Post-seismic Reconstruction Planning. A Space-Time Scheduling Multi-prospects Model

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Abstract. The post-earthquake reconstruction of the small-town centers included in the "seismic crater" of Abruzzo (Italy) in 2009, affected by one of the most serious natural disaster in the recent Italian history, was managed through various phases, involving the typical cognitive, evaluative and decision-making functions of appraisal and valuation. This paper presents the latter, which deals with the planning of the reconstruction works, a decision-making process that involves the whole cognitive spectrum of the ontology, epistemology and praxeology of the human, urban and social capital. With reference to the case study of a small-town center, the proposed space-time multi-prospect model is structured in two different approaches: the first, static, takes into account the attributes as defined upstream; the second, dynamic, takes into account the changing conditions that occur year after year as the reconstruction progresses, changing the topography of the attractors. In the planning phase, the value of the spatial characteristics of the individual units targeted for funding was identified and characterised; in the concertation phase, the building aggregates worthy of intervention were identified and mapped; in the decision phase, the preference system was redefined by creating multiple scenarios with a view to the final optimisation of the public funding programme.

Keywords: Value-based planning · Disaster proactive vs reactive policies · Scenarios generation

1 Introduction

1.1 Framework

This paper frames within the whole spectrum of the Appraisal and Valuation discipline, implying a specific civic engagement in the reform of the home-city-landscape system [1]. This implication concerns the original reference of value and valuation science (once Appraisal) to issues of distributive justice.

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Among the many operational areas of distributive justice – in particular spatial – the balance between proactive and reactive approaches in territorial risk prevention policies [2–4] includes all the most important and urgent aspects of the dialectic between citizen and *res publica*: the relationship between individual and community, state and market, home and city, city and territory, wealth and value, converging towards the land-economic general category of human-urban capital [5].

The Italian legal system guarantees reconstruction with public funds in the event of an earthquake, while leaving prevention choices and decisions to local authorities and households. For this reason, the insurance sector in Italy has a weak presence in the field of protection against natural disasters and, in particular, against earthquake risk [6].

Recently, as part of the post pandemic "National Recovery and Resilience Plan" (NRRP) [7], the Italian government has guaranteed a substantial set of measures to support quality costruction, in particular seismic and energy retrofitting, but nevertheless on a voluntary basis and therefore without coordination at the urban or neighbourhood level. As a result, there is still a high level of vulnerability at the territorial level of the built heritage exposed to seismic risk.

This paper presents a study case of reactive policy, in particular a value-based multi-prospects programming model for the post-seismic reconstruction process over experienced in one of the small-town centres [8] included in the wide seismic crater as a consequence of the Abruzzo earthquake of 6 April 2009.

This disaster dictated the establishment of a massive administrative machinery to oversee all the phases of reconstruction, from the typically cognitive ones, i.e. the identification of information units (building aggregates and building units) evaluation, damage classes and parametric reconstruction costs, to the decision-making ones, such as the drawing up the reconstruction timetable, all with the aim of ensuring that public fund do not exceed what is due, thus guaranteeing the balance between the (dis-)value of the damage and the value of the public resources allocated to its compensation.

This correspondence between the value of the damage and the value of the public funding (the latter to be taken as the social opportunity cost) is to be related to the original principle of welfare economics, which implies the internalization of the externalities, which we interpret and propose as a prospect of solidarity based on the value of merit.

Accordingly, the governance of reconstruction has always been aimed at ensuring a fair distribution of funds based on a rigorous assessment of the funding merits of reconstruction works.

1.2 Contents and Aims

Based on the two main contents of the reconstruction plans – the valuation of the reconstruction costs and the timetable – the paper aims to provide a model for the space-time allocation of public funds for the Reconstruction Plan of the Municipality of Fossa (Italy) (Fig. 1), one of the most relevant small-town centres of the seismic crater from the urban, architectural, historic, anthropological and landscape point of view.

The paper presents the main conceptual issues of the creation of the model across the three main cognitive functions, analysis, evaluation and project, and some of its possible applications. Analysis aims at setting the information system at the two levels of Building Units (BUs) and Building Aggregates (BAs). Valuation defines the four axiological

perspectives, the value functions and the weighting systems related to different socio-economic prospects, and sets up the static and dynamic approaches. The project includes the programming functions, which outline multiple scenarios each related to a different socio-economic perspective.

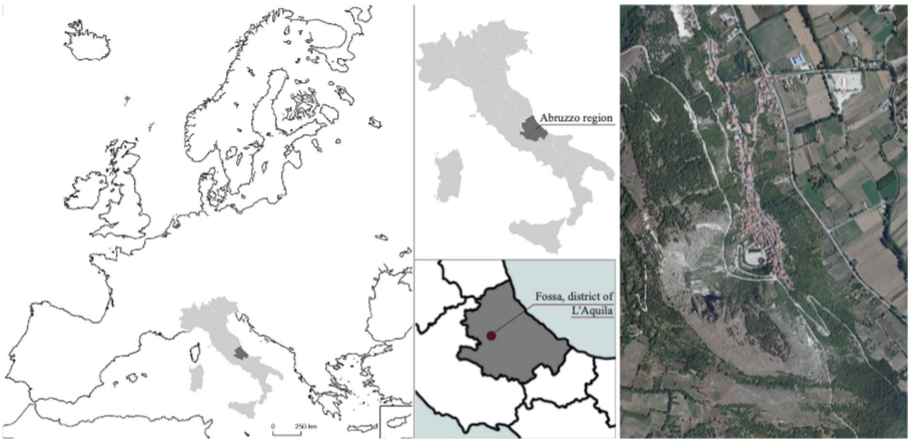


Fig. 1. Geographical outline and orthophoto of Fossa small-town centre.

