
Public interest evaluation in negotiated public-private partnership

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Abstract: ‘Public interest’ has always been a necessary and unavoidable condition in Public-Private Partnership negotiated-type (PPPN), introduced in the Italian law in 1992. However, only in 2014 that the meaning of public interest has been clarified through art. 17.1 letter g) of Law no. 164/2014, by matching it with an extraordinary contribute of urbanisation. In this law the extraordinary contribution is defined by taking into account only the purely financial criteria. Instead, European Directives and case law reaffirmed the multi-dimensional connotation of public interest. The aim of this work is the construction of an evaluation multi-criteria procedure enabling a municipality to evaluate the public interest of a PPPN initiative, by considering heterogeneous financial, procedural, socio-economic, environmental, technical components. The procedure is applicable in the European context where PPPN shall apply; to test its operational capacity it will be applied to a case study: the Integrated Action Programme in Mentana (RM).

Keywords: appraisal; multi-criteria decision analysis; MCDA cost volume profit analysis; CVPA; public-private partnership; stakeholders analysis; public interest.

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1 Introduction

In Italy, from the early 90s of the 20th century, it was introduced, through the legislation referred to the so-called complex programs¹, the opportunity, for private physical-and-legal persons of submit to the Municipalities (MU) proposals for regeneration and settlement development, after concertation with the MU about their content (negotiated public-private partnership, hereinafter PPPN), even with variation compared to the expected provisions of the general urban plan (GUP)².

In contexts always more characterised by scarcity of public resources, the individuals who have financial resources to (co)finance the settlement transformation interventions, with the PPPN are working to achieve goals related to the enterprise profit and to the MU.

The recognition of a public interest in the proposed initiative (of PPPN) has always been necessary and unavoidable condition for the use of private-nature proposals in the land planning and programming tools.

However, only after more than 20 years since the introduction of PPPN (1992–2014) it has been applied in legislation the meaning of public interest, through the art. 17, subparagraph 1, letter g of Law no. 164/2014.

This article provides for the inclusion, in the Article 16, subparagraph 4, of Presidential Decree n. 380/2001 (the consolidated law on construction) of letter d-ter³: in case of planning variants, in addition to the primary and secondary infrastructure costs a further additional burden – extraordinary contribution that certifies the public interest – equal, at least, to the 50% of the higher value generated by interventions on areas or properties subject to planning variants, is due.

The article has transposed, at a national level, the institution of the extraordinary contribution, already existing in the praxis of some MU⁴; it is to be determined in relation to the added value generated by an intervention of settlement transformation, in case of increase in the value of properties/areas due to urban variations, derogations, changes of the intended use charged to the private entity proposer of the initiative, recognising it as element closely interconnected with the public interest. The regulation does not indicate which are the factors to consider in evaluating the extraordinary contribution, and, consequently, neither which appraisal technique could be adopted in the determination of its value. Most of the MU applied the praxis of using the analytical method of estimating the value of transformation⁵. The transformation value (VT) is conceptually similar to hope value as defined by the European Central Bank (2014)⁶. To date (2016) by applying this methodology, the MU have then determined the extraordinary contribution taking into account just a financial connotation. Instead, it must be kept in mind that, already several times, it was emphasised the multi-dimensional connotation of public interest:

- At European level: EU directive no. 24 of 2014 (section 88–101) affirms that, also with reference to PPP, in the evaluation of proposals related to the realisation of public interest works, it is appropriate to consider various and heterogeneous judging criteria (financial, environmental and socio-economic).
- In Italy: some judgments of state council (no. 662/2012, 616/2014, 2761/2015 IV section) have shown, in a nutshell, as the public interest ‘does not have its own unique connotation’ (financial/monetary), but it must be recognised as ‘objectively

complex concept’ and it is the ‘fruit of a balancing of all interests, private and public, which balance each other in the proceedings’.

In this context, it seems appropriate to understand when an initiative pertaining the PPPN is or not of public interest, taking into account not only financial criteria but also ones of other kinds (procedural, socio-economic, environmental, technical); for this purpose it is necessary to use methods and techniques of evaluation aimed at assessing the public interest more articulately than the current practice.

In the international arena, to evaluate transformation and settlement development initiatives, is common to use different techniques that allow to express rating about the convenience, even between different alternative solutions (Nesticò et al., 2015), of:

- Financial (AF) and/or economic (AE) nature:
 - 1 The VT, which allows to estimate the value of the property in relation to the real possibility of being transformed; this information, compared with the current market value (VM) (without providing for the transformation), allows the formulation of rating of financial feasibility (about the transformation).
 - 2 Cost volume profit analysis (CVPA) that allows to assess the main financial data of an initiative in relation to its physical and dimensional characteristics (Morano, 2007).
 - 3 Costs-revenues analysis (CRA) which allows to add up all the active and passive financial items relating to an investment project, which occur over time, making the values of annual cash flows, through their actuality discount, homogeneous and comparable.
 - 4 Cost-benefit analysis (CBA) which allows, in investment projects, to measure, compare and add up, in terms of market prices and account, the costs and benefits, over time, directly and indirectly connected to it, attributing them a monetary value in order to achieve synthetic economic indicators by which to assess the same investment projects.
- Multi-criteria and multi-dimensional nature:
 - 1 Techniques of multi-criteria decision analysis (MCDA) that allow to evaluate one or more alternatives considering the various and diverse aspects that characterise them (De Mare et al., 2015). Within such techniques can be also be implemented the results arising from the application of the.
 - 2 So-called techniques to encourage participation (TP) (Guarini and Battisti, 2014), aimed to the inclusion of subjects (stakeholders) in a decision making process, taking into account the different points of view of stakeholders, both public and private, involved in PPPN.

The evaluation of the public interest in PPPN is relevant in the consideration that, despite the crisis in the construction and property sector that has affected several European reality and particularly Italy, the PPPN may still be for MU, an opportunity for development, competitiveness and physical regeneration and territorial infrastructuring, for the reduction in using public resources. It also in consideration of the significant financial liquidity still present in Europe in the ‘private sector’ and despite the current period of global economic difficulties (AA.VV., 2016).

2 Aims and structure of the present work

The aim of this work is to provide a procedure allowing a MU to assess the public interest of a PPPN initiative considering:

- the main elements (financial, socio-economic and environmental but also procedural and technical) that characterise the proposal/s for PPPN (multi-dimensionality of the evaluation, to be assessed through MCDA)
- within the financial aspects – which determine the quantification of the extraordinary contribution – a fair distribution of the higher value generated by the intervention/s, between public and private, in accordance with the art. 16, subparagraph 4, letter d-ter) of Presidential Decree n. 380/2001 (financial deepening, feasible through AF);
- the opportunity to develop a shared and inclusive decision-making process through the involvement of a significant number of stakeholders potentially interested in PPPN, (inclusiveness of the evaluation, through use of TP).

The assessment procedure can be seen as an instrument to assess the public interest in a PPPN activated on the basis of the Italian regulatory framework; however, its multi-criteria structure is flexible and can find wider use in the assessment of PPP' public and private interest in settlement transformation initiatives within regulatory framework from other European Countries. The procedure actually uses criteria listed by the European Commission; in this case must be appropriately verified sub-criteria and evaluation indicators related to the object of evaluation (see. par. 4.1).

Hereafter, 'analysis of the evaluation techniques used in settlement transformation processes' is going to deal with the main AF and AE, MCDA and TP techniques and their distinctive features (par. 3) in order to demonstrate how it is reached 'the choice of evaluation techniques to be integrated in the procedure evaluative' (par. 4). Then will be explained the 'structure of the evaluation procedure' of public interest, a proposal which foresees the joint use of the identified techniques (par. 5); the operative skill of the evaluation procedure will be tested through 'application of the assessment model to a case study: the urban transformation of an area in Santa Croce neighbourhood in Mentana (RM)' (par. 6). The 'conclusions' will summarise the results obtained with the present work (par. 7).

3 Analysis of the evaluation techniques used in settlement transformation processes

3.1 Financial and economic analysis

All the financial and economic analysis techniques provide the collection (or/and, eventually, the estimation) of the main economic-financial data related to the initiative under evaluation (costs, revenues, discount rate, industrial profitability, duration of the intervention in AF and AE, accounting prices in AE) which, reworked, allow to report the economic-financial according to a monetary policy. In particular, the AF techniques (VT, CVPA, CRA), differ in relation to the detail, to the aggregation methods of such data, as well as to the temporality/a-temporality of the analysis.

The VT allows to estimate the most probable value of a property at the time of evaluation in relation to the concrete possibilities (urban, of restraining, environmental, technical, physical) of transformation, through:

$$VT = \frac{VM(pt) - \sum Kp}{(1 + r')^n}$$

where:

$Vm(pt)$ is the VM of the asset realised on the area

$\sum Kp$ is the sum of all the production costs (cost of construction, cost of utilities, technical expenses, general and administrative expenses, concession fees, finance charges, promoter profits, other expenses necessary to build the building)

r' is the specific return rate for the work

n is the number of years required to complete work.

This analysis, a-temporal, allows the formulation of judgments of financial feasibility on the transformation that occurs if $VT > VM$.

If, among the processing costs, the ordinary profits of the property developer was considered, the difference in value, expressed in monetary terms, represents the extra-profit obtainable from the transformation.

The CVPA, when developed for the purpose of evaluating proposals for settlement transformation (Morano, 2007) binds with simple analytical connections the main financial and dimensional variables of the intervention, highlighting their interrelations and facilitating their calibration, thereby allowing to analyse in a targeted manner the effect provoked, over the success of the intervention, by the composition of the financial structure of the project costs in relation to revenues obtainable. The implementation of the CVPA first involves the evaluation of costs of the initiative, distinguishing them into fixed⁷ and variable⁸, and (the evaluation) of revenues. It subsequently provides the processing of the data collected to determine the breakeven point, the contribution and extra-profits margin and the operating leverage of the initiative (Table 1).

