Multidimensional Assessment for "Culture-Led" and "Community-Driven" Urban Regeneration as Driver for Trigger Economic Vitality in Urban Historic Centers

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Abstract: In the current scientific debate, cities represent the contexts in which resources, capital, skills, and talents are concentrated and, at the same time, they are places where many challenges are concentrated regarding environmental (pollution, waste, climate change), economic (unemployment, social exclusion, well-being), political (instability in governance processes, lack of strategic planning), and cultural (training, creativity and innovation) dimensions. The city and historic centers in particular, are able to experiment the paradigm shift from a linear economy to a circular economy, in which synergic, fair, and inclusive processes capable of activating new forms of urban productivity and social and economic innovation are promoted. In particular, the European Commission identifies cultural heritage as the main driver of development and supports strategies in which it is considered as one of the founding elements of possible transformations, which can be activated through mixed top-down/bottom-up approaches, in the short and long term. In this perspective, cultural heritage can play a decisive role in terms of the urban strategy capable of generating new economic, cultural, and social values, which trigger innovative dynamics of local development. To address current urban challenges, this paper attempts to use a multi-criteria analysis to decision support, starting with a Multi-Stakeholder Decision Analysis (M-SDA), in order to assist decision makers in choosing suitable scenarios to trigger circular development processes, taking into account the role of cultural heritage in a systemic landscape perspective. The result is a hybrid methodological approach for designing complex urban regeneration processes able to assess which new uses/functions and potential actions, identified by the involved community, can trigger a circular development model which could be more suitable to implement a model of "culture-led" and "community-driven" development.

Keywords: culture-led urban regeneration; circular economy; bottom-up processes; deliberative multi-criteria analysis; Multi-Stakeholder Decision Analysis (M-SDA); Multi-Criteria Decision Aid (MCDA); Novel Approach to Imprecise Assessment and Decision Environments (NAIADE); Analytic Network Process (ANP); multidimensional indicators

1. Introduction

In current scientific debate, cities represent the contexts in which resources, capital, skills, and talents are concentrated. At the same time, they are also the places where many challenges are established regarding environmental (pollution, waste, climate change), socio-economic (unemployment, social exclusion, well-being), political (instability in governance processes, lack of strategic planning), and cultural (training, creativity and innovation) dimensions. Therefore, the city is able to experiment with a paradigm shift from a linear economy to circular economy, in which it is possible to promote synergetic, fair, and inclusive processes capable of activating new forms of urban productivity and social and economic innovation [1–6].

In particular, the European Commission identifies the cultural heritage of cities as the main driver of development and supports strategies in which it is considered as one of the fundamental elements of possible transformations, which can be activated through mixed top-down/bottom-up approaches, in the short and long term [7–9]. In this perspective, the enhancement of cultural heritage can play a decisive role, not only in terms of increasing the life cycle of the heritage, but also as an urban strategy capable of generating new economic, cultural, and social values, supporting innovative dynamics of local development.

A decision-making process for "culture-led" and "community-driven" urban regeneration should include co-design and co-valuation approaches, considering the interrelations between the multiple components that characterize a complex decision-making context such as cultural heritage and communities they are part of. The construction of alternative cultural heritage-led scenarios includes collaborative processes, multi-level governance, and networks spread over different scales, which, acting on interdependent values, can guide the construction of interdependent and interconnected decisions [10]. These decisions can more effectively guide the strategic process, to open up development scenarios to new opportunities in constant "regenerative" evolution, with respect to which culture can be considered economically effective and socially sustainable, consistent with the principles of the circular economy.

The quality of the city and the territory are received by the market and can stimulate or discourage real estate investments as well as the policies that have obvious effects on the real estate sector, and on the balance or the relationships between different areas of the city.

In this perspective, the enhancement of cultural heritage, as part of a cultural heritage-led regeneration strategy, requires the creation of environmental, social, economic, and governance conditions to make culture an enabling device and, at the same time, a dynamic interface between the local economy and different communities [11].

For urban contexts, regeneration implies practices of re-use and functional recovery aimed at giving a new meaning to those areas which, due to physical, social, and economic transformations, have lost their essential originality over the years. Urban regeneration programs and projects are part of a relatively recent policy, which takes into account both tangible material resources (such as geographical location, urban city structure, real estate, cultural heritage, etc.) and immaterial resources (such as local identity, system of social and civil values of citizenship, competence of the productive, and social fabric).

That policies are the result of a gradual process of raising awareness of issues such as quality of life, environmental sustainability, economic development, and the enhancement of local identities.

In urban regeneration programs the central element is culture, from which it is necessary to start building a shared vision, a system of values and a common language within a community. For decades culture has been considered only as an intangible asset, useful for cultivating the spirit and the mind, and therefore not materially productive [12].

In this framework, adequate evaluation tools are fundamental to make the above mentioned principles operational.

The New Urban Agenda (NUA) [13] highlights the central role of evaluation processes in order to achieve all goals and stresses the importance of improving the transparency of data to ensure equity and spatial integration.

In the NUA [13] the importance of evaluation tools is underlined, too. In particular, the necessity of a variety of actors and means to implement the complex agenda is recognized, as well as a wide range of financial, planning, and evaluation tools [14]. Capacity development and mobilization of financial resources, impact assessment of investments and projects, and the capacity to formulate, implement, enhance, manage, monitor, and evaluate public policies for sustainable urban development are part of the main means.

Participatory practices play a key role in the implementation of the NUA. The "bottom-up" approach can trigger positive changes and its success lies in the participatory and inclusive urban development.

Current research on urban development is characterized by many studies aimed at providing an overview of the assessment of sustainable development [15]. In particular, studies about indicators able to capture the multidimensionality of sustainability are an open field of research [16].

The highlighted multidimensional perspective of cities transformation/regeneration implies a systemic and integrated approach that requires new assessment tools able to capture the multidimensional impacts.

It needs an integrated evaluation tool, in which quantitative economic aspects are enriched with qualitative indicators, expressed by social and environmental components.

This paper aims to contribute to the international debate about the role of cities in the achievement of sustainable development and to make operational concepts in the evaluations driving sustainable transformations of cities and territories to become "culture-led" and "community-driven". In this context, the methodologies used take into account the role that cultural heritage can play in a systemic perspective of the historic-urban landscape and in urban regeneration processes.