The paper is divided into five parts. Section 2 (Materials) summarizes the territorial and administrative background ruling the Reconstruction Plans drafting and a short description of the study case. Section 3 (Methods) presents the multi-perspective space-time scheduling model for the equitable allocation of the reconstruction fund. Section 4 (Application) presents and describes the results of the experiment according to the different scenario hypotheses. Section 5 (Discussions and conclusions) presents some critical considerations about the many epistemological and axiological oppositions that characterize the many issues of the community security management.

2 Materials

The Abruzzo earthquake of 6 April 2009 affected an area, the seismic crater, of 2387 km^2, comprising 56 municipalities and the regional capital, L'Aquila, involving 67,000 inhabitants, who were initially housed in temporary accommodation and hotels, and then in two types of residential complexes, the Provisional Housing Modules (PHM) and the Sustainable and Environmentallly Friendly Earthquak Resistant Complexes (SEEC). Due to the enormous economic commitment required for their construction, they have become a medium to long-term locational prospect, such as new territorial poles that have changed the planning of the territorial structure.

The financing of reconstruction involves an imposing administrative machinery, which is called upon to coordinate all levels of the process in order to implement the progressive and joint legislative action of the national and regional governments, represented by the Prime Minister and the Deputy Commissioner for Reconstruction, the President of the Region.

The various Ordinances of the Italian Prime Minister (OPM) have regulated the eligibility for compensation (classification of the state of damage on the basis of usability) also based on the rights for first and second homes (OPM 3779/2009), actions directly or indirectly related to earthquake damage, reconstruction works and socio-economic development, also specifying the limits of the exceptions to the principle of compensation in a specific form (transfer of buildings and relocation), the conditions and contribution limits for the less severe (A) individual and aggregate (OPM 3820/2009) and more severe (E) classes of usability (OPM 3778, 3779 and 3790/2009 and 3881/2010), the increase in the parametric costs for buildings of architectural value and listed buildings (OPM 3917/2010) etc., with the general intention of protecting and qualifying public expenditure.

Implicitly, the Technical Mission Structure was intended to limit the excesses of that "disaster economy" which, in an exceptional situation is inevitably triggered by the convergence of the contingent emergency and the prospective huge flow of money which the various professions, companies, and local administrations rush to capture for purposes linked to both personal interest and to collective value, not always convergent and harmonious.

The Decrees of the Delegate Commissioner for Reconstruction [9] have regulated the path of eligibility for funding:

- by introducing the Reconstruction Plans (Decree-Law 39/2009), which aim to implement the contextuality and processuality of reconstruction;
- by indicating the modalities of the perimeter (Decree-Law 3/2010);
- by distinguishing homogeneous areas and buildings to be recognised as recipients of systematic and integrated works, coordinated by Consortia.

The very intention was to adapt the principle of individual compensation to the legal-administrative realities resulting from the combination of settlement characteristics and construction aspects; consequently, the delimited areas are divided into areas within which the building aggregates to be supported are identified.

From the outset, the government, which was very concerned about the fairness of compensation, the efficiency of public spending and the transparency of the procedures, focused on programming in the crater area with the publication of the State of Implementation and Programming, which allocated to each of the 20 municipalities, out of a total of 56 that had adopted the Reconstruction Plans (RPs) at that time, a variable share of the funds indicated in the corresponding Technical and Economic Frameworks (TEFs). The priorities depended on the number of main dwellings and aggregates including main dwellings, and on the number of social housing units and monuments.

Now, while the drafting of the TEF was defined by the regional technical bodies in such a way as to allow the funds to be distributed among the municipalities according to their real needs, the drafting of the Timetable was not complemented by rules for measuring and comparing the values of social, urban, cultural and economic capital in order to be able to define preferences and priorities [10] among the different shapes of salience and urgence.

This contribution aims to bridge the gap between shared awareness and top-down decisions in the formation of a Timetable for post-earthquake reconstruction, based on

the integration of saliencies and urgencies through a value-based programming model developed within a Web-GIS modelling environment.

3 Method

3.1 Approach and Axiological Coordinates

The Timetable is a planning document that defines the space-time allocation of funds between the different eligible parties: Consortia (BAs), condominiums (BUs including different properties), homeowners (mono-property buildings) (BAs in the three cases).

A MAVT-based approach allows the ranking of the BAs according to their attitude toward financing; the generation of multiple scenarios and their evaluation on the basis of four axiological matrices allows the maximisation a multi-prospect function.

Making criteria and their comparative importance explicit makes it possible to compare different strategies for supporting participatory decision-making. This dialogical support makes it possible to limit discretion by specifying the fraction of it that cannot be axotomized, in particuar with regard to the following elements:

- *steps*, i.e. the stages of the decision-making process in which discretion is concentrated, including the choice of criteria, the weighting system and the value functions; in particular, in order to satisfy certain explicit requests from the administration, the model allows each of the criteria to be assigned a dominant position and the related value functions a specific score range depending on whether that criterion is dominant (i.e. it must be satisfied first) or semi-dominant (i.e. whether the BAs that best meet this criterion are favoured to a certain extent) [11];
- *breadth* of the sphere of actors exercising this discretion, and thus of the sphere of interlocution; the value-based participatory model [12] is supported by a WebGIS interface [13] that allows accredited actors to implement the parameters that correspond to their specific axiological profile and to visualise the corresponding spatio-temporal funding plans in real time;
- *destination*, i.e. the subjects and objects on which discretion has the greatest effect; given the vagueness of the rules and procedures, these effects concern the local responsibility and the search of consensus, rather than the possibility of affirming shared values in the wider context of the crater.

The approach is based on two distinct and converging cognitive functions: 1. The evaluation (static and dynamic) of BAs; 2. The programming of reconstruction interventions. These two levels of evaluation refer to general criteria of fairness, effectiveness, economy and efficiency.

