# SOCIAL SUSTAINABILITY AND URBAN REGENERATION PROCESS: A NAIADE APPLICATION FOR SOCIAL IMPACTS EVALUATION

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Abstract Sustainable development is a widely used concept which is increasingly important in urban and territorial transformations. The concept of sustainability concerns the environmental, economic and social dimension and the aim of sustainable development is to find a balance between these. The social dimension of sustainability has been recognized to be the most ignored of the three dimensions. It has received increasing attention during the last few decades, also due to its involvement in the Sustainable Development Goals of the Urban Agenda 2030, which aims to create sustainable and inclusive communities. In this document, specific attention devoted to the quality of life of the inhabitants, supporting the valorisation of cultural resources, protecting the environment, bringing economic development and its policies and involving the local communities in the programmes to make the collective forces converge in the realization of shared efficient projects that responds to real needs of social classes. This paper focuses on the analysis of the social dimension in the context of urban transformation processes. In this paper six different urban regeneration strategies for the regeneration of an urban area locates in Northern Italy have been evaluated according to their social impacts on the stakeholders involved in the process. The paper proposes a multimethodological approach based on the stakeholders and the NAIADE methodology. The stakeholder analysis has been used to identify the actors to be involved in the evaluation, whereas the NAIADE methodology has been used to select the preferable strategy by a multi-ranking approach. Through this method, the scenarios have been evaluated comparing and mediating the technical and the social ranking in order to consider also the stakeholder preferences. The final result is coherent with the initial purpose and it allows to demonstrate that the inclusion of the stakeholders is fundamental for the achievement of a consensus solution.

## **1. INTRODUCTION**

Social sustainability is relatively a new node of discussion on sustainable development that tackles social issues such as inequality, displacement and poor quality of liveability [1]. Different scholars observe social sustainability from different perspectives [1, 2]. Some authors discuss social sustainability in relation of democracy and equity [3], while others highlight the relationship between urban development and social sustainability focusing on community participation and engagement [4], also exploring the social dimension of sustainability through social impacts of physical elements and urban transformation [5, 14]. The existence of several definitions and interpretations of social sustainability which sometimes overlap highlights the difficulty of reaching and evaluating this condition [2]. Among the main methodologies available in the literature for the evaluation of social impacts of urban and territorial transformations [5, 17, 18, 19] the present paper proposes an application of the NAIADE method.

## 2. METHOLOGY: NAIADE

NAIADE is based on the Social Multicriteria Evaluation approach, developed by Munda [6, 7, 8] as a framework for the application of social choice in complex political problems, with the aim of introducing the political constrains, interest groups and collusion effects. There are many applications of this method in urban and territorial transformations where exist conflicts between different groups and competing values and interests [9, 10, 11, 16, 20].

This method implies two types of evaluations: 1) A technical evaluation, that is based on the score values assigned to the criteria of each alternative and is performed using an impact matrix (alternatives vs criteria); 2) A social evaluation that analyses conflicts among the different interest groups and, studies the possible formation of coalitions among different stakeholders using an equity matrix, which provides a linguistic evaluation of alternatives by each group.

### **3. APPLICATION**

### **3.1.** Urban regeneration strategies

The paper applies the NAIADE methodology to assess six different urban regeneration strategies, considering their social impacts on the stakeholders involved in the process.

These strategies have been developed for the regeneration program "Collegno Rigenera" for the city of Collegno (Northen Italy). The program is promoted by the municipal administration and it is focused on the requalification of an abandoned brownfield area and the close natural park. The main aim is to find answers to the economic and social needs of the town, following the objective of "Collegno Social Town".