Table 1 CVPA

<i>Indicators</i>	<i>Equation</i>	<i>Legend</i>
Break-even point (q^*)	$q^* = Cf/Pu - Cvu$	$Cf = fixed costs$
Break-even index (Ibe)	$Ibe = q^*/ST$ (o SF)	$Cv = variable costs$
Total contribution margin (Mct)	$Mct = (Pu - Cvu)q$	$Cvu = unit variable costs$
Extra-profit	$Ep = Mct - Cf$	$Pu = unit prices$
Operating leverage coefficient	$Clo = Mct/Ep$	$q = quantity$

The break-even point of the initiative, known the technical and financial characteristics of the intervention (costs and revenues scenario) allows to detect the amount of building product to realise and sell in order to bring the financial statements of the transformation in balance (Morano and Tajani, 2017).

The total contribution margin is the financial amount available to pay fixed costs and non-profit initiative (which occur only if the program building potential is higher than those estimated through the breakeven point). As a result, it is possible to estimate the extra-profits of the initiative, corresponding to the plus-value of the settlement transformation operation. By estimating the excess profits/surplus financial value of the initiative, it is possible to evaluate any division between the private developer and MU.

By using the operating leverage coefficient, the stability of the initiative of PPPN can be tested, with regard to the effect that the financial structure of the transaction costs will have on the stability of its financial results in case of oscillations, positive or negative, caused by changes in market conditions and it represents the relationship between extra-profits and fixed real estate transaction costs.

The CRA enables to evaluate, at time zero (when the evaluation is made), the results of the manufacturing process (point of view of the subject owner/manager) in financial terms, expressed through specific performance criteria; It consists of the following stages:

- 1 Evaluation of all the costs and revenues of the manufacturing process, estimated in detail.
- 2 Creation of cash-flow (reported to the duration of the manufacturing process) with calculation of the discount rate. Once costs and revenues of the manufacturing process are estimated, these must be articulated throughout the temporal duration of the initiative. This makes it possible, for each year in which the initiative is ongoing, estimate the financial balance which may then be brought back to current events through an appropriate discount rate.
- 3 Calculation of financial performance indicators: net present value (NPV); internal rate of return (IRR) on the basis of which to take decisions regarding the advisability of intervention/s proposed.

NPV is given by:

$$NPV = \sum_{t=0}^n \frac{CF_t}{(1+i)^t}$$

where:

t deadlines

CF_t financial flow (positive or negative) at time t

i Weighted average cost of capital; alternative performance index for similar risk according to the theory of capital asset pricing model (CAPM).

The IRR is defined as the discount rate that makes the NPV of a series of cash flows equal to zero, if this rate i exists in the interval $(-1; +\infty)$ and that it is unique:

$$0 = \sum_{t=0}^n \frac{CF_t}{(1+i)^t}$$

The CBA, which allows to predict the effects of a project/program/investment, not only from the point of view of the subject owner/manager, but also of the community, is structured in two stages:

- 1 financial analysis (substantially similar to that described for a CRA)
- 2 economic analysis, in which, starting from the data considered to calculate the intervention financial return it proceeds to: fiscal corrections; conversion from market to shadow prices; evaluation of non-market impacts and correction for externalities (European Commission, 2014).

Thus, in analogy to the CRA, by using an appropriate discount rate, it is possible to calculate the performance of the project using, as indicators, the economic NPV and IRR.

3.2 *Multi-criteria decision analysis*

The MCDA techniques allow to make assessments considering both quantitative and qualitative criteria/sub-criteria (Roy, 2013). Moreover they can also be considered the different points of view (of the stakeholders), thanks to the possibility of being integrated with TP. With the MCDA techniques it is possible, among several alternatives (hypotheses of intervention, initiatives, programs, projects), and after allocation to each alternative of a synthetic score (appraisal score), proceeding with their ordering, identifying the preferred one, compared to the objectives set by the decision makers (Nijikamp et al., 1990).

According to the literature on MCDA (Korhonen et al., 1992; European Commission, 2006; Ishizaka and Nemery, 2013), in decision-making processes wherein it is resort to assessment tools pertaining to MCDA, it must be selected, in the framework of models developed over time (among the most significant: WSM, AHP, ELECTRE, EVAMIX, TOPSIS⁹, MACBETH), the most appropriate one, in relation to the characteristics of the evaluation which need to be implemented (Figueira et al., 2005).

The MCDA models may be divided into two categories:

- 1 multi attribute utility and value theories (AHP, MACBETH) where it is applied the method ‘synthesising criterion’ which allows to obtain an alternatives ranking depending on a single indicator able to synthesise the other criteria with in respect of which each alternative is evaluated
- 2 outranking methods: (ELECTRE, EVAMIX, TOPSIS, WSM), where it is applied the ‘synthesising preference relational system’ method which allows to obtain a ranking of the alternatives through the construction of binary relations among these.

Even in the light of this categorisation, the different techniques have a similar structural articulation made by phases successive and preparatory to each other (Table 2); the differences depend on the different logical-mathematical procedures used for the treatment and the processing of data (Hwang and Yoon, 1981).

Table 2 MCDA models comparative chart

Phases	Operating modes	ELECTRE	EVIAMIX	TOPSIS	WISM	AHP	MACBETH
Structuring the evaluation matrix(EM)	Square type: alternatives $J * criteria i$		Performance			Coefficients	Data
	Whose elements E_{ji} considered criteria	Qualitative (absolute values) and quantitative (coefficients range 0-1)		Linear	Only quantitative (coefficients range 0-1)	Only quantitative (coefficients range 0-1)	Only qualitative (absolute values)
Standardisation of the EM data in homogeneous elements N_{ji}	By applying functions	Utility			Already standardised		Utility
	Structuring of the N_{ji} in	standardised square type ($J * N_{ji}$) matrix (SM)					Criteria scales (CS) Linear graphic
Matching criteria (and sub-criteria, if present) with their weights for the weighting of standardised data	By applying	Logical steps		Mathematical Formulae			
	Which consists in	Define the differences between the alternatives	Multiply each element of the SM/EM for its weights $N_{wji} = N_{ji} \times W_i$			Multiply the EM for the vector weights $N_{wji} = [MV] \times [W]$	Multiply each element of the CS for its weights $N_{wji} = N_{ji} \times W_i$
Aggregation of weighted data and ranking of the alternatives	By applying method of	Indices of concordance and discordance	Weighted sum	Indices of concordance and discordance		Weighted sum	
	Which consists in	Pairwise comparison of all the alternatives j and measurement of concordance and discordance indices	Sum of the weighted elements (Nwji) Relative to the alternative J_{th} $TS_j = \sum N_{wji}$	Pairwise comparison of all the alternatives j and measurement of concordance and discordance indices		Sum of the weighted elements (Nwji) Relative to the alternative J_{th} $TS_j = \sum N_{wji}$	

Source: Reworking from (Guarini et al. 2015)

Table 3 Main consultation TP

Small number of stakeholders	Focus group (FG)	Discussion conducted among a limited group of people interacting in the presence of an evaluator (supported by a tutor) with the aim of describing the nature and the main dimensions of a problem
	Beneficiary analysis (BA)	Qualitative research method based primarily on the use of the following data collection techniques: individual interviews on specific topics, FG and PO. The field of investigation is restricted to exploration of the views of the parties (to understand their level of satisfaction) who suffer directly the effects of an intervention, before or during its implementation
	Stakeholders analysis (SA)	Techniques for detecting interest, role, expected effects, of different groups with respect to a particular program/intervention. This analysis can be structured by the use of the same data collection techniques already identified with BA
Large number of stakeholders	Participant observation (PO)	Technique to get in-depth information by understanding the effects of a particular intervention on the recipients, whereas the internal perception of reality is different from that which is outside. The technique involves a researcher occurred in a context that wants to study, giving an inside view of the problem studied
	Neighbourhood walks (NW)	Active listening of the territory, based on the idea that the knowledge of the people who live there, can be build social relationships of fundamental importance because the intervention choices in that context are defined in accordance with a integrated and broad vision
	Prioritising (P)	Useful technique to order the preferences in particular by when, where and how to meet the needs. It can also be used to create consensus on some decisions through a reflection on the priorities of each action
	Balance priorities (BP)	Technique which involved the communities around complex decisions regarding market devoid goods (simulation in a hypothetical supply market about a given question). It can be used to collect information concerning declared preferences, generally when initiatives focused on the better meet the needs expressed by specific social groups are designed

3.3 *Techniques to encourage participation*

The TP include a diverse selection of tools for the involvement, in the decision-making processes, of different subjects (stakeholders), organised into categories.

The involvement may be:

- simple (consultation) in the event that the points of view of different categories of stakeholders may be kept separate
- complex (interaction) in the event that it is necessary to express a single point of view among the categories of stakeholders.

With reference to the consultation techniques, it is distinguished various approaches depending on the number and the type of subject involved and on the implementation methods (Table 3).

3.4 Features of the techniques to be used for the construction of the evaluation procedure

As illustrated in the previous paragraphs (3.1, 3.2, 3.3), it is possible to note that each valuation method analysed is characterised by aspects of specificity which determine the characteristics to consider when there is the need to select the model/s enabling to give an appropriate response to the evaluative question raised in accordance with the objectives, the type and the characteristics of the question to be answered, also in relation to the data to sift through.

The issues that characterise the features to be considered for the choice of the model are, for:

- a The AF [Table 4(a)]:
 - a.1 temporality/a-temporality of the evaluation
 - a.2 detail level of the analysis data (high, medium, low)
 - a.3 interconnection between financial data and others (yes; no)
- b The MCDA [Table 4(b)]:
 - b.1 relationship between elements of the matrix from which it depends the possibility of determining the synthesis results of each evaluation alternative (quantitative or just majority/minority)
 - b.2 typology of sub-criteria (quantitative; qualitative; mixed)
 - b.3 number of stakeholders (organised into categories) to involve into the decision-making process (high, medium, low)
 - b.4 time available for the implementation of the evaluation procedure (long, medium, short)
 - b.5 level of difficulty in changing the template syntax (high, medium, low).
- c The TP [Table 4(c)]:
 - c.1 comprehensibility of TP tools even for non-experts (high, medium, low)
 - c.2 time available for the implementation of the evaluation procedure (high, medium, low)
 - c.3 risk of conflict (high, medium, low).