- *Fairness.* This is the socio-economic criterion that refers to the primary objective of reconstruction, which is the return of primary dwellings to displaced persons housed in temporary shelters. This criterion priotitizes: 1. The Bas with a higher percentage volume of primary dwellings; 2. The strategies that envisage a shorter time for the completion of the reconstruction of primary dwellings.
- *Effectiveness.* This criterion concerns the possibility of reactivating strategic (central) urban contexts first; it gives priority to: 1. The BAs closest to the areas with the highest

density of functional and symbolic value; 2. The average completion time of central building reconstruction.
– *Cost-effectiveness.* The built-urban heritage is characterised by different attributes of real estate value [14]; the first two criteria cannot take this into account, nor can the principles of compensation go out of their way to privilege a predominantly private patrimonial dimension: 1. Preference will be given to BAs characterised by the features usually most valued by the real estate market; 2. The strategy that concentrates in the first years the buildings that express the greatest share of this value overall will be valued.
– *Efficiency.* As a ratio of outcome to cost, preference will be given to: 1. The least damaged BAs; 2. Strategies that will concentrate the reconstruction of the least costly AEs in the early years.

3.2 The Model. Valuation and Decision-Making Pathways

The cognitive and operational path leading to the best organisation of the Reconstruction Plan [15] is a decision-making process in which Analysis, Evaluation and Project overlap and merge. Figure 2 shows the three cognitive functions and domains, marked with different colours.

Analysis: provides a discrete representation of the urban fabric, first through Building Units that are identified and characterized according to a standard lexicon associated to Building Urban, Economic and Social value attributes.

Evaluation:

– on a building scale ("House matters!"), a preference system [16] stemming from a predominantly individual axiology, transforms observations into valuations that define Saliences and Urgencies; this transformation allows the attributes of the BUs to be projected onto the BA scale; the BA is now the minimum information/value-bearer unit, as well as the urban elementary unit whose Aptitude to be financed is defined in terms of Weighted Average Scores (WAS) using the MAVT-based decision-making model;
– on an urban scale ("Citizenship matters!") the Community's ethical prospects project the BAs Aptitudes towards the dimensions of Space (Saliences) and Time (Urgencies).

Project:

– in the Space dimension at the level of the BAs Aptitudes the programming functions generate a set of Strategies (reconstruction layouts) each of which represents a different preference system defined by a different weighting system: fairness-effectiveness/efficiency-cost-effectiveness;
– in the Time dimension the model adapts itself by changing some of the rules of the valuation model from year to year, making decisions dynamic.

As summarised above, the model consists of:

1. two evaluation paths which aim to outline as many rankings of BAs as there are strategies to be implemented. These rankings can be established according to:

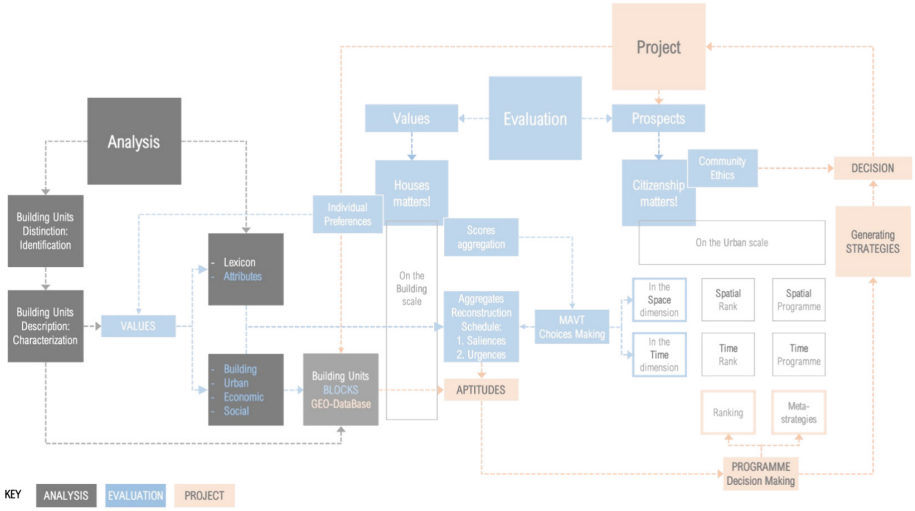


Fig. 2. Conceptual map of the cognitive-operational pathway of the reconstruction Timetable.

a. a static evaluation path;
b. a dynamic evaluation path;

2. two programming levels:
   a. the choices level, which is aimed at the BAs and therefore at their ranking in relation to the two paths and each strategy;
   b. the decision level, aimed at the strategies, developing on a meta-strategic level.

3.3 Valuation Pathway. Static and Dynamic Assessments

The aim of these assessments is to characterise BAs in order to determine their eligibility for funding.

Static Valuation. It assumes that axiological semantics – I.E. The rules by which the preference attribute is associated with the value-bearer – are invariant throughout the reconstruction process. The problem of the best allocation of the annual reconstruction budget is approached by maximising a multi-attribute function [17]. The BAs that rank highest in terms of funding merit are selected until the budget is exhausted; the remainder is added to the following year's budget.

The ranking position of the i_{th} BA depends on the score $S_i = \overrightarrow{s_{hi}}\,\overrightarrow{\lambda}$, where $\overrightarrow{s_{hi}}$ is the vector of the $h = 1, 2, \ldots 4$ scores assigned to the BA from the perspective of each attribute, while $\overrightarrow{\lambda}$ is the vector of weights assigned to the attributes with the constraint that $\sum \lambda = 1$.

Since each BA is made up of m BUs with each of which is associated with a vector of four scores $\overrightarrow{u_{ki}}$, $(k = 1, 2, \ldots m)$, varying on a dimensionless scale between 0 and 2, the single s_{hi} is calculated by aggregating all the u_{hk} of the m BUs included in the BA. There are $j(1, 2, \ldots, 4)$ different ways of aggregating the m u_{hi} of the i_{th} BA:

- $s_{hi1} = \sum_k u_{hk} v_{ki} / V_i$, where v_{ki} is the volume of the k_{th} BU and V_i is the total volume of the i_{th} BA;
- $s_{hi2} = \sum_k u_{hk} \overline{V}_k$, where $\overline{V}_k = v_{ki} / \sum_i V_i$;
- $s_{hi3} = u_{hk} / m$;
- $s_{hi4} = \sum_k s_{hk} g_{ki} / G_i$, where g_{ki} is the ground area of the k_{th} BU of the i_{th} BA, and G_i is the total ground area of the BA.