The application of the methodology to the case study is finalized to include multiple dimensions in the evaluation process, supporting the identification of sustainable development strategies and scenarios. This evaluation approach takes into account the above highlighted multidimensionality, including both expert and community knowledge.

The case study of the historic center of Catanzaro (Italy) represents an implementation of the proposed methodology, demonstrating its application potentialities. This study is part of an ongoing process and it aims to support the municipality during the decision process.

Considering previous reflections, the paper proposes the elaboration of a strategy of culture-led regeneration structured through a multi-dimensional decision-making process for Catanzaro, a historic center in Southern Italy.

Starting from a specific evaluation approach to deliberative methods, a Multi-Stakeholder Decision Analysis (M-SDA) was conceived. The result was a hybrid methodological approach for designing complex urban regeneration processes able to assess which new uses/functions and potential actions, identified by the involved community, can trigger a circular development model that could be more suitable to implement a model of "culture-led" and "community-driven" development.

The decision-making process is divided into three main phases. In the first two phases, the economic, social, and urban dynamics of the urban district were identified and analyzed, through the selection of some indicators and four possible alternative urban regeneration scenarios were identified. In the final evaluation phase, a multi-criteria and multi-group evaluation of the scenarios was carried out through the application of the Novel Approach to Imprecise Assessment and Decision Environments (NAIADE) and Analytic Network Process (ANP) methods. The final result of the decision-making process makes it possible to identify the preferable regeneration scenario—"guided by culture" or "community driven"—and makes it possible to make explicit those components that significantly influence local transformations that could guide the interaction between different stakeholders involved in a shared common vision.

The paper attempts to respond to the above issues through the following structure. Section 2 identifies the case study. Section 3 explains the methodological approach, analyzing the materials and methods and describing the different steps to assess which new scenarios and uses/functions could be more suitable to implement a circular development model in Catanzaro, and Section 4 includes a discussion and conclusions regarding the entire process.

2. The Case Study

The proposed application concerns the territory of Catanzaro, a medium-sized historic center (89,065 inhabitants) in the capital city of Calabria, located in Southern Italy, a town that plays a significant connective and strategic function in Calabria region (Figure 1).
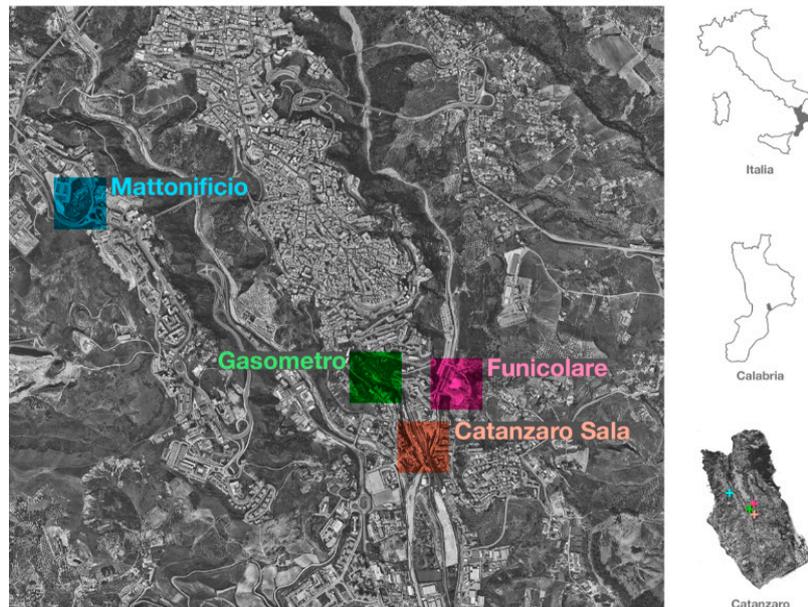
Figure 1. Historic center of Catanzaro: location of "target areas".

Cities occupy a central place on the European agenda, taking shape as the main territorial platforms in which creativity and innovation are concentrated. In the Calabrian urban context, Catanzaro is classified as an urban center at the regional level: it is one of those centers that for the plurality and the level of the functions provided, represents a functional pole attractor for the whole regional territory.

Catanzaro is strategically placed at the center of the Calabrian logistics and interconnection system, between the Ionian and Tyrrhenian Seas. It is also an important directional, commercial, university, health, and cultural center, hosting considerable administrative functions and regional level strategies.

Catanzaro has undergone profound transformations in recent decades, even more marked following the economic situation that started in 2008, which has had a decisive impact on the past industrial and craft vocation of the territory, with the accentuation of the tertiary identity of the city, moreover consolidated following the indication of the city as the capital of Calabria, partially balanced by the tripartite division of the old Province.

In fact, the traditional fabric of productive activity, largely centered on construction, suffered the greatest economic conjuncture, and went hand in hand with a substantial urban and social transformation of the city, which saw the gradual emptying of administrative, managerial, and commercial functions traditionally concentrated on the historic center. Now they have been delocalized either outside the city or in the peripheral areas, with the birth, among other things, of the "Germaneto" Business Park where "Cittadella Regionale", a railway station, university and hospital, food market, and several other economic initiatives are located.

This trend, together with the lack of a vast area urban planning tool, led to an irregular development of the urban settlements around Catanzaro and the start of a sort of unplanned conurbation towards the logistics area of Lamezia Terme. This had a devastating effect on the historic center, an identifying place in the history of the capital, which has been emptied of residents, businesses, and economically-productive social activities.

Catanzaro, as highlighted by the preliminary analysis of social, cultural, and economic dynamics lost almost 10,000 inhabitants in the last decade, reaching around 90,000 current inhabitants, and

a significant dispersion not only demographically but also socially and economically between the peripheral districts and the urban settlements of the neighboring municipalities.

Despite the critical elements described briefly, Catanzaro recently highlighted some highly positive data centered on:

- the presence of a youth population of university students off-site at the "University City";
- the birth of a strong tendency towards a "society of knowledge and culture" around the youth component and some places of innovation and cultural promotion, promoted by the world of associations and institutions. This included Catanzaro among the "Creative Cities of Italy" by Formez;
- the scientific and research development of the "Magna Graecia" University, and of the connected "Policlinico", which has become one of the most active Italian small/medium universities, that has allowed the consolidation of innumerable research initiatives, academic spin-offs, and start-ups of companies among young people and researchers, especially in the field of Health Sciences and Quality of Life, as well as Information and Communications Technology (ICT), so much so that Catanzaro is a candidate for a particularly prestigious "Health Center" at a national as well as regional level.