Table 4(a) Features of AF techniques comparative chart

<i>Aspects</i>	<i>Criteria for cataloguing features</i>	<i>Features</i>		
		<i>VT</i>	<i>CRA</i>	<i>CVPA</i>
Temporality/a-temporality of analysis	Temporality (T)	A	T	A
	A-temporality (A)			
Detail level of the analysis data	High (H)	M	L	H
	Medium (M)			
	Medium (M)			
Interconnection between financial data and others	Yes	No	No	Yes
	No			

Table 4(b) Features of MCDA techniques comparative chart

<i>Aspects</i>	<i>Criteria for cataloguing features</i>	<i>Features</i>						
		<i>WSM</i>	<i>AHP</i>	<i>EVAMIX</i>	<i>ELECTRE</i>	<i>TOPSIS</i>	<i>MACETH</i>	
Relationship between elements of the matrix from which it depends the possibility of determining the synthesis results of each evaluation alternative	Quantitative (Q)	Q	M	Q	Q	Q	Q	
	Majority/minority (M)							
Typology of sub-criteria	Quantitative (QUAN)	M	M	M	QUAN	M	QUAL	
	Qualitative (QUAL)							
Number of stakeholders (organised into categories) to involve into the decision-making process	Mixed (M)							
	High (H)	H	L	H	M	L	H	
	Medium (M)							
	Low (B)							
Time available for the implementation of the evaluation procedure	Long (L)	S	L	M	L	M	M	
	Medium (M)							
	Short (S)							
Level of difficulty in changing the template syntax	High (H)	L	H	M	H	M	H	
	Medium (M)							
	Low (L)							

Table 4(c) Features of TP techniques comparative chart

<i>Aspects</i>	<i>Criteria for cataloguing features</i>	<i>Features</i>						
		<i>FG</i>	<i>BA</i>	<i>SA</i>	<i>NW</i>	<i>PO</i>	<i>P</i>	<i>BP</i>
Comprehensibility of TP tools even for non-experts	High (H)	M	H	H	H	L	M	M
	Medium (M)							
	Low (L)							
Tempi a disposizione per l'implementazione della procedura di valutazione	Long (L)	M	S	S	L	L	M	M
	Medium (M)							
	Short (S)							
Rischio di conflitto	High (H)	H	L	L	M	L	M	H
	Medium (M)							
	Low (L)							

4 The choice about the evaluation techniques to integrate in the evaluation process

4.1 Elements structuring the evaluation of the public interest in PPPN

The choice about the evaluation techniques used for the procedure proposed for assessing the public interest in one-or-more alternative PPPN was carried out taking into account that:

- Evaluating ordinarily is carried out separately for each initiative; although, in certain circumstances, it may be a need to compare, for example, two or more proposals (including their alternatives) related to the same area. In such a case the evaluation is therefore concerned with not one but more PPPN initiatives in respect of which to assess the public interest.
- It must be defined a set of criteria, sub-criteria and 'base' indicators (Table 5) representatives of the different aspects that need to be considered in accurately determining the public interest of a PPPN initiative:
 - 1 Three sub-criteria and related financial indicators that allow to define an equitable distribution of surplus value determined by the PPN initiative according to the requirements of Article 16, subparagraph 4, letter d-ter) of Presidential Decree n. 380/2001
 - 2 Three sub-criteria and related financial indicators qualified as key elements for the evaluation of a PPP, both in EU Directives n. 23 and 24 of 2014 and in the European Commission Green Paper on PPP.
 - 3 Three sub-criteria and related socio-economic indicators identified taking into account the aspects of social-economic development considered in local and supra-local economic planning documents.

- 4 Four sub-criteria and related environmental indicators identified taking into account the main aspects of environmental protection covered by the community Directive n. 41 of 2001.
 - 5 Four sub-criteria and related technical indicators identified taking into account the principal elements, subject to verification, taken from the administrative documentation PPPN. While considering that the offered set of criteria, sub-criteria and indicators allows an almost complete assessment of the public interest of a PPPN initiative, it should be noted that in relation to the specificity of the cases subject to evaluation, it might still be necessary proceeding to modification (addition/reduction) of sub-criteria and indicators. The set of sub-criteria and indicators proposed has been built on the basis of European and Italian regulatory framework; if the assessment procedure must be implemented in different contexts from the Italian one, it should test the set of sub-criteria and indicators to allow the evaluation of the initiative regarding to the preponderant elements in the context in which the procedure is being applied.
- The stakeholders categories that should be considered are: subjects (technical and/or political) belonging to Public Administrations (qualified in order to the initiative: municipality, province, region); sample of citizens (citizenship); para-institutional subjects: neighbourhood committees, non-profit organisation; administrators/members of business groups active in the local area (local entrepreneurship).

Table 5 Evaluation procedure criteria, sub-criteria and indicators

<i>Criteria (C)</i>		<i>Soub-criteria (SC)</i>	<i>Indicators (I)</i>
Financial	1	Extraordinary contribution	Extra-profit expressed in % of added value
	2	Financial balance in relationship to dimensional parameters of initiative	% building potential compared to the minimum to balance the initiative
	3	Riskiness of initiative	Operating leverage coefficient
Procedural	4	Guarantees for the public	% of the amount corresponding to the plus-public value paid or guaranteed by
	5	Reliability of promoters	Years of business of the company proposing the initiative
	6	Implementation time (duration of works)	Months for the full implementation as of the date of approval
Socio-economic	7	Workforce during operation	% number of works to be used in the initiatives (public and private) provided for in the PII/number of unemployed people in the municipal area (ISTAT data)
	8	Workforce in the construction phase	% number of workers to be employed for a one-year period in the construction industry for the realisation of the planned works in the PII / number of unemployed workers in the construction sector in the region (ISTAT data)
	9	Level of attractiveness	Attractiveness [over-municipal (OM); municipal (M); neighbourhood (N)] of functions of initiative]

Table 5 Evaluation procedure criteria, sub-criteria and indicators (continued)

<i>Criteria (C)</i>		<i>Soub-criteria (SC)</i>	<i>Indicators (I)</i>
Environmental and landscape	10	Newly transformed land area	Sq. m of natural surface area transformed (notwithstanding the provisions of the previously applicable PRG in the case of areas to be transformed, or the pre-construction situation for areas that are already compromised)
	11	Pollution level	N. of environmental component in risk condition (air, water, soil, subsoil, acoustic)
	12	Industrial hazards	Number of hazardous activities pursuant to Legislative Decree no. 334/99 (also referring to adjacent areas)
	13	Landscape compatibility	Compatibility of initiative with prescriptions (CP), directions (CD) or prescription and directions (CPD) in the protection rules landscape (qualitative)
Technical (urban)	14	Pro-capita land	Sq. m for inhabitant
	15	Public facilities (squares, gardens, parks)	% total sq. m of public green areas and services compared to the total area of the initiative
	16	Level of road infrastructure	Road surface area / total surface area (%)
	17	Urban fabric	Level of integration for planning and volumetric design of the PII within the urban sector in question (Total; Partial; Null)

4.2 Requirements of the public interest evaluation in order to the choice of techniques to be used in the evaluation process

For the selection of techniques to use in the evaluation process it is essential to identify the requirements of the public interest assessment procedure, deduced by the analysis of its own structural elements (par. 4.1).

To select the MCDA technique, it should be considered, with reference to:

- The number of initiatives (alternative) subject to assessment:
 - 1 the possibility of a quantitative comparison among the elements of the matrix; as a matter of fact, it should be excluded the possibility of using comparisons of majority/minority because the procedure shown here can also usually be applied in the evaluation of a single initiative PPPN, not only in the evaluation of more ones
- The set of criteria, sub-criteria and indicators:
 - 2 the joint management of evaluation sub-criteria, both quantitative and qualitative
 - 3 the quick organisation of implementation, despite the amount of data to be collected and processed (because of the large number of sub-criteria and of the different categories of stakeholders)

- The number of stakeholders categories to involve:
 - 4 the easy implementation of the technique to reiterate the evaluation process as many times as the included number of stakeholder categories
 - 5 the structure on a simple and amendable math basis, to be effectively integrated with the other evaluation techniques.

In the selection of AF, it is to be considered, with reference to:

- The financial sub-criteria, the need of having:
 - 1 an element a-temporality for being the estimated plus-value based on fixed costs and revenues constant over time
 - 2 a high level of data detail to be considered (mainly costs and revenues), which usually reduces the risk of uncertainty of assessments
 - 3 from the stronger interconnections with the dimensional data of the initiative subject to assessment, depend the settlement sizing financial result.

With regard to the identification of the TP it should disclose, with reference to:

- The set of criteria, sub-criteria and indicators:
 - 1 their wide articulation which entails the need to get a feedback on specific aspects from the stakeholders, without causing repercussions on the evaluation process simplicity
- The number of stakeholders categories to involve:
 - 2 the existence of non-experts stakeholders that requires the use of simple and easily understood tools
 - 3 given the heterogeneity, a risk reduction about potential conflict.

Table 6 Proposed WSM declination with insertion of CVPA and SA

<i>Weighted sum model</i>	<i>Target</i>	<i>Additions</i>	<i>Target</i>
Structuring the evaluation matrix (EM)	Impact matrix	Cost volume profit analysis Analysis of the initiative/s subject to evaluation	Compilation of evaluation matrix
Standardisation of the EM data in homogeneous elements N _{ji}	Coefficients matrix	Stakeholder analysis	Transformation of impact in coefficients
Matching criteria (and sub-criteria, if present) with their weights for the weighting of standardised data	Weighted coefficients matrix	Stakeholder analysis	Weightening of criteria and sub-criteria
Aggregation of weighted data and ranking of the alternatives	Appraisal score (sum of weighted coefficients)	-	-

A comparison of the requirements of the public interest assessment, just described in the comparative table about the properties that characterise the different MCDA, AF and TP techniques, makes possible to identify as eligible for the purposes of their joint use:

- 1 WSM as MCDA technique
- 2 CVPA as AF technique
- 3 SA as TP technique. The procedure proposed for the assessment of the public interest in the PPPN initiative is, therefore, a new version of WSM, developed through integration, in its syntax, with CVPA and SA (Table 6).