The total score for each of the 72 BAs is: $\forall BA_i \in BA, \exists f_1(BA_i) = S_i; 1 \leq BA_i \leq 72; 0 \leq S_i \leq 2; f_1$ normalizes the average weighted *scores* to a 0–2 standard scale.

The reconstruction cost C_i for each BA is obtained from the TEF: $\forall BA_i \in BA, \exists f_2(A_i) = C_i; f_2$ implements the OPMs conditions [18] to calculate C_i [19].

Each weighting system generates a different ordering of the BAs, and for each annual budget W_y, $(y = 1, 2, \ldots, 6)$, a subset $D \subset AE$ is defined, where D contains the top BAs whose total cost do not exceed W_i. Correspondingly:

$$\forall W_i \exists D \subset AE : \sum_{i=1}^{m} C_i \leq W_i$$

A synopsis of the above model with reference to the BUs and BAs assessments is shown in Fig. 3.

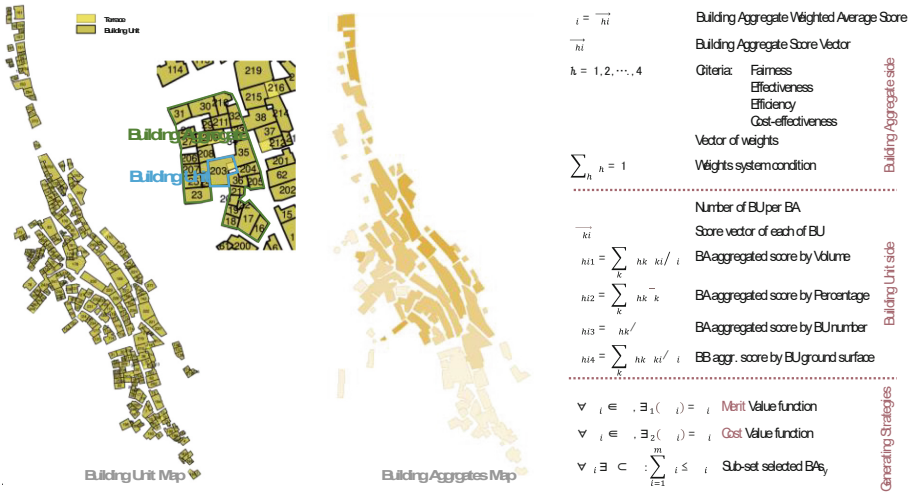


Fig. 3. Synopsis of the evaluation model for the ranking of the BAs by eligibility for funding.

Dynamic Valuation. It admits that the axiological semantics may change from year to year as reconstruction continues. This idea stems from the perception of how the wounds inflicted by the earthquake and the emergency garrisons have merged together, are established themselves as new presences that, for better or for worse, will accompany the future of these territories with new histories and new geographies. As a result of this bifurcation, reconstruction is no longer restoration, but progressive adaptation that

deviates from the natural course of events. The dialectic of principles (the values) and contingencies (changes in conditions) is the subject of the project evaluation a double awareness that enables decision-makers to act on the basis of reason and truth.

The dynamic modelling took into account the change in location attributes as the reconstruction progressed from year to year. Figure 4 shows, in a hypothetical abstract space, two rows of four rectangles whose cells symbolize the BAs in terms of Attributes and Aptitudes.

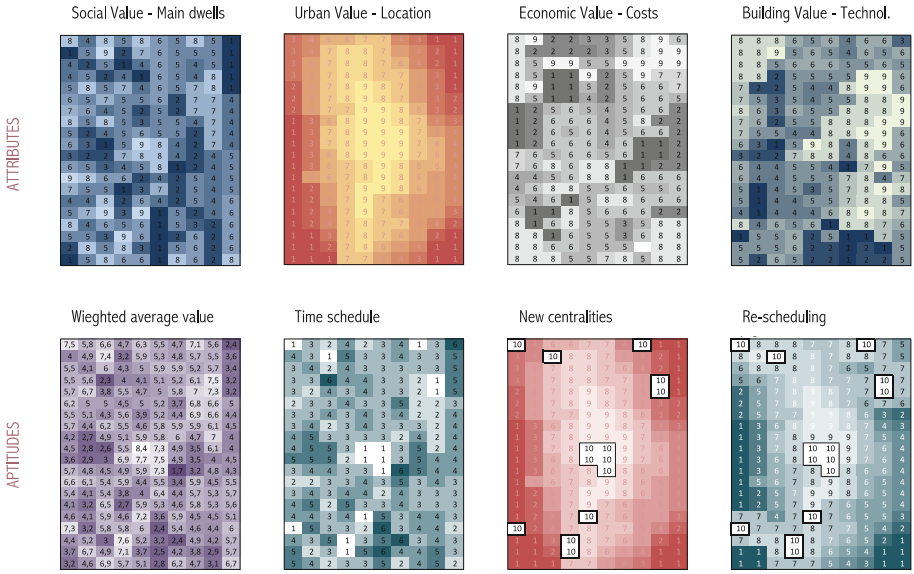


Fig. 4. Dynamic pattern for strategy oulining.

The “Attributes” rectangles – in the above line – are scored from 1, dark, to 10, light, and relate to the four criteria. In particular, the second one, “Urban Value – Location” highlights in yellow a hypothetical more valuable area, formed by a longitudinal road axis and a square in the centre. The other three, mapping Social, Economic and Building values, display the hypothetical random distribution of these values.