In this context, in recent years Catanzaro has been affected by a series of urban development programs, co-financed by the European Union or by extraordinary national funds, which have led to significant innovations and transformations in the urban layout of Catanzaro. They have also been the logical presupposition of the strategies of the current planning of an "Urban Agenda", and of the full sharing of the strategies placed at the center of the reflection of the programming from "Europe 2030".

The urban development and urban regeneration programs implemented over the last decade have had positive effects, reversing the negative trend that had occurred on the real estate market following the depletion of functions in the historic center.

The overall picture among all categories of property for sale in Catanzaro shows that in the last 10 years prices have increased substantially (+3.53%). The significant increase in prices reported is fairly definite and homogeneous over the period.

With specific regard to the individual segments of the real estate market in Catanzaro, it is possible to observe that the type that has registered the highest percentage appreciation is made up of commercial premises: the prices show an increase of around 9% (Table 1).

Table 1. Real estate market in Catanzaro.

Typology	Sale (€/sqm/)	Rent (€/sqm/Month)	Var. % 10 Years
Flat	€1000/sqm	€6.1/sqm/month	+4.10%
Attic	€1050/sqm	€6.9/sqm/month	+5.74%
Two-family	€1100/sqm	-	+0.27%
Bi-roomed	€900/sqm	€7/sqm/month	+1.17%
Independent house	€1050/sqm	€4.8/sqm/month	+0.25%
Semi-detached house	€900/sqm	€6.2/sqm/month	−0.08%
Commercial local	€1250/sqm	€9.6/sqm/month	+9.06%
Attic	€950/sqm	€6.4/sqm/month	+1.73%
Studio flat	€950/sqm	€9.2/sqm/month	+3.53%
Penta-roomed	€1050/sqm	-	+3.00%
Four-roomed	€1050/sqm	€5.2/sqm/month	+7.63%
Tri-roomed	€1000/sqm	€6.2/sqm/month	+3.88%
Office	€1050/sqm	€7.4/sqm/month	+7.55%
Villa	€1100/sqm	€4.3/sqm/month	+1.06%
Townhouse	€1200/sqm	€4/sqm/month	+3.11%

Data source: Real Estate Market Observatory.

The actual urban development strategy of Catanzaro pursues some general objectives, within the regional guidelines defined for "Urban Agenda":

- Specialization of the city from the perspective of competitiveness;
- Concentration of investments on areas of redevelopment and regeneration of degraded urban spaces.

The strategic choices of the "Urban Agenda" programming tool will concern, among others, the recovery and revival of the historic city center as a priority (through the identification of some "target" areas/neighborhoods) now decertified following the relocation of urban, institutional, and commercial functions, and burdened with strong critical elements related to the degradation of the building heritage and the conditions of social decay, in close interconnection with the strengthening of the Germaneto Business Area and with the University Research Center, and with the development of the Catanzaro Lido district.

These development options, which constitute the "great challenges" foreseen for Catanzaro and its future, together with the planning choices of the territorial development of the city, confirm some strategic choices that had already been inserted by the "Broad Area Strategic Plan" of the city, which had outlined Catanzaro as the "City of Hospitality, Knowledge and Innovation".

3. Material and Methods

3.1. Purpose of Research and Methodological Approach

The research is aimed at developing a methodology to outline regeneration strategies guided by culture [17,18] in order to develop potential for the historic center of the city of Catanzaro (Italy). The interpretative model developed for the study context analyzes the system of values (use, non-use, and intrinsic) [19] in order to identify the shared values [20].

The need to develop an urban regeneration strategy that safeguards the identity of the historic center stems from the profound social, economic, and environmental transformations that took place in the urban study area, which highlight the need to seize new opportunities that are taking shape, in a balance between conservation and transformation, in which culture can be an important component of values.

The approach used in the research makes use of a multidimensional decision-making process to support decision makers in choosing an appropriate set of actions to build future alternative scenarios through bottom-up and top-down processes [21,22].

For this purpose, a participative methodology has been developed and tested to assess the knowledge and uptake of local stakeholders in relation to the circular model of historic city development, taking into account the role of cultural heritage in a systemic historic city landscape perspective [23,24].

The experimentation started with the evaluation of the existing programming and planning tools, trying to define a series of possible new uses and alternative scenarios for some defined 'target' areas, in order to trigger circular development processes for regeneration urban strategies.

A distinctive feature of the methodology followed in this study was the combined use of different tools for the design of complex urban regeneration processes, within a multilevel decision-making process capable of supporting strategic planning, with specific reference to the processes of regeneration of degraded urban areas located in historic contexts, where there is a cultural heritage to be valorized.

In this context, given the limited availability of economic resources, it is essential to select an urban intervention policy that maximizes the collective benefit.

The final results of the evaluation phase have been analyzed and discussed, highlighting whether and how the possible functions and scenarios identified by the involved stakeholders can trigger a circular historic city development model.

3.2. The Integrated Decision Support System for the Choice of Alternative Scenarios

The evaluative approach tailored to the case study was built on deliberative assessment methods and Multi-Stakeholder Decision Analysis (M-SDA) capable of making an interaction between the different actors involved towards a shared vision, taking into account the role that cultural heritage can play in a systemic historic city landscape perspective [23,24].

The proposed methodological approach aims to include multiple dimensions in the evaluation process supporting the identification of sustainable development strategies, including both expert and community knowledge.

The choice of a participative methodology is aimed at the engagement of key territorial actors in the discussion on the circular economy/circular city models, trying to creatively hybridize the academic knowledge with the practice knowledge of stakeholders and their visions and needs for historic city regeneration. Multi-criteria evaluation tools were applied to support the process of co-learning and co-design towards a proposal of a new shared action plan for the Catanzaro historic center.

The result is a hybrid methodological approach for designing complex urban regeneration processes able to assess which new uses/functions and scenarios could be more suitable to implement a model of culture-led development.

3.2.1. Analysis of the Social, Cultural, Economic, and Urban Dynamics

Some preliminary analyses were indispensable in the evaluation of the context, and useful for understanding the social, cultural, economic, and urban transformations and dynamics that took place in the urban area in the last three decades.