5 The evaluation procedure

5.1 Structure of evaluation procedure

The proposed evaluation procedure is structured around the following steps:

- Analysis of the initiative subject to evaluation.
- Checking of set of criteria, sub-criteria and indicators (to be used for the evaluation).
- CVPA implementation (break-even point determination, gross contribution margin, operating leverage coefficient).
- SA implementation (identification of categories of stakeholders aimed to determine:
 - a the performance acceptance level with reference to the individuals sub-criteria
 - b the sub-criteria weight).
- Evaluation matrix (EM) construction (completion of the counterfoil with the impacts related to the sub-criteria; transformation of impacts in coefficients through the use of the SA point a results).
- Allocation of weights to the EM sub-criteria (utilisation of the SA point b results).
- Aggregation of weighed coefficients (processing of the EM data for the appraisal score determination).
- Appraisal score processing for:
 - a the expression of synthesis judgments
 - b elaboration of ranking.

5.2 Analysis of the initiative/s subject to evaluation

The analysis of the initiative/s subject to the public interest evaluation, is carried out through the examination of the available documentation (technical and descriptive drawings, administrative acts concerning the adoption and approval procedures); it is aimed to extrapolate the main data concerning the general and dimensional aspects of the initiative. These data, properly processed, are used to determine the impacts on financial, procedural, socio-economic, environmental, technical-urban sub-criteria to be included in the EM.

5.3 Checking of set of criteria, sub-criteria and indicators

With reference to the contextual conditions and to the specific objectives of the PPPN initiative/s to be submitted to the public interest evaluation, it must be checked the

opportunity of carrying out an integration and/or a reduction of criteria (Cn), sub-criteria (SCn) and related indicators (In), representing the basic reference set for the public interest evaluation (see sub-par. 4.1.) and that should be considered to fill the EM.

5.4 CVPA implementation

The CPVA implementation is carried out through data related to settlement consistency of the interventions planned for the examined initiative/s, to costs, to revenues indicated in the documents examined in the initiative/s subject to evaluation analysis phase.

As described in par. 3.1, CVPA allows to detect: the break-even point; the extra-profit (I1) (from the gross contribution margin); the break-even point (I2); the operating leverage coefficient of the initiative (I3); data entered in the MV as input, in order to indicate the impacts related to the financial sub-criteria.

5.5 Stakeholder analysis implementation

In order to implement the SA, it must be identify which categories of stakeholders among those ones identified in the previous sub-par. 4.1. it seems appropriate to include and, then, to interview. It is necessary to prepare questionnaires to be submitted to a significant sample of subjects representing the different categories of stakeholders. The data obtained from the interviews of individuals, should be processed through a mathematical average, in order to produce, articulated by category:

- a The coefficients $[c(SCn)]$ for the transformation of the EM impacts $[i(SCn)]$. In order to determine the coefficients, it should be defined, for each sub-criteria, the impacts-threshold $[it(Stn; lsx)]$ needed to generate a certain level of satisfaction $ls(x)$ [(with $x =$ very high (VH = 1.00), high (H = 0.75), medium (M = 0.50), low (L = 0.25), very low (VL = 0.00)] [Table 7(a)]; through specific logic functions it will be possible to verify which level of satisfaction is generated by a particular impact and consequently transform it into coefficient through the following logic belonging functions:

$$[c(SCn)] = 1,00 \dots \Rightarrow \dots [i(SCn)] > it(Stx; lsMA)$$

$$[c(SCn)] = 0,75 \dots \Rightarrow \dots [i(SCn)] > it(Stx; lsA)$$

$$[c(SCn)] = 0,50 \dots \Rightarrow \dots [i(SCn)] > it(Stx; lsM)$$

$$[c(SCn)] = 0,25 \dots \Rightarrow \dots [i(SCn)] > it(Stx; lsB)$$

$$[c(SCn)] = 0,00 \dots \Rightarrow \dots [i(SCn)] > it(Stx; lsMB)$$

Table 7(a) Stakeholders impacts-threshold and coefficients (point a SA)

Level of satisfaction for SCn $ls(x)$	Impact-threshold				Coefficient $c(SCn; Stn)$
	Stakeholder 1	Stakeholder 2	...	Stakeholder n	
Very high	$it(St1; lsVH)$	$it(St2; lsVH)$	...	$it(Stn; lsVH)$	1.00
High	$it(St1; lsH)$	$it(St2; lsH)$	...	$it(Stn; lsH)$	0.75
Medium	$it(St1; lsM)$	$it(St2; lsM)$	...	$it(Stn; lsM)$	0.50
Low	$it(St1; lsL)$	$it(St2; lsL)$	...	$it(Stn; lsL)$	0.25
Very low	$it(St1; lsVL)$	$It(St2; lsVL)$	...	$It(Stn; lsVL)$	0.00

Table 7(b) Attribution of weights to the sub-criteria (point b SA)

Criteria	Sub-criteria (SC)	Indicators (I)	Stakeholders (St)			
			St1 Weight	St2 Weight	Stn Weight	
Financial	1	Extraordinary contribution				
	2	Financial balance in relationship to dimensional parameters of initiative	Extra-profit expressed in % of added value	w(SC1; St1)	w(SC1; St2)	w(SC1; Stn)
Procedural	3	Riskiness of initiative	% building potential compared to the minimum to balance the initiative	w(SC2; St1)	w(SC2; St2)	w(SC2; Stn)
	4	Guarantees for the public	Operating leverage coefficient	w(SC3; St1)	w(SC3; St2)	w(SC3; Stn)
	5	Reliability of promoters	% of the amount corresponding to the plus public value paid or guaranteed by	w(SC4; St1)	w(SC4; St2)	w(SC4; Stn)
	6	Implementation time (duration of works)	Years of business of the company proposing the initiative	w(SC5; St1)	w(SC5; St2)	w(SC5; Stn)
Socio-economic	7	Workforce during operation	Months for the full implementation as of the date of approval	w(SC6; St1)	w(SC6; St2)	w(SC6; Stn)
	8	Workforce in the construction phase	% number of works to be used in the initiatives (public and private) provided for in the PII/number of unemployed people in the municipal area (ISTAT data)	w(SC7; St1)	w(SC7; St2)	w(SC7; Stn)
	9	Level of attractiveness	% number of workers to be employed for a one year period in the construction industry for the realisation of the planned works in the PII/number of unemployed workers in the construction sector in the region (ISTAT data)	w(SC8; St1)	w(SC8; St2)	w(SC8; Stn)
			Attractiveness [over-municipal (OM); municipal (M); neighbourhood (N)] of functions of initiative]	w(SC9; St1)	w(SC9; St2)	w(SC9; Stn)

Table 7(b) Attribution of weights to the sub-criteria (point b SA) (continued)

<i>Criteria</i>	<i>Sub-criteria (SC)</i>	<i>Indicators (I)</i>	<i>Stakeholders (St)</i>				
			<i>St1 Weight</i>	<i>St2 Weight</i>	<i>Stn Weight</i>		
Environmental and landscape	10	Newly transformed land area	Sq. m of natural surface area transformed (notwithstanding the provisions of the previously applicable PRG in the case of areas to be transformed, or the pre-construction situation for areas that are already compromised)	w(SC10; St1)	w(SC10; St2)	...	w(SC10; Stn)
	11	Pollution level	N. of environmental component in risk condition (air, water, soil, subsoil, acoustic)	w(SC11; St1)	w(SC11; St2)	...	w(SC11; Stn)
	12	Industrial hazards	Number of hazardous activities pursuant to Legislative Decree no. 334/99 (also referring to adjacent areas)	w(SC12; St1)	w(SC12; St2)	...	w(SC12; Stn)
	13	Landscape compatibility	Compatibility of initiative with prescriptions (CP), directions (CD) or prescription and directions (CPD) in the protection rules landscape (qualitative)	w(SC13; St1)	w(SC13; St2)	...	w(SC13; Stn)
Technical (urban)	14	Pro-capita land	Sq. m for inhabitant	w(SC14; St1)	w(SC14; St2)	...	w(SC14; Stn)
	15	Public facilities (squares, gardens, parks)	% total sq. m of public green areas and services compared to the total area of the initiative	w(SC15; St1)	w(SC15; St2)	...	w(SC15; Stn)
	16	Level of road infrastructure	Road surface area / total surface area (%)	w(SC16; St1)	w(SC16; St2)	...	w(SC16; Stn)
	17	Urban fabric	Level of integration for planning and volumetric design of the PII within the urban sector in question (Total; Partial; Null)	w(SC17; St1)	w(SC17; St2)	...	w(SC17; Stn)
Total			100	100	...	100	

- b The sub criteria weights [$w(SCn; Stn)$] expressed through the ascribed level of importance so that the sum of all sub-criteria weights is equal to 100. For the allocation of the weight to each sub-criterion it may be used different techniques, to be selected according to the number of interviewees and the level of ‘robustness’ to be achieved: direct assignment; pairwise comparison; paired comparison technique; Delphi method; methods based on a single order. In the framework of the proposed methodology, it has assumed the direct allocation because it is the one that meets the requirements of concreteness and promptness of the evaluation process [Table 7(b)].

5.6 Construction of an EM

The construction of an EM (Table 8) is carried out through:

- a Compilation of a matrix containing the impacts [$i(SCn)$] related to the sub-criteria obtained by inserting the input data (which express the performances) of the initiative/s subject to evaluation, referred to each individual evaluation sub-criterion; these data are derived, as mentioned above (directly or through reprocessing) by the analysis of the initiative/s and by the CVPA.
- b Transformation, into coefficient, of the matrix impacts data [$c(SCn)$] by using the data obtained through the SA to the point a. For this purpose, distinctly for each stakeholders category, it must be given a coefficient [$c(SCx)$] variable between 0 and 1 with regular intervals for each impact [$i(SCn)$] depending on perceived satisfaction (by stakeholder category) on the impact performance, expressed through impact-threshold satisfaction [$it(Stn; lxx)$] obtained from the information set out in SA point a.