The “Aptitudes” rectangles – in the bottom row – display:

- the overall weighted average score;
- the timing of the intervention during the funding period (lighter green for the first years, darker for the last);
- the New centralities generated by the first-year reconstructions in relation to the scheme referable to the Urban value criterion;
- modification of the centrality attribute of all other BAs (light haloes around the BAs reconstructed in the first year) according to the reciprocal distances between them.

In the dynamic pattern, the ranking changes from year to year according to the valorization of the urban context, due to the progressive reconstruction of the BAs,

which in turn create "new centralities", thus influencing the Urban value of the closest ones. Due to the fact that the BAs that are gradually being rebuilt become attractors for the next ones, which may change places from the previous ranking: ${}^{a}S_i = \overrightarrow{s_{h'i}}\,\overrightarrow{\lambda'}$; $(a = 1, 2, \ldots, 6)$ where $\overrightarrow{s_{h'i}}$ is the new vector including the score related to the new criterion "New centralities" and $\overrightarrow{\lambda'}$ is the new weights vector; the first year score is ${}^{1}S_i = S_i$. The greater the weight associated to the new criterion the more significantly the new ranking will differ from the base ranking.

Two different types of dynamic strategy have been implemented: the first assumes that the weight of the new criterion is kept constant; the second outlines four strategies each representing a different situation of a function outlining the trade-off between the basic criteria and the new ones.

3.4 Decision-Making Pathways. The Two Levels of Programming

Programming involves two levels of decision-making:

- the first one involves the generation of internally consistent layouts, i.e. addressing the generation of strategies according to a different weighting system;
- the second one concerns the selection of the best strategy according to the second level of criteria.

Figure 5 shows the weighting systems that generate the 24 strategies: 1–6 cluster concerns the Static approach emphasising the trade-off between qualitative and quantitative criteria; the 7–15 cluster concerns the Dynamic approach 1, emphasising the same trade-off between criteria; the 16–24 cluster concerns the Dynamic approach 2 emphasising the trade-off between the static and the dynamic criteria.

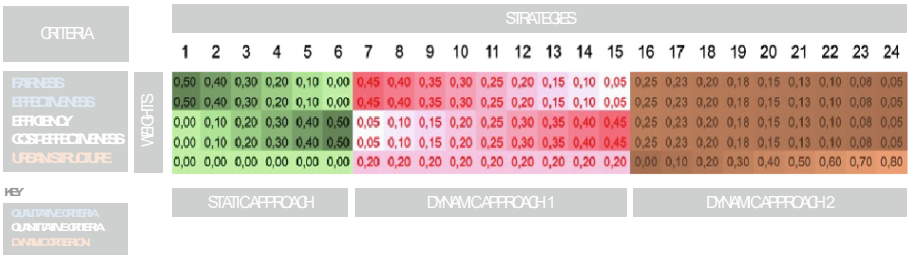


Fig. 5. Scenario generation by combining static/dynamic approaches/criteria and the associated scores by the perspectives of the different criteria.

3.5 The Timetable Web-GIS Platform

The GIS platform of the Fossa RP, in addition to containing all the information of the plan, was used to:

- the implementation on a geodatabase of data from different networked workstations operating on the same database at the same time and without conflicts;

– automate spatial calculations and eliminate errors;
– the link between the contents of the RP and the TEF;
– the spatial analysis necessary for the scoring of the different BAs;
– the dynamic formation of the sorting of the BAs on the basis of evaluations whose functions have been implemented on the same WebGIS platform.

The WebGIS interface consists of several areas (Fig. 6):

– the map and its dynamic zoom functions to adapt the dimensions of the different graphical objects to the different scale ratios; each object can be queried for its characteristics and different themes can be displayed simultaneously;
– an information area on the right-hand side where the required thematisms can be displayed on a map;
– a planning area on the left where the weights of the four criteria are entered, the way in which the AU scores are aggregated (from 1 to 4), the budget for each year, and the possible degree of dominance of each criterion.

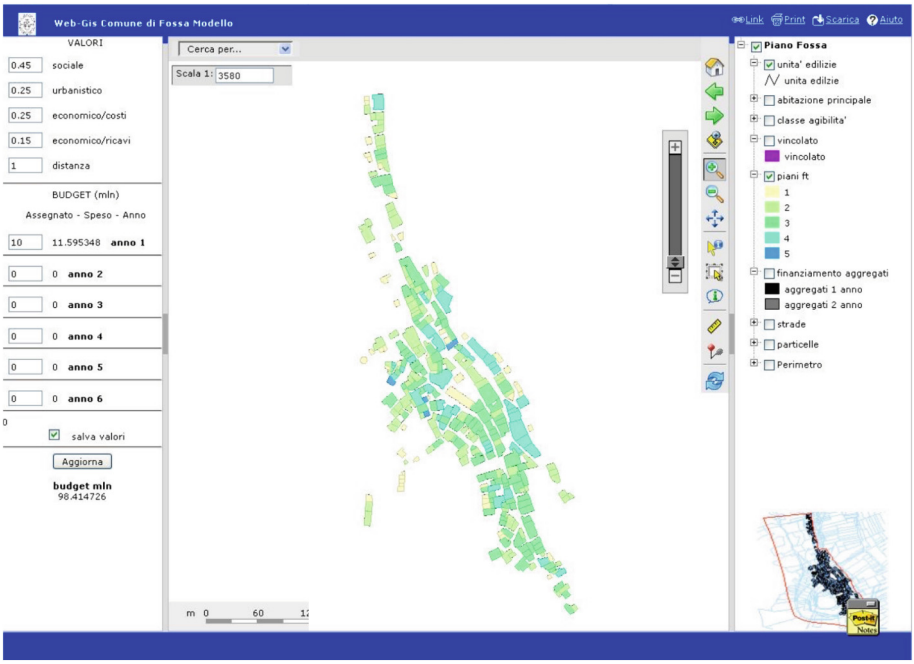


Fig. 6. The Web-GIS query-planning interface.