The aforementioned preliminary analyses extracted are the same ones elaborated by the author in a previous publication and reported for easy reading in Appendix A [16].

This identified the corrective actions to develop culture-led regeneration scenarios.

The analysis of existing regulatory and planning tools has allowed for the identification of a first series of functions relative to some degraded areas identified as 'target areas' in which there is a cultural heritage to be enhanced.

During the participation process for the definition of the Catanzaro Urban Agenda which brought together common knowledge and expert knowledge [25–28], local actors and authorities have identified some "target areas" and development visions.

These "target areas", even if characterized by a series of critical issues, have considerable potential for triggering virtuous processes of value building and active community involvement [26–28].

These areas are found in Catanzaro's disused public heritage and represent run-down areas (Figure 1), with the presence of abandoned industrial buildings and historic disused buildings:

- "Mattonificio" abandoned industrial park.
- "Catanzaro Sala" disused train station.
- "Gasometro" archaeological buildings and Valletta's urban park.
- "Funicolare/Parco Commerciale Romani" and surrounding urban area: shopping center.

The context analysis and analysis of existing regulatory and planning tools, which identified the first series of functions relative to the above degraded areas, considered as 'target areas', in which there is a cultural heritage to be enhanced.

3.2.2. The Participative Approach: Multi-Stakeholder Decision Analysis (M-SDA)

There are several European cities that, to increase their competitiveness, have activated a "culture-driven" approach to local development, built on their specific cultural profiles.

Cultural capital and cultural productivity are recognized as a resource, in which the active involvement of the community, sharing, and cooperation are fundamental ingredients to promote and develop new projects oriented to a cultural economy.

For the study area, a participative methodology was developed and tested to assess the knowledge and uptake of local stakeholders in relation to the culture-led model for Catanzaro' historic center development [23,24].

The proposed methodological approach aims to include multiple dimensions in the evaluation process supporting the identification of sustainable development scenarios, including both expert and community knowledge.

The first step of the research was developed through the involvement of stakeholders to understand their awareness about the identification of potential actions to be localized over target areas, able to increase, in a culture-led perspective, the multidimensional city productivity.

In the participatory phase a map of the stakeholders was elaborated.

In the first step, some focus groups were realized to explore through a series of questions which were the future visions and desired urban changes.

The focus groups involved the following stakeholders' categories: institutions and local governments (Calabria Region, Municipality of Catanzaro, Superintendence), economic operators (operators of the creative, leisure, and tourism industry), local community (residents and representatives of citizens' associations, tourists, visitors), and planners/practitioners (Professional Association of Geologists, Professional Association of Architects, Professional Association of Engineers, Association of Builders Construction of Catanzaro, Industrial Union).

The different focus group sessions made it possible to bring out those significant components useful in identifying a series of potential actions to be included in the alternative scenarios for the definition of a shared culture-led urban regeneration model [26,27].

Subsequently, in order to include the perspective of local residents and members of civic associations in the definition of a shared masterplan for the "target areas", a semi-structured questionnaire was administered to the larger local community as well as focus group participants. The questionnaire was administered both on paper and online, reaching a total of 63 complete out of 100 total questionnaires. The questionnaire's key points were chosen by individual experts in the fields of urban planning, architectural history, cultural heritage, and economic evaluation.

This was mainly implemented to identify further additional functions for the valorization of cultural heritage assets located in the historic center.

Throughout the participation process, some intervention priorities were identified and some keywords emerged (from the analysis of the strengths and weaknesses and of the potentiality) which were subsequently translated into potential actions capable of triggering and promoting, if adequately supported, real "culture-led" urban regeneration processes.

The final result was a thematic checklist that represents the key points for the design of urban regeneration actions for the identified target areas, aimed at enhancing the cultural (material and immaterial) heritage of the historic city (Table 2).

Table 2. Thematic checklist.

Thematic Checklist
A1. Building a network of citizens and visitors
A2. Promote creative and innovative activities and shared projects
A3. Encourage multicultural integration to build meaningful social relationships
A4. Promote cultural growth accessible to all
A5. Promote the sharing of knowledge and skills
A6. Improve hospitality promotion strategies
A7. Increase opportunities for new jobs
A8. Recover and restore abandoned and/or disused places of cultural and natural heritage
A9. De-seasoning and differentiating the tourist offer
A10. Promote and enhance local craft activities
A11. Improve the accessibility of places

Finally, the "culture-led" and "community-driven" proposed model of development of the historic center activated by bottom-up and top-down processes, presented, discussed, and shared with the entire community involved, allowing the team of researchers to identify those significant components and select those actions to configure the alternative culture-led regeneration scenarios, which will be evaluated in the next phase.

3.2.3. Social Multi-Criteria Evaluation (SMCE) Approach

In the decision-making processes of urban regeneration, a multidisciplinary perspective that involves the application of participation techniques able to create an interactive relationship between "expert knowledge" and "common knowledge" [16] is of fundamental importance. The development and testing of structured and feasible toolkits aim to understand, quantify, and use the economic and non-economic benefits of urban heritage in a sustainable development perspective [19]. The use of increasingly multi-dimensional and multi-group assessment methods, adapted to intervention contexts, have become strategic tools for achieving the aforementioned purpose.

Integrated assessments aim to overcome the limitations of traditional approaches, which are based exclusively on the priorities and preferences expressed by the experts' knowledge, also taking into account the preferences of the local community.

Through multi-criteria and multi-group assessments it is possible to recognize the centrality of the conflict and find more satisfactory solutions for the resolution; in this regard it is important that the assessments are of an adaptive and participatory type, in order to involve more points of view in the decision-making processes. To this end, Social Multi-Criteria Evaluation (SMCE) [29] is a very effective tool to manage the multiplicity of opinions and conflicts in various cultural and geographical contexts.

Specifically, it can be defined as a process capable of dealing with complex issues through knowledge from different disciplines. Therefore, these are multidisciplinary approaches and the objectives are constructed through dialogue, comparison, and exchange between the social partners who communicate and explain their values in a continuous learning process, able to involve promoters, users, and operators called to make value judgments.

The explicit use of preferences by the parties involved thus allows a map to be constructed of the perceived values and complex interactions between them [16,25] In this perspective, Munda [29–31] introduces the concept of multi-criterion social evaluations which focuses on the transparency issues of the entire evaluation process whose results depend on ethical positions, interests, and values considered.