For these requests, the strategies are characterized as follows: 1) Cultural District, whose interventions are focused on the brownfield requalification to create new public spaces for the community; 2) Smart City, which focuses on providing the lack of service in order to connect this area with the bordering urban fabric; 3) Start Up, which plans to reuse the abandoned buildings to place new innovative activities; 4) City and Craft, which focuses its interventions

both on the park and on the existing economic activities in order to create a new urban park; 5) Sharing city, whose main intervention is to requalify the existing public spaces, with special attention to innovative shared solutions for living and working (such as: bike and car sharing, open wi-fi access, etc.); 6) City and Craft, whose intent is to reclaim the brownfield area to connect this area with the park.

#### 3.2. Stakeholders Analysis

Before applying NAIADE methodology, an in-depth Stakeholders analysis was performed to identify values and preferences and also to define the set of criteria used for the evaluation [12]. In the field of urban development, it is important to identify and analyse the interests of the stakeholders involved in the process to better focus on their needs and requirements and also to try to resolve possible conflicts among them [12, 13, 14]. In this evaluation the Stakeholders Circle Methodology has been used, because it allows the analysis of the behaviour and the role of the different stakeholders, depending on their characteristics [13]. This classification was necessary in order to identify which stakeholders to involve in evaluating the social impacts of the different strategies.

#### 3.4. Evaluation

The evaluation was developed through the impact and the equity matrix. A first technical ranking was obtained by the impact matrix which evaluates the the different scenarios according to a set of multidimensional criteria that include the relevant aspects of the decision problem, namely environmental impacts, social impacts and economic impacts. As shown in Figure 1, from the technical point of view the most preferred scenarios are "City and Craft" (D) and "Sharing City" (E) alternatives.



Fig. 1 Dendogram (left) and multi-ranking (right) (Source: Authors processing)

The Equity matrix illustrates the assessment for each scenario, expressed in qualitative scale by the involved stakeholders. In this case, following the NAIADE methodology, a multi-level scale has been used for the alternative evaluation, in which 9 qualitative points were considered: perfect, very good, good, more or less good, moderate, more or less bad, bad, very bad, extremely bad [7, 8, 9]. From this matrix distributional issues can be taken into account. Specifically, using a distance function  $d_{ij}$  as conflict indicator, a similarity matrix sij = 1/(1+dij) can be constructed for all possible pairs of groups, so that a clustering procedure is meaningful. By applying this procedure to the social impact matrix, a coalition dendrogram can be obtained (Fig. 1). The graph helps to visualize the actors' goals proximity and conflicts. As an example, Technical Office (G3) and Planners (G4), has a very high credibility (0,77) because both pursue the objective of the requalification of the area.

#### **3.5. Discussion of Results**

NAIADE method develops two different rankings [6, 7, 8]. From the technical point of view the best scenarios are "City and Craft" and "Sharing City", while from the social point of view the preferable strategy is "City and Craft" scenario (Fig.1). Considering that objective of this evaluation is to assess the different regeneration strategies considering their social impacts, the choice of the best alternative should be mediated between these two different rankings. For this reason, this application develops a comparison and mediation between these, obtaining a multi-ranking evaluation (Fig.1). according to the results of the evaluation, the preferable scenario is "City and Craft", because it can combine both the technical and the social performances in order to maximize the social impacts.

#### 4. CONCLUSIONS

This application underlines the importance of considering the social impacts on the stakeholders involved in urban regeneration process during the evaluation. It also underlines that in urban regeneration process the involvement and the participation of the stakeholders is a necessary requirement to obtain social sustainability and to promote consensus solutions [15]. The main strength of using NAIADE method for our purpose is represented by the social impact matrix and coalition dendrogram. In fact, in the equity matrix the alternatives have been evaluated considering their social impacts by the same stakeholders, while the dendogram shows the coalition from a social point of view.

The results obtained are highly coherent and the approach has proven strength. Future work and researches could explore a more formal interaction among the two rankings [9] and develop a specific sensitivity on the technical ranking. These advancements could better verify the evaluation in order to have more robust result to formulate the recommendation for the DMs. The findings of this research provide insight into the evaluation of the social impacts due to urban regeneration processes.

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