4 Application and Results

By implementing the parameters that generate multiple scenarios, it is possible to display and compare the six scenarios for the allocation of resources in space and time over the 6-year period envisaged according to a static approach that carries out the trade-off

between qualitative criteria (equity and effectiveness) and quantitative criteria (efficiency and cost-effectiveness) according to the weighting system of Fig. 5 (columns 1–6).

Each of the six images in Fig. 7 shows the funding space-time allocation program in two different ways: the map highlights the reconstruction stages with dark-to-light shading (first year dark blue, second year light blue, … sixth year yellow); the graph lists all the 72 Bas in the rows, and the light blue marker in the columns indicates the placement of the BAs over the 6-year funding period.

The map comparison provides useful information on the space-time placement of each BA in the reconstruction, but above all on the spatial concentration of the reconstruction sites in each year, from the point of view of the best management of the process. The table comparison, in turn, provides information about the temporal concentration of the largest number of BAs, as well as the priority of the reconstruction of each BA, the latter measured as the times in which each BA is placed in each year over the six scenarios.

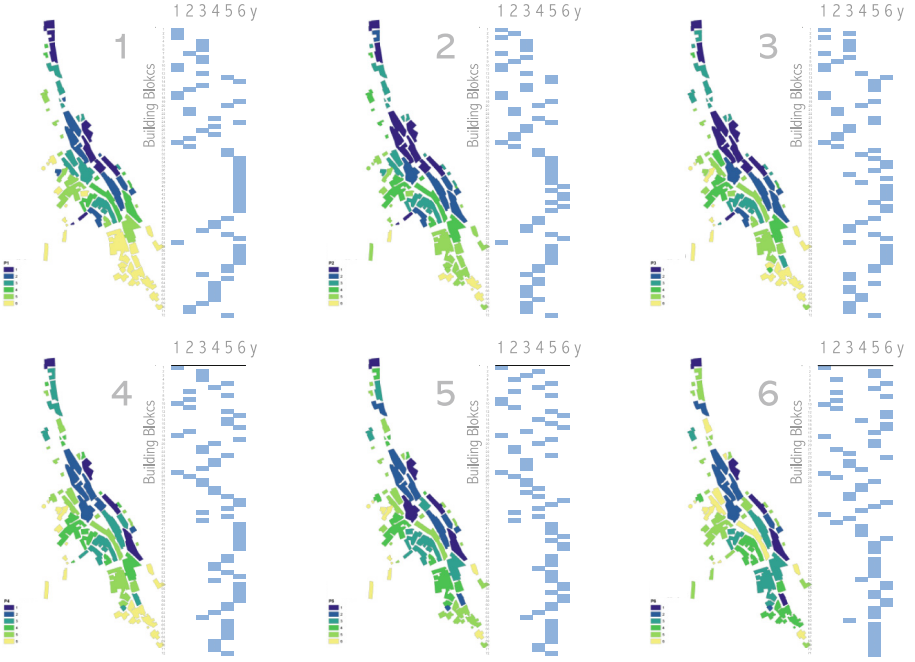


Fig. 7. Space-time funding allocation according to the static approach 1–6 strategies performing the trade-off between qualitative and quantitative criteria

The same comparison is displayed in Fig. 8 with reference to the dynamic approach and according to the hypothesis of a trade-off between qualitative and quantitative criteria (Fig. 5, columns 7–15). In the dynamic approach, the introduction of an additional criterion, "New centralities", generates three further scenarios.

Finally, Fig. 9 displays the comparison between scenarios in the dynamic approach according to the trade-off between the four original criteria and the new one concerning