Multi-Criteria Decision Analysis (MCDA) tries to incorporate the multidimensionality of various decision-making aspects, but Munda also proposes an extension of the MCDA enhancing the importance of involving stakeholders and defining the concept of SMCE, emphasizing the importance of participatory processes, understood as necessary but not sufficient [30–32]. The SMCE is therefore a dynamic method which, due to its specific nature, must be adaptive, therefore it implies continuous feedbacks between the various phases of the process and between the actors involved. The aforementioned method is proposed as an alternative to the Stakeholders Multi-Criteria Decision Aid (SMCDA).

The software used to classify the solutions was the NAIADE (Novel Approach to Imprecise Assessments and Decision Environments) [29–31]. The NAIADE is a discreet multi-criterion method that is particularly flexible for real applications and its specific peculiarity is the analysis of conflicts to be integrated with the multi-criteria results. It was useful to bring out an order of preferability between the proposed solutions and a coalition dendrogram designed to highlight the level of consensus for each of the actions considered as alternatives.

The method involves two types of assessments—a multi-criteria analysis, performed on the impact matrix (alternatives vs. criteria) and a social impact matrix, which analyzes conflicts between different interest groups and, through an equity analysis (groups vs. alternative), gives a linguistic indication of the interest group judgement for each of the alternatives. The choice to use the NAIADE tool arises from the need to create a sort of common knowledge platform that facilitates:

1   the participation of the actors;
2   sharing information;
3   the analysis of often latent conflicts;
4   the transparency of the evaluation process;
5   the construction of choices capable of responding to specific expectations.

In this article, for the purpose of the evaluation, a social impact matrix was used to understand the preferences of the actors on the various possible actions to be placed in the study area and to support, in the next phase (with the ANP method), the identification of the most appropriate combination of these for the regeneration guided by the culture of the study area.

3.2.4. NAIADE Implementation

The equity analysis (Figure 2) provided a ranking of actions, considered as alternatives, according to the stakeholders' preferences on the basis of the information coming from the participative phase (the NAIADE inputs are data coming from the administrated questionnaire) and indications of the distance of the positions of the interest groups and possibilities of convergence of interests and/or of coalition formation.
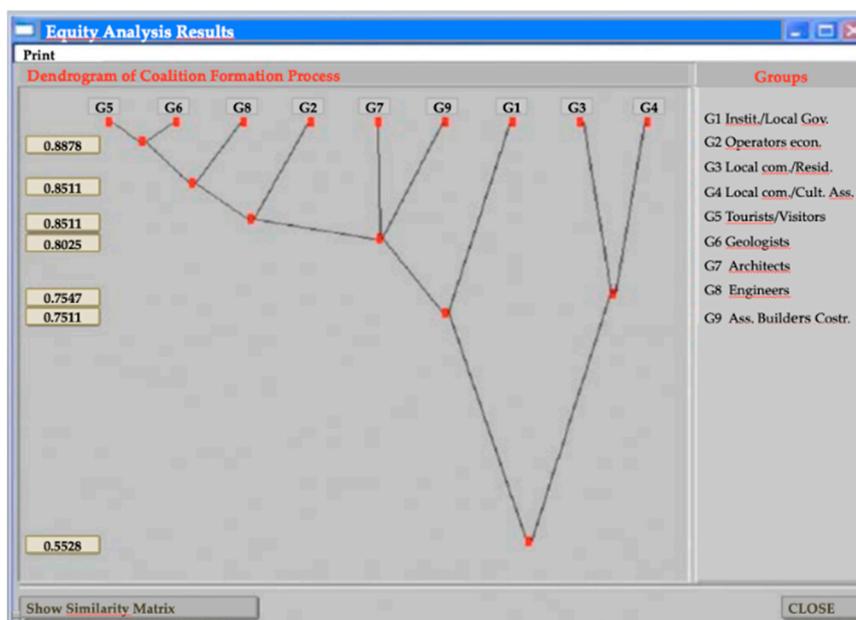
Figure 2. Novel Approach to Imprecise Assessments and Decision Environments (NAIADE) Outcome method: Equity analysis.

The elements equity matrix shows, in a qualitative scale (linguistic expressions), the opinions of stakeholder groups in reference to the alternative scenarios, that is to different actions for the target areas' re-functionalization. The processing of these data leads to the calculation of a similarity matrix, in which the similarity level of the opinions of each pair of stakeholder groups is presented.

Each interviewee expressed a ranking of preferences about the actions, proposed in Agenda Urbana, developed and revised in the successive participatory phases.

3.2.5. NAIADE Outcomes

The outcome of the NAIADE method is an order of preference between the above actions (alternatives) (Table 1).

The dendrogram of coalitions expresses the relationship between the stakeholders, their degree of conflict, and their level of consensus for each alternative [30–35].

The dendrogram provides useful information about the consensus reached for each alternative and about divergences in opinion: a great divergence can lead to restructuring the alternatives. It is elaborated through subsequent aggregations and it lies in correspondence with the level of consensus equal to 0.5520; the lower red dot in the dendrogram combines all stakeholders' opinions (Figure 2).

The software NAIADE shows a preferability ranking (Table 3). The goal was to identify the actions characterized by the higher level of consensus among community members; a defensible and fair decision that reduces the level of conflict and reaches a certain degree of consensus.

Table 3. Final ranking.

	Potential Actions	**Ranking**
A8.	Reusing Spaces and Places	0.75
A4.	Cultural Promotion	0.89
A1.	Building Network	1.45
A9.	De-seasonalization and differentiating the tourist offer	1.69
A7.	Creating Jobs	2.05
A3.	Multicultural Integration	2.23
A5.	Sharing	2.54
A2.	Creating Projects	2.68
A10.	Promoting Local Craft Activities	2.73
A6.	Promotion and Communication	3.06
A11.	Improving Accessibility	3.07

This output was also useful for identifying the weights to be assigned to alternative actions in the following step of the evaluation process through the ANP method.

Once community preferences were identified, the next step was carried out in order to understand the combination of resulting actions and having more impact on the historic city multidimensional productivity, creating relationships between the "target areas" and the broader territorial resources (landscape and the natural and cultural heritage) for a urban regeneration "culture-led" and "community-driven" circular model.

