability are verified, the distribution criteria is set, the selection of the actions is based on the priorities assigned to the objectives being pursued through the actions. This activity allows us to draw up a sort of a final list of actions to be taken, possibly structured by intervention sector.

Step 6 - the availability of resources (budgeting)

One of the primary differences between a plan and a program is that a plan, especially if strategic in nature, does not usually have a pre-set budget: in this case there is no budgeting phase; the actions will be funded in successive phases, as they present opportunities arising from calls or by the partners' own resources. In the case of programs, however, in relation to the budget hypothesized, the actions are included in the program according to the ranking made in the previous phase.

5. MCDM and the Analytic Hierarchy Process

Generally, the decision problems are governed by a number of decision makers, each with his or her own objectives and priorities; the impacts of these targets are necessarily expressed in different units.

It is, therefore, one of the decision-making problems: multi-decision makers, multi-objective and multidimensional, in which the available information is represented by a matrix of mixed data, with quantitative and qualitative values.

All evaluation problems are analysed by identifying and entering in the decision-making model (Fig. 1), the following elements:

- a GOAL which is the general objective to be achieved;
- a DECISION MAKER or a group of decision makers who express their preferences;
- EVALUATION CRITERIA the basis of which is that the alternatives are evaluated;
- the ALTERNATIVE representing the object of the assessment that must be ordered;
- SCORES expressing the value of the alternative compared to a criterion.



Fig. 1. Elements of a decision-making model

Any decision problem to be solved makes use of decision support, i.e. evaluation techniques.

More recently have we developed decision support techniques, such as multi-criteria analysis and multiobiettivio, where it is not required to use a single unit of measurement, but it is rather possible to compare quantitative and qualitative data.

One of the main implications of multi-criteria approach was the renunciation of optimality paradigm in the new analysis techniques, with the presence of heterogeneous objectives, often in conflict with each other; it is usually not possible to find solutions that simultaneously pursue all objectives, and the decision problem is solved looking for the most satisfactory solution, or better "more coherent" with the logic of the decision makers.

The choice must therefore be effected within the set of non-dominated solutions, those solutions that realize a certain level of achievement of the various objectives such that it is not possible to improve the level of one of them without causing a worsening of the level of at least one another objective.

A multiobiettivi decision problem is thus solved by transforming it into a series of mono-objective optimization problems, in which one of the objectives is chosen as a function to be optimized in respect of target on the level of achievement of the other objectives

In this valuation context, the Multiple-Criteria Decision Making (MCDM) methodologies (Roy & Bouyssou, 1993), and the Analytic Hierarchy Process (AHP) in particular, play a significant role as they allow all the intrinsic values of the assets in question to be taken into account, both economic and extra-economic. The use of these methods can provide choices that are not always based on the best cost-benefit ratio but, for example, which optimizes the quality of conservation or that safeguards the intrinsic value of the asset (Nesticò, Macchiaroli, & Pipolo, 2015). As well as guaranteeing the presence and the clarification of different values, the formalisation of an evaluation process carried out in these terms, expression of the community needs, also allows the control and the correspondence between

general and specific choices. Since the asset is of a particular value, it is, however, necessary that the various criteria and weights taken on the basis of the evaluation be shared by the community or rather, by direct users and by potential or future users.

The Analytic Hierarchy Process (AHP), among various MCDM, provides a hierarchical analytical method that has found many applications in evaluation of priority and pre-feasibility of different projects. As help techniques to the decision making, the AHP has been, up till now, applied to an extensive variety of decision problems, such as the selection of projects, planning public resources such as energy and medical resources and, more generally, conflict analysis and strategic planning (Calabrò & Della Spina, 2014a). Specifically, the AHP, developed by Saaty, is used to achieve preference scales on the basis of the comparison pairwise technique between the elements that make up the decision problem in relation to a defined objective (Saaty, 1980). Users of the AHP first break down the decision problem into elementary parts and subsequently compare each pair of data in order to develop a priorities scale among the alternatives at each level of the decomposition.

Effective help to the study and support to the decision of those issues are offered through the multi-criteria analysis group (Figueira, Greco, & Ehrgott, 2005). Among them is the AHP methodology, used as a tool that can provide an integrated approach to the issue of sustainability assessments.

The hierarchical scheme, illustrated in Figure 2, is organized on two levels of criteria: the first, through the use of artistic, economic, social and cultural indicators, tries to define the priority matrix in three different scenarios whilst the second level of criteria, through characteristic elements of the problem, addresses the construction of "appreciation matrices" of the criterion in relation to the four alternatives.