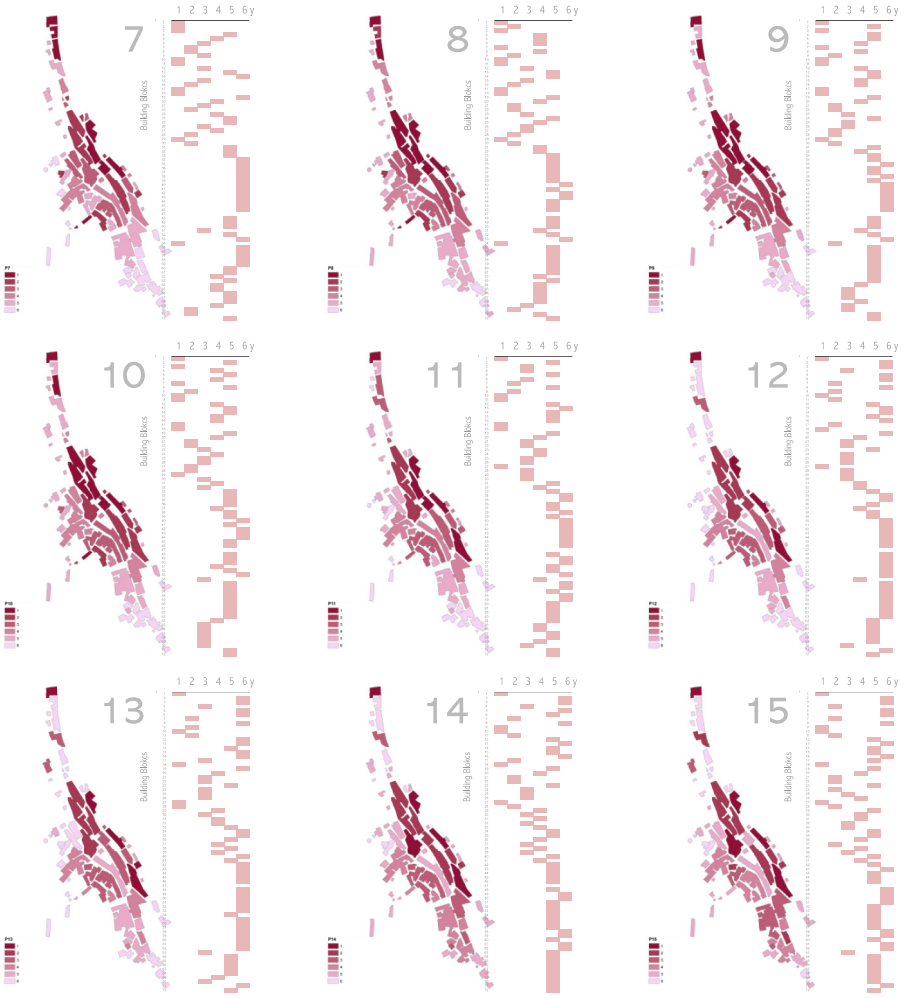


Fig. 8. Space-time allocation of resources according to nine dynamic approaches; the strategies 7–15 represent the trade-off between qualitative and quantitative criteria.

the progressive change of the location value of the BAs reconstructed year by year (Fig. 5, columns 16–24).

A whole synthetic view at the results of this space-time programming experiment allows us to recognize the overall priority that the central area deserves due to the convergence of the main value dimensions. Nevertheless, some BAs in this area are less prioritized due to the lack of main dwellings in them.

The overall results of the scenario comparison are presented in Fig. 10, which shows for each strategy (columns) the preference systems (the weights according the main general criteria and the added one), and the corresponding individual and aggregated scores, highlighting the preferred ones within each of the three approaches, Scenario

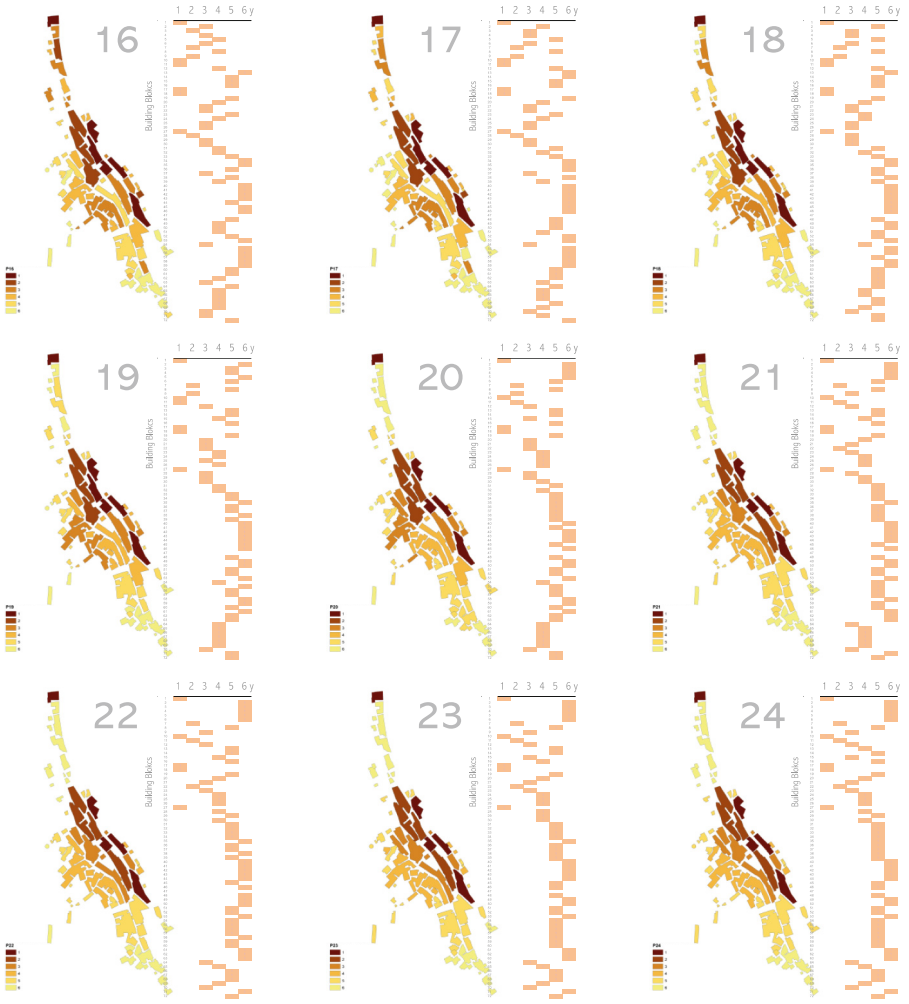


Fig. 9. Space-time allocation of resources according to nine dynamic approaches; the strategies 16–24 represent the trade-off between the four original criteria and the additional dynamic criterion.

2 in the static approach, Scenario 8 in the first dynamic approach, Scenario 16 in the second dynamic approach.

The results show the global inconsistency: the increasing weight of the New centrality criterion to the detriment of the others, as shown by the lowest and decreasing scores of the scenarios of the second dynamic approach.

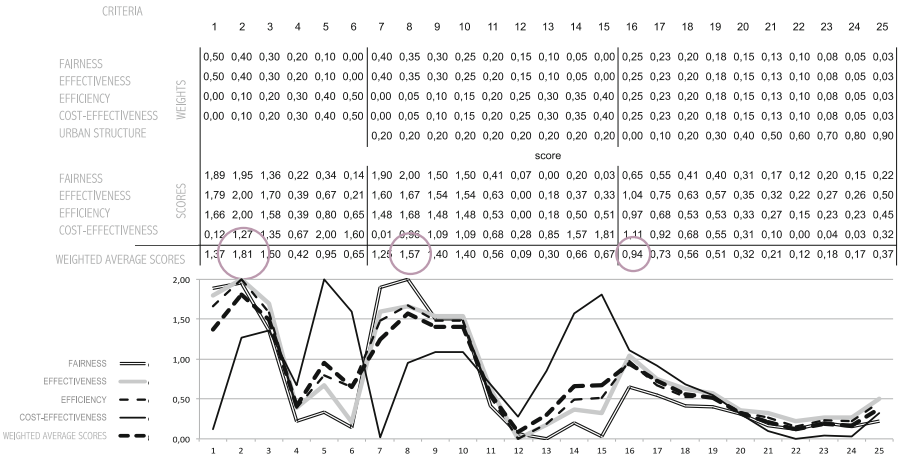


Fig. 10. Final comparison of the 24 scenarios by approaches.