Table 8 EM with impacts and coefficients

<i>SC</i>	<i>Impact</i>	<i>Coefficient</i>	...	<i>Impact</i>	<i>Coefficient</i>
1	$i(SC1; A1)$	$c(SC1; A1; Stn)$	...	$i(SC1; An)$	$c(SC1; An; Stn)$
2	$i(SC2; A1)$	$c(SC2; A1; Stn)$	...	$i(SC2; An)$	$c(SC2; An; Stn)$
3	$i(SC3; A1)$	$c(SC3; A1; Stn)$	...	$i(SC3; An)$	$c(SC3; An; Stn)$
4	$i(SC4; A1)$	$c(SC4; A1; Stn)$	...	$i(SC4; An)$	$c(SC4; An; Stn)$
5	$i(SC5; A1)$	$c(SC5; A1; Stn)$	...	$i(SC5; An)$	$c(SC5; An; Stn)$
6	$i(SC6; A1)$	$c(SC6; A1; Stn)$	...	$i(SC6; An)$	$c(SC6; An; Stn)$
7	$i(SC7; A1)$	$c(SC7; A1; Stn)$	...	$i(SC7; An)$	$c(SC7; An; Stn)$
8	$i(SC8; A1)$	$c(SC8; A1; Stn)$	...	$i(SC8; An)$	$c(SC8; An; Stn)$
9	$i(SC9; A1)$	$c(SC9; A1; Stn)$	...	$i(SC9; An)$	$c(SC9; An; Stn)$
10	$i(SC10; A1)$	$c(SC10; A1; Stn)$	...	$i(SC10; An)$	$c(SC10; An; Stn)$
11	$i(SC11; A1)$	$c(SC11; A1; Stn)$	...	$i(SC11; An)$	$c(SC11; An; Stn)$
12	$i(SC12; A1)$	$c(SC12; A1; Stn)$	...	$i(SC12; An)$	$c(SC12; An; Stn)$
13	$i(SC13; A1)$	$c(SC13; A1; Stn)$	...	$i(SC13; An)$	$c(SC13; An; Stn)$
14	$i(SC14; A1)$	$c(SC14; A1; Stn)$	...	$i(SC14; An)$	$c(SC14; An; Stn)$
15	$i(SC15; A1)$	$c(SC15; A1; Stn)$	...	$i(SC15; An)$	$c(SC15; An; Stn)$
16	$i(SC16; A1)$	$c(SC16; A1; Stn)$	...	$i(SC16; An)$	$c(SC16; An; Stn)$
17	$i(SC17; A1)$	$c(SC17; A1; Stn)$	...	$i(SC17; An)$	$c(SC17; An; Stn)$

Table 9 Determination of the weighted coefficients

SC	Alternative 1			Alternative n		
	Coefficient	Weight	Coefficient weight	Coefficient	Weight	Coefficient weighted
1	$c(SC1; AI; Stn)$	$w(SC1; Stn)$	$cw(SC1; AI; Stn)$	$c(SC1; An; Stn)$	$w(SC1; Stn)$	$cw(SC1; An; Stn)$
2	$c(SC2; AI; Stn)$	$w(SC2; Stn)$	$cw(SC2; AI; Stn)$	$c(SC2; An; Stn)$	$w(SC2; Stn)$	$cw(SC2; An; Stn)$
3	$c(SC3; AI; Stn)$	$w(SC3; Stn)$	$cw(SC3; AI; Stn)$	$c(SC3; An; Stn)$	$w(SC3; Stn)$	$cw(SC3; An; Stn)$
4	$c(SC4; AI; Stn)$	$w(SC4; Stn)$	$cw(SC4; AI; Stn)$	$c(SC4; An; Stn)$	$w(SC4; Stn)$	$cw(SC4; An; Stn)$
5	$c(SC5; AI; Stn)$	$w(SC5; Stn)$	$cw(SC5; AI; Stn)$	$c(SC5; An; Stn)$	$w(SC5; Stn)$	$cw(SC5; An; Stn)$
6	$c(SC6; AI; Stn)$	$w(SC6; Stn)$	$cw(SC6; AI; Stn)$	$c(SC6; An; Stn)$	$w(SC6; Stn)$	$cw(SC6; An; Stn)$
7	$c(SC7; AI; Stn)$	$w(SC7; Stn)$	$cw(SC7; AI; Stn)$	$c(SC7; An; Stn)$	$w(SC7; Stn)$	$cw(SC7; An; Stn)$
8	$c(SC8; AI; Stn)$	$w(SC8; Stn)$	$cw(SC8; AI; Stn)$	$c(SC8; An; Stn)$	$w(SC8; Stn)$	$cw(SC8; An; Stn)$
9	$c(SC9; AI; Stn)$	$w(SC9; Stn)$	$cw(SC9; AI; Stn)$	$c(SC9; An; Stn)$	$w(SC9; Stn)$	$cw(SC9; An; Stn)$
10	$c(SC10; AI; Stn)$	$w(SC10; Stn)$	$cw(SC10; AI; Stn)$	$c(SC10; An; Stn)$	$w(SC10; Stn)$	$cw(SC10; An; Stn)$
11	$c(SC11; AI; Stn)$	$w(SC11; Stn)$	$cw(SC11; AI; Stn)$	$c(SC11; An; Stn)$	$w(SC11; Stn)$	$cw(SC11; An; Stn)$
12	$c(SC12; AI; Stn)$	$w(SC12; Stn)$	$cw(SC12; AI; Stn)$	$c(SC12; An; Stn)$	$w(SC12; Stn)$	$cw(SC12; An; Stn)$
13	$c(SC13; AI; Stn)$	$w(SC13; Stn)$	$cw(SC13; AI; Stn)$	$c(SC13; An; Stn)$	$w(SC13; Stn)$	$cw(SC13; An; Stn)$
14	$c(SC14; AI; Stn)$	$w(SC14; Stn)$	$cw(SC14; AI; Stn)$	$c(SC14; An; Stn)$	$w(SC14; Stn)$	$cw(SC14; An; Stn)$
15	$c(SC15; AI; Stn)$	$w(SC15; Stn)$	$cw(SC15; AI; Stn)$	$c(SC15; An; Stn)$	$w(SC15; Stn)$	$cw(SC15; An; Stn)$
16	$c(SC16; AI; Stn)$	$w(SC16; Stn)$	$cw(SC16; AI; Stn)$	$c(SC16; An; Stn)$	$w(SC16; Stn)$	$cw(SC16; An; Stn)$
17	$c(SC17; AI; Stn)$	$w(SC17; Stn)$	$cw(SC17; AI; Stn)$	$c(SC17; An; Stn)$	$w(SC17; Stn)$	$cw(SC17; An; Stn)$

5.7 Weights assignment to the EM sub-criteria

For each sub-criterion should be assigned a weight, obtained through the point b SA. It is thus possible to obtain some weighted coefficients [$wc(SCn; Stn)$] multiplying each of the input data transformed into coefficients detailed in the EM [$c(SCn)$] by the respective weights [$w(SCn; Stn)$] (Table 9) through the formula:

$$wc(SCn; Stn) = c(SCn) * w(SCn; Stn)$$

5.8 Aggregation of weighted coefficients for the determination of appraisal score

At this stage, for each stakeholders category (Stn) it must be carried out the aggregation of the weighted coefficients [$wc(SCn; Stn)$] in order to obtain, for each stakeholders category, an appraisal score [$as(Stn)$], evaluation output datum through the formula:

$$as(Stn) = c_{(SC1)} * w_{(SC1)} + c_{(SC2)} * w_{(SC2)} \cdots + c_{(SCn)} * w_{(SCn)} = \sum_{x=1}^n C_{(SCx)} * w_{(SCx)}$$

where:

$as(Stn)$ appraisal score for the stakeholder category n

$c(SCx)$ coefficient given by the category of stakeholders n for the element of evaluation sub-criterion (SCx).

5.9 Processing of appraisal scores and determination of the evaluation results

At this stage, the appraisal score of each stakeholder category [$as(Stn)$] should be transformed (through a classification) into a synthesis judgment [$sj(Stn)$] about the public interest which expresses, depending on the considered thresholds (VH, H, M, L, VL), the level of public interest significance in the examined PPPN initiative/s.

Therefore, it is necessary:

- 1 to identify the threshold rating of the appraisal score (VH, H, M, L, VL)
- 2 to verify to which of these categories the appraisal score belongs.

The rating threshold may be calculated as, for each identified satisfaction level (VH, H, M, L, VL) it correspond a 'category' appraisal score [$asc(lsx)$], inferable by the formula:

$$\begin{aligned} asc(lsx) &= ct_{(SC1)} * w_{(SC1)} + ct_{(SC2)} * w_{(SC2)} + \cdots + ct_{(SCn)} * w_{(SCn)} \\ &= \sum_{x=1}^n ct_{(SCx)} * w_{(SCx)} \end{aligned}$$

where:

$asc(lsx)$ 'category' appraisal score related to the level of satisfaction x

$ct(SCx)$ coefficient corresponding to the level of satisfaction x (VH = 1; H = 0.75; M = 0.50; L = 0.25; VL = 0.00) attributed to the evaluation element sub-criterion (SCx)

$w(SCx)$ weight of the evaluation element sub-criterion SCx (resulting by SA).

Being the satisfaction coefficient $[ct(x)]$ the same for all the sub-criteria, the mathematical formula four may be simplified as follow:

$$asc(lsx) = ct(x)(w_{(SC1)} + w_{(SC2)} + \dots + w_{(SCn)})$$

By substituting the unknowns of the formula five [satisfaction coefficient (VH = 1.00; H = 0.75; M = 0.50; L = 0.25; VL = 0.00); sum of the sub-criteria weights $[SC(x)]$ equal to 100, it is immediately possible to determine, for each satisfaction level, the ‘category’ appraisal score $asc(lsx)$ through the following formulas:

$$asc_{(VH)} = 1.00 * (100) = 100$$

$$asc_{(H)} 0.75 * (100) = 80$$

$$asc_{(M)} 0.50 * (100) = 50$$

$$asc_{(L)} 0.25 * (100) = 25$$

$$asc_{(VL)} 0.00 * (100) = 0$$

The ‘category appraisal score’ are used as threshold (for the appraisal score rating). It is thus possible to set up categories of public interest rating, demarcated because of a geometrical distance elapsing, among the different ‘category’ appraisal score $asc(lsx)$, from theoretical threshold of satisfaction $[tts(lsx; up)]$; $[tts(lsx; lo)]$ (Table 10).