The appropriate combination of the actions which achieved the higher level of consensus makes it possible to implement four urban regeneration alternative scenarios for the select target areas:

S1.　Smart City: Providing a new identity based on the concept of smart city – "Mattonificio": abandoned industrial park.

S2.　Start Up: Creation of innovative business activities -Area of "Catanzaro Sala" disused train station.

S3.　Cultural, Creative Community Hub: Creation of new cultural services, including enhancement of the small economic activities and creation of a new urban park – "Gasometro" archaeological buildings and Valletta's urban park.

S4.　Sharing City: Requalifying the existing public spaces in the area, with special attention to innovative shared solution for living and working (such as bike and car sharing, open wi-fi access, etc.) - Area "Funicolare/Parco Commerciale Romani".

In the final phase of the evaluation process, a multi-criteria decision support system was used: the Analytic Network Process (ANP) method.

The ANP is an interactive approach that evaluates the attractiveness of options starting from qualitative and quantitative judgements about differences in reference to a global goal [36–40].

3.2.6. ANP Method Implementation

The multi-criterion and multi-group evaluation was developed by implementing the Analytic Network Process (ANP) method [36–38] to evaluate the alternative urban regeneration scenarios that emerged as significant. The final result is the perceived preferable scenario and a ranking of preferability among the alternatives of the process participatory.

The ANP is an MCDA (Multiple Criteria Decision Aid) method, which overcomes the critical aspects of the Analytical Hierarchy Process (AHP), incorporating in the evaluation process the internal and external dependencies between the sets of criteria [29,30] and the interrelations between the different dimensions: economic, social, environmental, and cultural.

The choice of criteria (clusters) derives directly from the alternatives [29] and represents the technical translation of the objectives and the needs of the actors, resulting from the institutional analysis and elaborated by the research group.

More in detail, in the case study, there are five clusters of the network; twelve are the nodes of the network that represent the sustainability indicators, distributed into four clusters, as shown in Table 3.

The thirteen indicators, grouped into four classes, are the indicators considered fundamental for choosing the most suitable scenario for sustainable culture-led regeneration (Table 4).

Table 4. The sustainability indicators.

Criteria	Indicators
C1. Economic	I11. Attractiveness I12. Permanent Jobs I13. Investment Costs I14. Payback Period (PBP)
C2. Social and Culture	I21. Socio-Cultural Associations I22. Cultural and Recreational Services I23.Potential for Cultural Initiatives
C3. Accessibility	I 31. Pedestrian Connections I32. Proximity to Public Transport
C4. Urban Landscape Quality	I41. Permeable Surface Area I42. Traffic Restriction I43. Quality of Landscape I44. Mixed Functionality

Below is a description of the criterions used in the ANP process.

I11   Attractiveness: the criterion considers the presence of activities such as shops and public services as an attractive factor, both for the inhabitants and for the visitors of the area, in order to trigger economic development in the area; the criterion is measured by a qualitative scale (q.s.): very good; good; moderate; bad; very bad; the criterion has to be maximized.

I12   Permanent jobs: the employment impact linked to the management of the activities; the criterion is measured by a quantitative scale (n.); the criterion has to be maximized.

I13   Investment costs: the criterion include all investment costs; the criterion is measured by a quantitative scale (sqm/€); the criterion has to be minimized.

I14   Payback time (PBT): the criterion considers the period of time needed for the initial investment to be repaid; the criterion is measured by a quantitative scale (year); the criterion has to be minimized

I21   N. Socio-cultural associations: the criterion is measured by a quantitative scale (n.); the criterion has to be maximized.

I22   N. Cultural and recreational services: the criterion is measured by a quantitative scale (n.); the criterion has to be maximized.

I23   N. Potential for cultural initiatives: it is measured by a qualitative scale (q.s.) using pre-defined "linguistic variables" such as "good", "moderate", "very bad" and so on; the criterion has to be maximized.

I31   Pedestrian connections: the criterion considers the presence of pedestrian connections in the area and is measured by a qualitative scale (q.s.) using pre-defined "linguistic variables" such as "good", "moderate", "very bad" and so on; the criterion has to be maximized.

I32   Proximity to public transport: the criterion is measured by a quantitative scale (minimum walking distance in minutes from buses and train stations); the criterion has to be minimized.

I41   Permeable surface area: the criterion represents the effects of the transformation in terms of green areas and it is measured by a quantitative scale (sqm: area of permeable surface considered in the alternative scenarios); the criterion has to be maximized;

I42   Traffic restriction: the criterion represents the quality of life measured by the percentage of area limited to traffic compared to the available road area; the criterion has to be maximized;

I43   Quality of landscape: the criterion considers the pristine condition of the landscape and the environment; it is measured by a qualitative scale (q.s.) using pre-defined "linguistic variables" such as very good, good, moderate, bad, very bad; the criterion has to be maximized.

I44   Mixed functionality: the criterion considers the functional mix in the area and is measured by a quantitative scale (n. number of activities in the alternative scenario); the criterion has to be maximized.

To verify the stability of the judgment, the index relating to the inconsistency ratio (IR) was drawn up, which returns for all indicators an IR always lower than 0.1 [37].