The assumptions and criteria used in the evaluation process, represent the synthesis of a comparison to make with Delphi-type procedures, through the interaction of a panel of selected and independent individuals, (experts, privileged witnesses, etc.). They anonymously interacted and actively debated the complex problem, thus creating an independent communication process (Okoli & Pawlowski, 2004). The communication among participants in the panel allows each expert to express their knowledge, perspective and opinion on the evaluation issue and reconsider, after feedback, the opinion expressed by others.

The aspects of the overall value of the property are thus identified: the fundamental coordinates against which to assess the possible works of transformation and reusing of the asset.

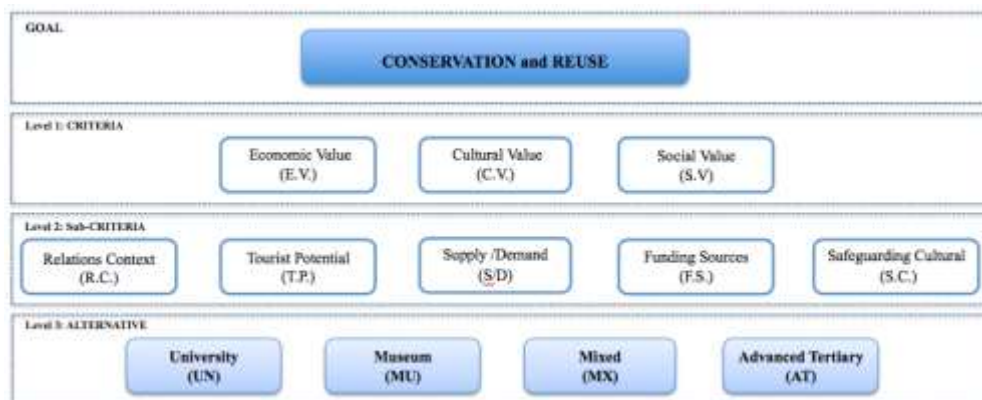


Fig 2. Hierarchical decisional scheme: Objective - Criteria - Sub-criteria – Alternatives

The Economic Value (E.V.) is expressed by the monetary benefits resulting from the asset, or rather the benefits it should return (in terms of opportunity cost) (Calabrò & Della Spina, 2014b).

The Cultural Value (C.V.) represents the "intrinsic value" of the asset, namely the incommensurable or qualitative values. It is expressed with the use of Multi-Criteria analysis.

The Social Value (S.V.) is expressed in order to gather all the benefits originated, in time and space, by the conservation using the division among the different types of users. The Social Value as an expression of the needs of the present, potential and future community also reflects those "post-materialistic" needs that manifest the need to conserve and protect its cultural and historical heritage.

These three aspects (criteria) represent the fundamental coordinates with respect to that which must be placed on the issue of evaluation of a resource and, above all, the evaluation of possible projects for transforming it. In addition, they define the "complex social value" of the resource, as a whole of all the benefits (economic, cultural and social) that can be achieved over time from the asset by all users (direct, indirect, potential and future).

6. Conclusions

The multi-criteria methodologies have proven particularly useful in the process of urban regeneration and local development. It is an instrument of mediation among the multiple and often divergent interests and is able to create a shared platform among all decision-makers, stakeholders and people directly affected by the final solutions. The use of different techniques of MCDM in the preliminary stages will support public administration in complex decision-making problems, ensuring an integrated, multidisciplinary and transparency to the whole evaluation process. It has emerged that these tools are extremely strategic, especially if adopted early in the planning stage or the pre-feasibility, playing a role of control and management (Cassalia, 2014). It can support the public body in the choice among different policy options, through negotiation among the various stakeholders for a more transparent and efficient identification of shared and sustainable choices (Guarini & Battisti, 2014b; Della Spina, et al., 2015). Thinking in terms of sustainability, the MCDM plays an important role in the path towards sustainability. To consider the development for sustainability means considering the multiple dimensions involved in the development and planning of the urban transformation (D'Alpaos, 2012), considering the development as the result on the short and long terms, interconnected social, economic, and environmental objectives (Calabrò & Della Spina, 2013). For this purpose, the MCDM and in particular the AHP lends itself as a tool capable of dealing with this multidimensionality in an integrated way and reflects the complex interdependencies among the different dimensions of the transformation and reuse of the asset. The high transparency of the AHP steps and simple hierarchical representation of the various evaluation stages are the widespread application of this multi-criteria technique and its intrinsic effectiveness in identifying shared choices. The use of the hierarchical diagram, the matrix of the criteria and the matrices of the alternatives being input, and the vectors of preferences for the different scenarios in the output stage characterise the multi-criteria technique of operational simplicity and clarity of the mathematical process, making it logical for everyone involved.

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