Table 10 Rating categories: upper and lower thresholds

Level of public interest	Classification thresholds			
	Upper		Lower	
Very high	$tts(VH; up)$	100	$tts(VH; lo)$	87.6
High	$tts(H; up)$	87.5	$tts(H; lo)$	62.6
Medium	$tts(M; up)$	62.5	$tts(M; lo)$	37.6
Low	$tts(L; up)$	37.5	$tts(L; lo)$	12.6
Very low	$tts(VL; up)$	12.5	$tts(VL; lo)$	0

It is possible to verify where it flows the PPPN initiative appraisal score as (for each stakeholder category) as calculated at the previous paragraph 5.8 and to associate it, as a consequence, with the related synthesis judgment $[sj(STn)]$ through the logical functions of belonging to the global categories of ratings:

$$[sj(STn)] = VH \dots \Rightarrow \dots tts(VH; up) > [as] > tts(VH; lo)$$

$$[sj(STn)] = H \dots \Rightarrow \dots tts(H; up) > [as] > tts(H; lo)$$

$$[sj(STn)] = M \dots \Rightarrow \dots tts(M; up) > [as] > tts(M; lo)$$

$$[sj(STn)] = L \dots \Rightarrow \dots tts(L; up) > [as] > tts(L; lo)$$

$$[sj(STn)] = VL \dots \Rightarrow \dots tts(VL; up) > [as] > tts(VL; lo)$$

The synthesis judgement expresses a summary about the public interest of the initiative subject to evaluation.

It is also possible to determine a synthesis rating, not distinguished on the basis of the stakeholder categories, but general and related to the public interest about the PPPN initiative, through:

- The calculation of a mid-general appraisal score [$as(m)$] referred to all the stakeholder categories included in the decision-making process through the following formula:

$$sj(An) = [sj(St1) + sj(St2) + \dots + sj(Stn)] / n(St)$$

- The same process followed for the global rating of the appraisal score related to each stakeholder category, the verification of the mid appraisal score belonging to the global class [$as(m)$]; in such a way it is possible to define the general synthesis rating through the logical functions of belonging to the global categories of rating.

Should it be necessary to evaluate several PPPN initiatives, the appraisal scores are used in order to form a ranking among the same initiatives. The ranking provides an ordering of initiatives in relation to the size of their public interest.

Through the evaluation four situations may arise:

- 1 PPPN initiatives respectful of the requirement laid down in the Article 16, subparagraph 4, letter d-ter), D.P.R. 380/2001 and characterised by a public interest with, at least, a 'mid' level; in this case, the evaluation reinforces the choice of the AC in order to the adoption/approval of the initiative.
- 2 PPPN initiatives respectful of the requirement laid down in the Article 16, subparagraph 4, letter d-ter), D.P.R. 380/2001 and characterised by a public interest below the 'mid' level; in this case, the evaluation, as a control tool, may represent the basis for changing the content of the proposed initiative.
- 3 PPPN initiatives not respectful of the requirement laid down in the Article 16, subparagraph 4, letter d-ter), D.P.R. 380/2001 and characterised by a public interest with, at least, a 'mid' level; in this case, the initiative, nevertheless not admissible, may be accepted after a new determination of the extraordinary contribution of urbanisation.
- 4 PPPN initiatives not respectful of the requirement laid down in the Article 16, subparagraph 4, letter d-ter), D.P.R. 380/2001 and characterised by a public interest below the 'mid' level; in this case, the initiative can be considered, without any doubt, not admissible and rejected.

6 Application of the assessment model to a case study: the urban transformation of an area in Santa Croce neighbourhood in Mentana (RM)

6.1 Analysis of the initiative subject to evaluation

Subject of the application of the proposed evaluation procedure is an integrated action program (programma integrato di intervento, hereinafter PII, as legislative acronym), adopted in the 2008 (by the Mentana MU), approved in the 2009 (by the Lazio Regional

Council) and currently (2016) under implementation; It covers a portion of the area of about 5.7 ha in the town of Mentana (RM), Santa Croce area; That area is situated in the north of the historical village of Mentana, recently built (by privates, during the 80s/90s).

The whole area is served by the road Nomentana SP22A where it is grafted the secondary roads, making service for the settlements, as well as by the municipal road Reatina, internal dorsal for the most recent urban settlement.

Even if the initiative was definitely approved, through the application of the evaluation procedure it intends to verify if it was effectively worthy of adoption and approval and also if its implementation could continue or should be reformulated.

The PII was adopted and approved because of the measures provided for therein were deemed able to increase the urban quality, both in terms of quality of public and private interventions and in terms of allocation of spaces for public use.

The urban area where the PII falls within was, in fact, characterised, over time, by urban development essentially privatised, circumscribed within the perimeters of single lotting plans, modest in extension, without any relationship with the urban context in which were inserted.

At the time of presentation of the PII, have been found a series of territorial dysfunctions, substantially characterised by an excessive fragmentation of the areas for secondary urbanisation which prevented their actual use, especially for the allocation of the urban services.

The PII has planned interventions aimed at the resolution of the territorial deficiencies, as described, through the realisation of an integrated hub with buildings of private (with residential, commercial and touristic-recreational intended use) and public (particularly mandatory schools and recreational spaces) interest. In summary, the interventions foreseen in the PII provide the implementation, for the part:

- a of private interest, of:
 - a.1 a residential complex consisting of medium-sized apartments spread over small buildings and villas
 - a.2 a small centrality with, inside, commercial functions, private and receptive-recreational services.
- b of public interest, of:
 - b.1 a square with car parks annexed, adjacent to the private centrality
 - b.2 a primary school structure with the consistency of seven classrooms
 - b.3 a road infrastructure
 - b.4 areas equipped to meet the allocation of urban standards.

Public works in the PII are planned by and at the private proponent expenses, as deduction for primary and secondary urbanisation costs; the extraordinary contribution is equal to about € 2.5 M.

An examination of the documents constituting the PII enabled to collect data related to the procedural, socio-economic, environmental and technical-urbanistic aspects of the PII (Table 11).

Table 11 Summary of procedural, socio-economic, environmental and technical-urbanistic data of the PII

<i>Features</i>	<i>Unit of measure</i>	<i>Measure/datum</i>
Territorial dimension of initiative	sqm	56,980
Building potential (Gross)	sqm	16,025
Building potential index (Gross)	sqm/smq cm/smq	0.28 0.90
of which residential	sqm/smq	12,820
of which commercial	sqm/sqm	3,205
Urban standard	sqm	12,504
of which equipped	sqm	12,504
Land for public roads	sqm	11,684
Private land	sqm	32,792
Extra-ordinary contribution (EC)	€	2,500,000
Guarantee	%	100% of EC
Establishment of the company proposing	year	1967
Workforce during operation	n.	147
Workforce during construction phase (for 1 year)	n.	450
Relevance of function of the initiative	areal	Municipal
Environmental authorisation	-	Not necessary
Landscape authorisation	-	Authorised
Building type	type	Small buildings/villas/mall

6.2 *Verification of the set of criteria, sub-criteria and indicators (to be used in the evaluation)*

No special condition having found that impose the change of the set of criteria, sub-criteria and ‘basis’ indicators, for the purpose of this application, it is used the set of criteria, sub-criteria and indicators referred to in par. 4.1.

6.3 *CVPA implementation*

The data relating to the PII financial aspects were collected and organised by distinguishing fixed and variable costs, and revenues (Table 12), in order to proceed with the CVPA implementation (Table 13).

The CVPA results (break-even point, extra-profits and operating leverage coefficient) will be used for the compilation of MV impacts with respect to the financial sub-criteria. The estimate of the extra-profit in GVPA also allows you to verify, right from the start, the congruity of the initiative with the Article 16, subparagraph 4, letter d-ter), D.P.R. 380/2001; the extraordinary contribution, equal to about € 2.5 M., represents the 50% of the extra-profit estimated with the CVPA, equal to about € 0.5 M., thus respecting the statutory minimum requirement.

Table 12 PII fixed and variable costs, and revenues

Fixed cost			
Cf1	Demolition of existing buildings	€	55,000
Cf2	Urbanisation works (public area)	€	2,094,000
Cf3	Public school construction	€	1,514,000
Cf4	Land value	€	11,500,000
Cf5	Notary and registry	€	350,000
Cf6	Financial charges (related to fixed costs)	€	1,551,300
Cft	Total fixed costs	€	17,064,300
Variable cost			
Cv1	Buildings construction	€	14,451,200
Cv2	Urbanisation work (private area)	€	1,316,000
Cv3	Technical and general costs (surveys, design, works direction, safety, testing, administrative)	€	1,806,400
Cv4	Concessions fees	€	549,000
Cv5	Financial charges (related to variable costs)	€	1,500,000
Cv6	Profit of promoter	€	2,000,000
Cvt	Total variable costs	€	21,622,600
Cvu	Unit variable costs (for sqm)		1,349
Revenues			
Rt	Revenues from sales unit (total)	€	43,686,000
Ru	Unit prices revenue (for sqm)	€	2,726

Table 13 CVPA: break-even point, total contribution margin, extra-profits and operating leverage coefficient

<i>Indicators</i>	<i>Equation</i>	<i>Unit of measure</i>	<i>Datum</i>
Break-even point (q*)	$q^* = Cf/Pu - Cvu$	Gross smq	12,394
Break-even index (Ibe)	$Ibe = q^*/ST$ (o SF)	Gross index(sm ² /sm ²)	0.70
Total contribution margin (Mct)	$Mct = (Pu - Cvu)q$	€	22,063,400
Extra-profit	$Ep = Mct - Cf$	€	4,999,100
Operating leverage coefficient	$Clo = Mct/Ep$	-	4.41

6.4 SA implementation

Before the implementation of SA, the stakeholders examined in the framework of the evaluation process were defined among classes of stakeholders, as identified in paragraph 4.1:

- 1 municipality
- 2 citizenship (random sample)
- 3 Committee of Neighbourhood Santa Croce
- 4 local entrepreneurship (representative sample).