The limit super-matrix in Figure 3 provides the priorities vector of each element of the decision network.
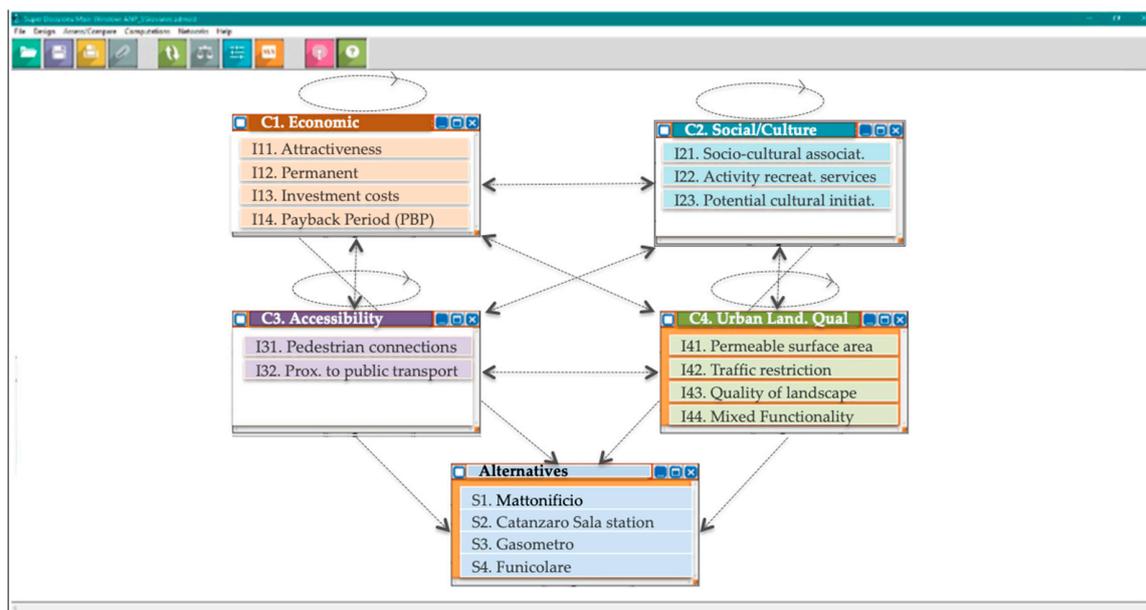
Figure 3. Analytic Network Process (ANP): screen shot from Super decision software.

It is possible to observe (Table 5) that the most relevant issues are expressed by the values of the indicators within the cluster "Society and Culture". In fact, the highest priority is attributed to indicator "I22. N. Cultural and Recreational Services"—with IR value of 0.01 and to indicator "I21. N. Socio-Sultural Associations" in the same cluster that has a value of 0.07.

Table 5. Alternatives' performance matrix: indicator values and inconsistency ratio (IR) of the judgements.

Criteria	Indicators	Goal	Unit	Alternatives				IR
				S1. Smart City	**S2. Start Up**	**S3. Cult. Creat. Hub**	**S4. Sharing City**	
C1.	I11. Attractiveness	Max	q.s.	Moderate	Very good	Good	Good	0.01
ECO	I12. Permanent Jobs	Max	n.	18	6	20	15	0.01
	I13. Investment Costs	Min	MLN €	5930	1306	3925	6545	0.08
	I14. Payback Period (PBP)	Min	year	9	7	5	6	0.06
C2.	I21. N. Socio-Cultural Associations	Max	n.	1	3	4	5	0.07
SO/CU	I22. N. Cultural and Recreational Services	Max	n.	2	-	4	1	0.01
	I23. N. Potential for Cultural Initiatives	Max	q.s.	Good	Good	Very Good	Good	0.01
C3.	I31. Pedestrian Connections	Max	q.s.	Bad	Moderate	Very Good	Moderate	0.02
ACC	I32. Proximity to Public transport	Min	min.	Moderate	Very Good	Good	Very Good	0.01
C4.	I41. Permeable Surface area	Max	sqm	14,940	8262	51,470	10,950	0.02
ULQ	I42. Traffic Restriction	Max	%	70	40	60	55	0.01
	I43. Quality of Landscape	Max	q.s.	Moderate	Moderate	Very Good	Moderate	0.03
	I44. Mixed Functionality	Max	n.	5	1	6	4	0.01

Equally high values were also obtained for the two indicators belonging to the "Economic" cluster: "I12. Permanent Works" and "I11. Attractiveness" with a value of 0.07.

On the other hand, there are low values, in the range 0–0.03, for the indicators within the "Accessibility" and "Urban Landscape Quality" clusters, which vary.

The final values (Table 6) show that the best-fit scenario for the focus area is "S3. Cultural Creative Hub - "Gasometro" archaeological buildings and Valletta's urban park" with 66.9% of priority, normalized by the cluster "alternatives"; followed by "S4. Sharing City - Area "Funicolare/Parco Commerciale Romani" (43.5%), "S2. Start Up - Area of "Catanzaro Sala" disused train station" (42.7%) and "S1. Smart City - "Mattonificio": abandoned industrial park" (32.7%).

Table 6. Final ranking ANP.

	Scenarios	Ranking
S3.	Cultural, Creative Community Hub - Valletta's urban park	66.9%
S4.	Sharing City - "Funicolare e Parco Commerciale Romani"	43.5%
S2.	Start Up - Catanzaro Sala's	42.7%
S1.	Smart City - "Mattonificio"	32.7%

4. Discussion and Conclusions

The paper proposes an integrated approach useful to support the decision-makers in the "culture-led" and "community-driven" regeneration process for the historic center of Catanzaro.

The Multi-Stakeholder Decision Analysis (M-SDA) is applied as a case study to four alternative scenarios, by applying NAIADE and ANP methods. This application allowed exploring the potential of an integrated approach useful to identify preferable scenarios of cultural heritage-led urban regeneration according to bottom-up and top-down approaches [16,21].

According to the report "State of the World's Cities Report 2004/2005. Globalization and Urban Culture" from the United Nations [41], many cities in the world have begun to propose a renewal of the local economy focusing on the construction of cultural regeneration processes. Starting from the assumption that culture can be an engine for economic growth, a particular interest has been reserved for investments in industries and creative and cultural districts, improving the quality of spaces and socio-cultural services, and proposing to harmonize the different social interests by improving the quality of urban life.

Culture, a vital ingredient of urban environment, has become a success factor for the localization of creative processes, to which the attention of local administrations is addressed, motivated by the need to reposition the cities in the global market and at the same time create a favorable environment for the new forms of economy based on technology, creativity, human capital, and the ability to innovate [6].

While values were redistributed in the traditional economy, in contemporary approaches (circular economy, civil economy, sharing economy) values can be produced within cooperative and collaborative processes [42,43]. At the same time, it is possible to highlight how, not only the "culture" and "creativity", but also the communities, are indispensable; identifying the ways to activate change in community-driven processes [44,45] of the existing cultural heritage in the processes of transformation and cultural enhancement of cities.

On the one hand, it is significant that local administrations and individuals are concerned about understanding the economic impacts of investments in art and culture; on the other, it is crucial that local communities can become promoters of cultural actions and processes aimed at identifying new organizational, social, and economic models. A sustainable model of urban regeneration generated by culture requires, in fact, an integration between two complementary, top-down and bottom-up approaches, making dialogue, mutual exchange, and mutual cooperation possible. A "hybrid" approach emerges trying to consider the complexity of a culture-led development process by dealing with it and managing it through interdisciplinary tools [46].