5 Discussions and Conclusions

The proposed approach suggests some general and conceptual considerations concerning a science of valuation basic references.

Although the identification and, in a way, the "construction", of the best timetable seems to be the natural outcome of this heuristic experiment, the original research question of this experience doesn't concern "who is the winner".

In the decision-making approaches, the social agreement about the weights influences – and somehow constructs – the reality that fills our value judgements with truth.

In the social sciences, constructivism is a philosophical current according to which the reality of shared values is expressed in the autonomy of a self-conscious humanity to construct its own values rather than deriving them from some authority. "Constructivism has been criticised by Hayek, who sees it as a prejudice according to which the human beings who have created societies, institutions and civilisations legitimise themselves to change them at will according to their desires and aspirations. It is an attitude of those who are aware of the unintended consequences of deliberate actions and who seek a rational reconstruction of society and institutions, as is typically assumed in utopian scientism" [20].

Although this kind of reality is a social reality, it's not implicitly a "reality of values" that is the fair combination of the axiological (individual) and the ethical (collective) dimensions of value. Decision-makers, as well as people contingently involved, might not be able to consider some issues and dimensions of the value as they actually should be considered authentically, i.e. outside of contingency. Accordingly, construction should be on the one hand limited, on the one hand extended – i.e. "contextualized".

Contextualism could, therefore, be the philosophical perspective to relate this dual and apparently contradictory condition of validity of multi-perspective judgements to the reconstruction scenarios that determine the fate of peoples and territories.

Among the many definitions and perspectives of contextualism, the following seems to be the most appropriate to our purposes: "according to Wittgestein, contextualism is a model of epistemic justification that consists in legitimating beliefs through context. The context does not act as a self-justifying foundation of knowledge, but as an unjustified background to it" [21]. Therefore:

– according to the first dimension of limitation, the context can be taken as "the" overall and superordinate background of the validity of a chain of assumptions; for example, "a social system guaranties the sovereignty over just the body only within a liberal ethical-political conception, which ascribes to the person the character of full self-determination" [22]: the liberal conception doesn't need any justification, it is taken for granted;
– according to the second dimension, the context takes on a specific objectual and subjectual self-consistency: it is the "inertia" that characterizes the objects and their relations that make a place "that place". In this case, context delimits what really counts, and as such context is the subject of "what is owed to people and things, that is, what people and communities are responsible for" [23].

The above basic concepts has informed the development of the proposed conceptual model proposed (Fig. 2) and with reference to the following further and more specific considerations concerning the search for contextual self-consistency of an original, authentic and enduring home-city-landscape system. To this end, the Method of Oppositions can be used to better understand any concept in relation to its opposite. In order not to fall into the temptation of the "value relativism", the pairs of opposites were chosen from an axiological-ethical perspective, so that the subsequent is "undeniably better" than its antecedent. The terms of the following opposition (or groups of them) are present in the above model.

Unique vs Multiple, Quantity vs Quality: concerns the relationship in terms of value between homogeneous elementary units (BUs) and heterogeneous units (BAs). The latter have a social and administrative dimension transcending the former. Several assumptions have been made about the correct scoring construction of BAs composed of one, a few or many BUs, to represent the fair qualitative value attributed on the basis of quantitative variables.

Metrics vs Semantics, Indices vs Attributes: concerns the opposite placement of "reference" (the physical object like a BU) and "sign", the synthesis of the characteristics relevant to the cognitive process and the corresponding values relevant to communicative (comparative) action on it (the placement in the Timetable).

Things vs Goods: this opposition is consistent with the narrative that assumes market as the social place of the economic communication that transforms ("transcends") things into goods through of the abstract monetary measurement of their value [24].

Preferences vs Values: concerns the relationship between the individual perspective and the evaluation, the purpose of which is to transform subjective preferences into intersubjective value judgements; specifically, this opposition concerns the projection of the demand for performance implicitly expressed by the house and its relevance in the prospect of the building, urban, economic, social coherence of the reconstruction process (House/City matters!).

Facts vs Context, Semantic vs Syntaxes, Description vs Interpretation, Valuation vs Decision: with regard to the relationship between evaluation and programming, the single semantic merely supports the choices, while the global syntax coordinates the whole valuation and decision-making process; these opposites help to integrate the vertical comparisons between the characteristics and scores (semantics) of an urban phenomenon, as well as the horizontal comparisons (syntaxes) between all the phenomena.

Inflation vs Deflation, Information vs Communication: furthermore, a remarkable function of the model concerns the possibility of managing the Information-Communication Process: 1. to first inflate the information by generating many different layouts; 2. to then deflate this massive information by selecting the best ones, each of which within a specific dialogic context;

Space vs Time: this opposition extends into the future the contextuality of simple space and, consequently, the field of justification of the project.

Dis-order vs Order, Equilibrium vs Dis-equilibrium: the present experience is framed in a process of reconstruction aimed at transforming the Dis-order caused by the catastrophe into a new order that is inevitably different from the previous one. The new order must be based on a different kind of Dis-equilibrium, that is the necessary social tensions, in this case fed by people's reaction to the catastrophic situation, whose Equilibrium is the metaphor of thermodynamics.

Probable vs Possible, Process vs Event: these last oppositions converge towards the prospect (hope) of a new world creation. A Process is generally a gradual succession of facts that are strongly related to each other. An event is the effect that exceeds its own causes, so that: a process is somehow probable, an event is somehow possible.

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