Table 14(a) Results SA (municipality; citizenship)

	Municipality						Citizenship						Weight SA, p.b)
	VH 1.00	H 0.75	M 0.50	L 0.25	VL 0.00	Weight SA, p.b)	VH 1.00	H 0.75	M 0.50	L 0.25	VL 0.00	Weight SA, p.b)	
1	> 75	> 66	50	> 33	<= 33	18	> 72	> 60	> 50	> 34	<= 33	14	
2	< 10	< 20	< 30	< 40	>= 40	9	< 5	< 10	< 20	< 30	>= 35	7	
3	< 5	< 10	< 20	< 30	>= 30	4	< 5	< 10	< 20	< 30	>= 30	6	
4	100	< 90	< 75	< 50	>= 50	8	100	< 80	< 75	< 60	>= 60	8	
5	> 30	> 20	> 10	> 5	<= 5	3	> 25	> 18	> 8	> 5	<= 5	5	
6	< 18	< 24	< 36	< 60	>= 60	4	> 12	< 18	< 30	< 48	>= 48	7	
7	> 1	> 0.65	> 0.45	> 0.3	<= 0.3	5	> 0.6	> 0.55	> 0.48	> 0.35	<= 0.35	6	
8	> 1.5	> 0.8	> 0.6	> 0.45	<= 0.45	3	> 1.25	> 0.94	> 0.58	> 0.40	<= 0.40	2	
9	SC	C	Q	N	N	3	SC	C	Q	N	N	4	
10	< 5	< 15	< 25	< 30	>= 30	8	0	< 5	< 12	< 15	>= 15	7	
11	0	1	2	4	> 4	5	0	0	1	2	> 2	8	
12	0	-	-	1	> 1	4	0	-	-	-	> 0	5	
13	C(P; 1)	-	C(P)	-	NC	7	C(P; 1)	-	C(P)	-	NC	3	
14	> 30	> 24	>= 18	-	< 18	6	> 52	> 38	> 24	>= 18	< 18	7	
15	< 40	< 30	< 20	< 15	>= 15	6	< 46	< 29	< 14	< 10	>= 10	7	
16	> 20	> 14	> 10	> 5	<= 5	2	> 21	> 16	> 11	> 6	<= 6	2	
17	T	-	P	-	N	5	T	-	P	-	N	2	

It, for coefficients assignment

Table 14(b) Results SA (Committee of Neighbourhood; Local Entrepreneurship)

SC	Municipality						Citizenship						Weight SA, p.b)	
	VH 1.00	Coefficients (SA, p.a)			VL 0.00	L 0.25	VH 1.00	Coefficients (SA, p.a)			L 0.25	VL 0.00		
		H 0.75	M 0.50	M 0.50				H 0.75	M 0.50					
		<i>It for coefficients assignment</i>						<i>It for coefficients assignment</i>						
1	> 71	> 58	53	< 34	< 34	-	> 30	< 50	> 51	-	> 18			
2	< 8	< 15	< 23	< 31	> 31	> 24	> 30	> 20	> 11	< 10	4			
3	< 5	< 10	< 20	< 30	> 30	< 10	< 5	< 20	< 30	> 31	8			
4	100	< 80	< 75	< 60	> 60	< 60	< 50	< 75	< 90	> 91	6			
5	> 25	> 17	> 9	> 5	< 5	> 20	> 25	> 10	> 5	< 5	2			
6	< 12	< 18	< 30	< 54	> 54	< 24	< 18	< 30	< 48	> 49	7			
7	> 0.7	> 0.56	> 0.49	> 0.34	< 0.34	> 0.75	> 1.10	> 0.56	> 0.4	< 0.39	6			
8	> 1.32	> 0.99	> 0.55	> 0.41	< 0.41	> 0.9	> 1.6	> 0.6	> 0.45	< 0.45	4			
9	SC	C	Q	N	N	C	SC	Q	N	N	5			
10	0	< 3	< 9	< 12	> 12	< 20	< 10	< 28	< 37	> 38	6			
11	0	0	1	2	> 2	0	0	1	2	> 2	7			
12	0	-	-	-	> 0	-	0	-	-	> 0	5			
13	C(P; I)	-	C(P)	-	NC	-	C(P; I)	C(P)	-	NC	6			
14	> 45	> 30	> 18	-	< 18	-	> 18	-	< 17	-	5			
15	< 45	< 28	< 15	< 13	> 13	> 28	> 36	> 20	> 15	> 14	5			
16	> 22	> 18	> 11	> 5	< 6	> 18	> 20	> 13	> 8	< 7	2			
17	T	-	P	-	N	-	T	P	-	N	4			

Table 15 EM (with impacts and coefficients)

SC	Impact	Municipality		Citizenship		Committee of Neighbourhood Santa Croce		Local entrepreneurship	
		Judgement	Coeff.	Judgement	Coeff.	Judgement	Coeff.	Judgement	Coeff.
1	50.00%	M	0.50	M	0.50	L	0.25	M	0.50
2	29.30%	M	0.50	L	0.25	L	0.25	VH	1.00
3	4.41	VH	1.00	VH	1.00	VH	1.00	VH	1.00
4	100.00%	VH	1.00	VH	1.00	VH	1.00	VL	0.00
5	30	VH	1.00	VH	1.00	VH	1.00	VH	1.00
6	60	L	0.25	VL	0.00	VL	0.00	VL	0.00
7	0.69%	H	0.75	VH	1.00	H	0.75	H	0.75
8	2.11%	VH	1.00	VH	1.00	VH	1.00	VH	1.00
9	0.50	H	0.75	H	0.75	H	0.75	H	0.75
10	0.00%	VH	1.00	VH	1.00	VH	1.00	VH	1.00
11	1.00	H	0.75	M	0.50	M	0.50	M	0.50
12	0.00	VH	1.00	VH	1.00	VH	1.00	VH	1.00
13	C(P; I)	V	1.00	VH	1.00	VH	1.00	VH	1.00
14	24.40	H	0.75	M	0.50	M	0.50	VH	1.00
15	21.90%	M	0.50	M	0.50	M	0.50	M	0.50
16	20.51%	VH	1.00	H	0.75	H	0.75	VH	1.00
17	T	VH	1.00	VH	1.00	VH	1.00	VH	1.00

Table 16 EM (with weighted coefficients and appraisal scores)

SC	Municipality			Citizenship			Committee of neighbourhood Santa Croce			Local entrepreneurship		
	Weight	Coeff.	Weighted coeff.	Weight	Coeff.	Weighted coeff.	Weight	Coeff.	Weighted coeff.	Weight	Coeff.	Weighted coeff.
1	18	0.50	9.00	14	0.50	7.00	12	0.25	3.00	18	0.50	9.00
2	9	0.50	4.50	7	0.25	1.75	10	0.25	2.50	4	1.00	4.00
3	4	1.00	4.00	6	1.00	6.00	2	1.00	2.00	8	1.00	8.00
4	8	1.00	8.00	8	1.00	8.00	8	1.00	8.00	6	0.00	0.00
5	3	1.00	3.00	5	1.00	5.00	4	1.00	4.00	2	1.00	2.00
6	4	0.25	1.00	7	0.00	0.00	6	0.00	0.00	7	0.00	0.00
7	5	0.75	3.75	6	1.00	6.00	5	0.75	3.75	6	0.75	4.50
8	3	1.00	3.00	2	1.00	2.00	3	1.00	3.00	4	1.00	4.00
9	3	0.75	2.25	4	0.75	3.00	3	0.75	2.25	5	0.75	3.75
10	8	1.00	8.00	7	1.00	7.00	5	1.00	5.00	6	1.00	6.00
11	5	0.75	3.75	8	0.50	4.00	4	0.50	2.00	7	0.50	3.50
12	4	1.00	4.00	5	1.00	5.00	2	1.00	2.00	5	1.00	5.00
13	7	1.00	7.00	3	1.00	3.00	4	1.00	4.00	6	1.00	6.00
14	6	0.75	4.50	7	0.50	3.50	10	0.50	5.00	5	1.00	5.00
15	6	0.50	3.00	7	0.50	3.50	10	0.50	5.00	5	0.50	2.50
16	2	1.00	2.00	2	0.75	1.50	6	0.75	4.50	2	1.00	2.00
17	5	1.00	5.00	2	1.00	2.00	6	1.00	6.00	4	1.00	4.00
AS	100	-	75.75	100	-	68.25	100	-	62.00	100	-	69.25

Table 17 Synthesis judgements

Level of public interest	Classification threshold		Appraisal score (AS)				
	Upper	Lower	Municipality	Citizenship	Committee of Neighbourhood Santa Core	Local entrepreneurs	All stakeholders categories
Very high	100	7.6	75.75	68.25	62.00	69.25	69.25
High	87.5	62.6	High	High	Medium	High	high
Medium	62.5	37.6					
Low	37.5	12.6					
Very low	12.5	0					

The SA was implemented by providing two questionnaires to be submitted to the individuals that need to be interviewed (and subsequently interviewed). As already mentioned in paragraph 5.5, the SA is aimed to define for each sub-criterion:

- the coefficients to be applied for the transformation of impacts matrix in coefficients matrix (SA point a)
- the weights of the sub-criteria (SA point b).

The questionnaires were filled by interviewing 25 individuals¹⁰: eight individuals representatives of municipality; six individuals representatives of random sample of citizenship; five individuals representatives of the Committee of Neighbourhood Santa Croce; six individuals representatives of local entrepreneurship.

The data collected in the questionnaires were processed in order to define overall the results for each category of stakeholders [Tables 14(a) and 14(b)].

6.5 *Construction of an EM*

The data obtained through the implementation of the CVPA as well as derived from the analysis of documents related to the PII (where necessary properly processed), were used to fill up the impact matrix; subsequently the impact matrix was converted in the coefficient matrix using the data obtained in point a of the SA (Table 15).

6.6 *Weights assignment to the EM sub-criteria*

The assignments of weights to the coefficients of the EM was made using the results of SA point b; Table 16 highlights as the sets of assigned weights and the four different categories of stakeholders interviewed are different from each other; this means different attribution of importance to the sub-criteria of evaluation, compared to the four categories of stakeholders.