Culture, therefore, is becoming a new "platform", capable of generating both economic values and social values, while taking on different roles: systemic coordination of integrated innovative processes, creation of new forms of active citizenship based on knowledge, and definition of new wellness standards. Therefore, it is considered appropriate to develop an approach to regeneration capable of involving several components simultaneously, in order to exploit their strategic complementarities and the appropriate synergies, and balance the systemic effects, combining different models: a development model based on the ability to attract external resources, both talents and creative companies; a model based on the competitiveness of local resources, characterized by a high level of competence and specialization; a model based on participation and social cohesion, with particular attention to the enhancement of initiatives that build enabling conditions, foster community capability-building and the entrepreneurial capacity of cultural and creative enterprises.

The construction of alternative cultural heritage-led scenarios includes collaborative processes, multi-level governance, and networks spread over different scales, which, acting on interdependent values, can guide the construction of interdependent and interconnected decisions [10] and effectively orientate strategic planning aimed at defining development scenarios and new opportunities in constant "regenerative" evolution, against which culture can be considered economically effective and socially sustainable, in line with the principles of circular economy.

In this perspective, a cultural heritage-led regeneration strategy requires the creation of environmental, social, economic, and governance conditions in order to make culture an enabling device and, at the same time, a dynamic interface between the local economy and different communities.

The integrated evaluation approaches are complex evaluation systems of decision support, able to support the planning of shared and transparent planning and design choices [16,21,22,47].

These complex decision-making processes are characterized by the presence of several variables and a high level of uncertainty. They need integrated evaluation approaches capable of supporting the design of shared and transparent choices.

In these decision-making contexts, the evaluation process and the combined use of various methods and techniques are certainly useful to outline a conscious and shared program of transformation and enhancement, able to reflect the evolution of an interactive and dynamic dialogue of the community, the know-how of the local community and experts. This then incorporates into the evaluation process, characterized by continuous and constant interactions and feedback, the perception of the tangible and intangible relationships of the stakeholders and their system of values and relationships, and to identify weights and priorities aimed at the selection of actions attentive to the context [47,48].

However, problems can arise in relation to the specificities of the context and the application of the evaluation techniques here used. Indeed, data collection requires careful selection of reliable and up-to-date sources, as well as the willingness of stakeholders to collaborate in the decision-making process. During the evaluation process a positive and effective interaction between various fields of knowledge and points of view was possible thanks to the use of the NAIADE approach. During the assemblies, the use of the NAIADE method made it possible to make explicit the preferences and activate an incremental assessment that allowed the team of researchers to identify conflicts and build coalitions converging towards shared visions.

In conclusion, through the methodological path described here, it was possible to promote good governance processes and build urban regeneration strategies. The path developed is flexible and adaptive, through the use and combination of complex assessment techniques for the involvement of the whole community, it is able to improve local deliberative democracy and enable effective collaboration between promoters, operators, and users [48], aimed at creating consensus on intervention actions [19].

Certainly the success of the course will also depend on the degree of integration that can be achieved through concertation/participation/coordination processes, which implies a great capacity for coordination of public institutions and the implementation of "good" initiatives for the involvement of stakeholders that operate in the territory (private individuals, socio-cultural associations, and active citizenship) [49].

Only with the support of integrated assessment approaches and inclusive processes is it possible to build shared actions in a long-term vision and effectively develop and build public decision-making.

Funding: This research received no external funding.

Conflicts of Interest: The author declares no conflicts of interest in the results.

Appendix A.

Table A1. Indicator categories for social criteria.

Criteria	Indicators	U.M
Social Criteria	Total residents	n.
	Residents by age groups	n.
	Residents by age groups	n.
	Residents by educational qualification	n.
	Single person households	n.
	2–5 person households	n.
	>5 person households	n.
	% or n. of residents in low-income households	% or n.
	% or n. of foreign residents	% or n.

Table A2. Indicator categories for cultural criteria.

Criteria	Indicators	U.M
Cultural Criteria	N. associations	n./10,000 inhab.
	N. social centers/community center	n.
	% or n. non-profit organization	% or n.
	N. events or projects supported by volunteers	n./year
	N. people employed in creative sector/tourism sector	n.
	N. people employed in the third sector	n.
	N. employees in supporting institutions for culture	n.
	N. historic buildings	n.
	N. religious buildings	n.

Table A3. Indicator categories for urban criteria.

Criteria	Indicators	U.M
Urban Criteria	N. School buildings	n.
	N. or % well-preserved buildings	n. or %
	N. or % buildings in poor condition	n. or %
	N. or % historic building with minor problems	
	N. or % buildings in ruin	n. or %
	N. or % improper housing	n. or %
	% used/partially used historic building	%
	% unused historic building	%
	N. historic properties designated as cultural heritage	n.
	N. restoration and adaptation works on historic buildings/sites	n.
	% re-functionalized historic buildings	n./year
	Area of facades of historic buildings rehabilitated	sqm
	% citizens satisfied with historic buildings quality	%

Table A4. Indicator categories for Economic criteria.

Criteria	Indicators	U.M
Economic Criteria	Average price of properties	€/sqm
	Average rent value for residential properties	€/sqm
	Average rent value for commercial-use properties/offices	€/sqm
	N. or % of new residences	n. or %
	N. or % of social housing units	n. or %
	N. or % of office spaces	n. or %
	N. or % of commercial units	n. or %
	N. of new constructions/rehabilitations	n./year
	% of ownership houses/commercial units	%
	% of rented houses/commercial units	%
	Housing/properties vacancy rate	%
	% real estate owned by public bodies	%
	% real estate owned by private properties	%
	Increase in taxes related from the tourist tax	€/year %
	N. artisans registered	n.
	N. new cooperative enterprises	n./10,000 inhab.
	Youth employment rate/Employment rate	%
	N. people daily working in the historic center	n./day
	N. or % jobs in hotels, restaurants, shops, cultural projects, etc. (temporary or permanent, direct and indirect)	n. or %
	N. creativity jobs supported by digital sectors	n.
	N. new businesses	n.
	N. or % of new jobs related to typical local production/distribution	n. or %
	N. of businesses in historic center	n./year
	Average income	€/year
	Average monthly salary	€/month

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