Then, the coefficients of the EM were multiplied by the respective weight thus obtaining a weighted coefficient (Table 16).

6.7 *Aggregation of weighted coefficients for the determination of appraisal score*

The aggregation of the weighted coefficients, through their summation, determines an appraisal score (AS) for each category of stakeholders (Table 16).

6.8 *Aggregation of judgements for the determination of appraisal score*

As it provided in the proposed evaluation procedure, through logic functions, the appraisal scores were linked with the categories related to the level of public interest.

It was finally calculated the average appraisal score referred to all categories of stakeholders involved in decision making process (Table 17).

Because the evaluation interested only one single proposal of intervention, the definition of the ranking has not been provided.

For the categories of stakeholders municipality, citizenship and local entrepreneurship, the level of public interest of PII Santa Croce is 'high' satisfaction; for

the Committee of Neighbourhood Santa Croce the level of public interest of PII Santa Croce is 'medium'.

In summary, the global level of public interest of the initiative is 'high'.

The initiative PII Santa Croce, therefore, complies with the requirements of Article 16 subparagraph 4 letter d-ter) of Presidential Decree n. 380/2001 and it has an 'high' public interest; therefore the initiative deserved to be adopted/approved, and it can be proceed in its implementation without any changes.

7 Conclusions

The MU in its territorial government activities may use the PPPN, where discretionally can accept initiatives involving variant to GUP even on private proposal, only if it is proven the presence of public interest that, according to the current legislation, corresponds with the extraordinary contribution of urbanisation.

In the current historical context, the programming and implementation of PPPN initiatives for a municipality is mainly aimed to the acquisition of public works for MU without having to bear the cost of construction; the procedure is proposed to overcome this 'opportunistic' approach recovering the European community principles and case law (on PPP itself as well as on urban transformation) through which can be seen as the result of the entire cycle-life project is closely related to the impacts (positive and negative) that can be generated; according to this approach, none of the components on which a project produces impacts (financial, procedural, socio-economic, environmental, technical) it must not be overlooked.

The development process, which provides a new operating declination of WSM with the use of MCDA and SA, makes it possible to appraise the public interest considering all the – listed – components on which depends, briefly, the quality of a PPPN intervention. Through the CVPA it is possible to determine, in a more balanced way, the aspects related to the determination of the extraordinary contribution, from which also depend the quality of urban settlement. With the SA, instead, expectations, opinions, interests of stakeholders become the focal point for the evaluation.

Thereby a municipality may authorise PPPN initiatives, not only verifying the extraordinary contribution according to art. 16 subparagraph 4 letter d-ter) of Presidential Decree n. 380/2001, but also considering the public interest as a result of PPPN and in full awareness of the level of satisfaction that the same public interest generates in those who will benefit from the initiative, necessary and unavoidable condition for authorising a PPPN.

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References

- AA.VV. (2016) Rapporto sulla stabilità finanziaria n. 1/2016, Banca d'Italia, Roma ISSN pp.2280–7608.
- De Mare, G., Granata, M.F. and Nesticò, A. (2015) 'Weak and strong compensation for the prioritization of public investments: multidimensional analysis for pools', *Sustainability*, MDPI AG, Basel, Switzerland, Vol. 7, No. 12, pp.16022–16038, ISSN: 2071-1050, DOI: 10.3390/su71215798.
- European Central Bank (2014) *Asset Quality Review*, Phase 2 Manual, ISBN 978-92-899-1254-9 [online] <https://www.bankingsupervision.europa.eu/ecb/pub/pdf/assetqualityreviewphase2manual201403en.pdf> (accessed 31 May 2017).
- European Commission (2006) 'Evaluation methods for the European union's external assistance', *Evaluation Tool*, Vol. 4 [online] http://www.ec.europa.eu/europeaid/sites/devco/files/evaluation-methods-guidance-vol4_en.pdf (accessed 31 May 2017).
- European Commission (2014) *Guide to Cost-Benefit Analysis of Investment Projects* [online] http://www.ec.europa.eu/regional_policy/sources/docgener/studies/pdf/cba_guide.pdf (accessed 31 May 2017).
- Figueira, J., Greco, S. and Ehrgott, M. (2005) *Multiple Criteria Decision Analysis: The State of the Art Surveys*, Springer Science Business Media, New York.
- Guarini, M.R. and Battisti, F. (2014) 'Benchmarking multi-criteria evaluation methodology's application for the definition of benchmarks in a negotiation-type public-private partnership, a case of study: the integrated action programmes of the lazio region', in: *International Journal of Business Intelligence and Data Mining*, Inderscience Enterprises Ltd., Vol. 9, No. 4, pp.271–317, ISSN online: 1743-8195, ISSN print: 1743-8187; DOI: 10.1504/IJBIDM.2014.068456.
- Guarini, M.R., Buccarini, C. and Battisti, F. (2015) 'Proposta per l'utilizzo di un nuovo modello di analisi multicriteriale per scegliere l'offerta economicamente più vantaggiosa nei contratti di appalto dei lavori pubblici', in Fattinanzi, E. and Mondini G. (Eds) (a cura di): *L'Analisi Multicriteri tra valutazione e decisione, DEI*, pp.357–368, ISBN 9788849644319.
- Hwang, C.K. and Yoon, K. (1981) *Multiple Attribute Decision Making: Methods and Applications*, Heidelberg Springer, New York.
- Ishizaka, A. and Nemery, P. (2013) 'Multi-criteria decision analysis', *Methods and Software*, John Wiley & Sons Ltd., The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK. ISBN: 978-1-119-97407-9.
- Korhonen, P., Moskowitz, H. and Wallenius J. (1992) 'Multiple criteria decision support – a review', *European Journal of Operational Research*, Vol. 63, No. 3, pp.361–375.
- Morano, P. (2007) *La stima degli indici di urbanizzazione nella perequazione urbanistica*, Alinea, Firenze.
- Morano, P. and Tajani, F. (2017) 'The break-even analysis applied to urban renewal investments: a model to evaluate the share of social housing financially sustainable for private investors', in *Habitat International*, Vol. 59, pp.10–20, ISSN: 0197-3975 [online] <http://www.dx.doi.org/10.1016/j.habitatint.2016.11.004> (accessed 31 May 2017).
- Nesticò, A., Macchiaroli, M. and Pipolo, O. (2015) 'Costs and benefits in the recovery of historic buildings: the application of an economic model', *Sustainability*, MDPI AG, Basel, Switzerland, Vol. 7, No. 11, pp.14661–14676, ISSN: 2071-1050, DOI: 10.3390/su71114661.
- Nijkamp, P., Rietveld, P. and Voogd H. (1990) *Multicriteria Evaluation in Physical Planning*, North Holland Publ., Amsterdam/New York.
- Roy, B. (2013) *Multicriteria Methodology for Decision Aiding*, Vol. 12, Springer Science & Business Media, Berlin, Germany.

Notes

- 1 Art. 2 Law no. 179/1992 'Programmi Integrati di Intervento', art. 16 Law no. 179/2012 'Programmi di riqualificazione urbana', art. 11 Law no. 493/1993 'Programmi di Recupero Urbano', detailed, over the years, with appropriate Regional Laws.
- 2 GUP is a tool for the general programming/planning at a municipal level; its elaboration and general-and-accurate change were, until that moment, an exclusively public expertise, non-negotiable with private entities.
- 3 This is what Article 16, sub-paragraph 1, D.P.R. 380/2001 says: 'L'incidenza degli oneri di urbanizzazione primaria e secondaria è stabilita con deliberazione del consiglio comunale in base alle tabelle parametriche che la regione definisce per classi di comuni in relazione: lett. d-ter) 'alla valutazione del maggior valore generato da interventi su aree o immobili in variante urbanistica, in deroga o con cambio di destinazione d'uso. Tale maggior valore, calcolato dall'amministrazione comunale, viene suddiviso in misura non inferiore al 50% tra il comune e la parte privata e da quest'ultima versato al comune stesso sotto forma di contributo straordinario, che attesta l'interesse pubblico vincolato a specifico centro di costo per la realizzazione di opere pubbliche e servizi da realizzare nel contesto in cui ricade l'intervento, cessione di aree o immobili da destinare a servizi di pubblica utilità, edilizia residenziale sociale od opere pubbliche'.
- 4 Even without specific legislative guidelines, over the years it became an habit for the AC to as a public interest the initiatives wherein it was planned the construction of public works financed by the private-entity promoter of the operation, to "offset" with building potential by derogation from the GUP, both in the indexes and in the intended uses.
- 5 The financial capital gain is generally estimated by using: $P = V_{pt} - V_{at}$ where P is the financial capital gain of the initiative; V_{pt} (post-transformation) is the TV of the real estate subject of the initiative according to the PPPN provisions, to be estimated through the analytical process of estimate of the TV; v_{at} (ante-transformation) is the TV of the real estate subject of the initiative according to the provisions which preceded the PPPN.
- 6 European Central Bank (2014, p.147): "hope value refers to potential increase in value achieved through investing in improving the aspect of a property e.g. completing development of partially completed office building."
- 7 The fixed costs are connected with the presence, in the framework of the productive process, of fixed factors of production acquisition of the buildable area, registration tax and notary fees related to the purchase, potential demolition of the existing volumes on the buildable area and soils adaptations, arrangement of the outdoor area (internal roads, private parking lots, green maintenance), primary urbanisation system, their technical and administrative expenses, financial charges.
- 8 The initiative variable costs are associated with the factors of production available to a variable extent in the productive process and dependent on the volume of production building construction, cost of primary, secondary and extraordinary urbanisation (if not deducted for building constructions) their technical and administrative expenses, financial charges, the entrepreneur's ordinary profit.
- 9 These models are acknowledged under the Italian law; D.Lgs. 50/2016 (as well as D.Lgs. 163/2006 before) and D.P.R. 207/2010 require to employment of a MCDA model chosen by the contracting authority in order to sort the different offers for awarding the public works contracts by using the most economically advantageous offers criterium.
- 10 The stakeholders analysis has been implemented at the headquarters of the Municipal Administration of Mentana, interviewing subjects (belonging to different categories of stakeholders) who went at the same venue during a discussion meeting about the new municipal urban planning general.