

Urban Regeneration Strategies for Implementing the Circular City Model: The Key Role of the Community Engagement

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Abstract. In an increasingly urbanized world such as the one we are living in today, the future of humanity is closely linked to cities, as also highlighted by the United Nations. The challenges of sustainable development are concentrated in the cities and thus the way they are planned and managed impacts the quality of life of the citizens who live in them. In this framework, the circular city model can contribute to operationalize the principles of sustainable development. By leveraging urban planning in urban regeneration as a tool for change, cities can transform their processes from linear to circular ones. This study presents the results of the URBES (Urban Regeneration and Best Energy Saving for our Cities) Erasmus+ project, coordinated by Pegaso Telematic University (Italy). In particular, the aim of the paper is to identify project alternatives for the regeneration of four case studies in the circular city model perspective, highlighting the key role of the community engagement. To this end, a questionnaire has been developed for the community to support the decision-making process. In particular, this process has put schools at its heart, with the awareness of the key role of the community engagement and that the circular economy model can be successful if it is supported from the bottom up and, thus, if it is supported by a strong cultural base.

Keywords: Urban regeneration · Circular city · Participatory processes

1 Introduction

As also highlighted by the United Nations, in an increasingly urbanized world such as the one we live in today, the future of humanity is closely linked to the cities [1]. Indeed, the main challenges of sustainable development, namely social inequalities, environmental degradation and economic crisis are concentrated in cities. Along with the growth of social inequalities, climate change is the most significant challenge facing the world in the 21st century.

A large number of resources are consumed in cities (which cover 3% of the earth's surface) with negative effects in terms of pollutants and climate alteration: cities are home to more than half of the world's population [2], consume 78% of the world's

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energy, produce more than 60% of greenhouse gas emissions and 50% of global waste [3]. Nevertheless, at the same time, cities are the places where wealth is produced and economic, social, environmental and cultural systems are interrelated, making the city a complex system [4]. Climate change is a natural phenomenon that has physical and meteorological effects and will impact not only the present but also future generations' health and wellbeing. It also poses a threat to the health of Mother Earth on which everything depends [5].

The rate at which climate change is proceeding exceeds humans' ability to react, which is often slow and ineffective. Bridging the gap between this status quo and a more desirable future is our primary challenge. The UN Agenda 2030 outlines a vision of a desirable future by setting 17 Strategic Goals (SDGs) to address the challenges of the 21st century [6], highlighting the necessity to shift towards a new paradigm: humanistic and ecological paradigm.

The SDGs goals are achievable in cities that, thus, play a key role in reaching sustainable development. The New Urban Agenda [7] represents the "spatial translation" of the above goals into physical space within cities. It promotes a shared vision about the urban development, rethinking the way of planning and managing cities for integrating and combining the dimensions of sustainable development, that is the economic, social, cultural and environmental dimensions.

The way cities are planned and managed impacts the quality of life of the citizens who live in them.

The document by which Europe has incorporated the United Nations' principles for achieving sustainable development is the Amsterdam Pact, a document that highlights the key role of adopting nature-based solutions and the circular economy in urban development [8].

Indeed, the linear economy model has been shown to be inefficient: it consumes natural resources and produces waste and degradation. In other words, it is unsustainable. So, a new economy model is required. In this perspective, the circular economy model is addressed in this study.

This research work is part of the URBES project, an European Erasmus+ project started in 2019 and ended in 2022, coordinated by Pegaso Telematic University, the 2nd Geniko Lykeio of Arta (Greece), the Kocasinan Anadolu Lisesi High School (Turkey), the Colegiul Vasile Lovinescu High School (Romania), the Sabatini Menna Artistic High School (Italy) and the BIMED Italia Association. The aim of the project has been to promote and connect the different cultural identities (of the four partner countries) to encourage cultural exchange.

Within this framework, the objective of the paper is to identify project alternatives for the implementation of the circular city model considering the key role that the community plays in the decision-making process. In particular, this work puts schools at its heart, with the awareness that the circular model can be successful if it is supported from the bottom up and thus if it is supported by a strong cultural base. Schools, in fact, are the places of condensation of citizenship, places of training in citizenship, that is, in collaboration and cooperation.

The paper is organized as follows: after the introduction in Sect. 1, the urban regeneration issue is addressed in Sect. 2, also identifying some good practices with a particular

focus on the participatory processes. Section 3 shows the methodology. Then, in Sect. 4, four case studies of urban regeneration (identified with the involved schools) are presented. In Sect. 4, the participatory process is explained, describing also the survey conducted with the community. In Sect. 5 the results of the survey are discussed and the preferable project alternatives for the four urban regeneration case studies are defined. Finally, in Sect. 6 discussions are presented.

2 Urban Regeneration and the Circular Economy Model

The circular economy model, also endorsed by the United Nations both in Agenda 2030 and more explicitly in the New Urban Agenda, aims to implement sustainable development principles by following the concept that nothing in nature is wasted and everything can be used as a resource [9]. The goal of the circular economy is to maximize the value of products and materials by focusing on their entire life cycle, with the aim of "closing the loops" by reusing all waste as a resource for new production cycles.

The spatialization of the circular economy model is represented by the circular city model [10]. Several cities are embracing the circular economy as a development model and defining themselves as "circular cities" [11–15]. Cities such as London, Amsterdam, Rotterdam, Brussels, and Paris are some leading examples of this model in Europe [16].

These cities recognize the importance of mimicking natural systems and are taking strategic actions to transform their processes from linear to circular. These actions span across different sectors, including construction, agri-food, textiles, and more. However, the transition to a circular city model requires a systemic change that goes beyond technical solutions issues (as emerges from most of the good practices of circular cities). Urban planning can play a key role in promoting spatial proximity between resource flows, flexibility of buildings and spaces, and the incorporation of green spaces, among other initiatives that are fundamental to operationalize this urban development model [17].

By leveraging urban planning in city regeneration as a tool for change, cities can transform their organization, economy, community, and governance from linear into circular. The first studies on the concept of urban regeneration were initiated in the 19th century during the Victorian era in the United Kingdom as an attempt to improve the poor living conditions in cities caused by industrialization. The economic shift towards the peripheries of cities in the 1970 s resulted in many urban centers experiencing unemployment, inadequate quality of services and housing, street degradation, and public space neglect, which impeded the potential development of urban centers.

Today, urban regeneration is understood as a new strategy for urban development that can effectively improve the physical environment of cities, stimulate economic growth and preserve cultural heritage [18].

In terms of territorial dimension, empty, abandoned, or degraded spaces may not be visible or attractive, but they hold potential resources for the regeneration and self-sustainability of cities and regions. By creatively redesigning these spaces for new purposes, their actual and potential values can be brought to light and revitalized [19]. This is in line with the principles of the circular economy.

Urban regeneration projects can encompass interventions at the micro, meso, and macro scales, involving the revitalization of entire neighbourhoods, unused ancient buildings, abandoned industrial areas, and more. Urban regeneration aims to restore underutilized areas and redistribute opportunities, ultimately enhancing urban prosperity and improving the quality of life.

Scholars and researchers have examined urban regeneration from different perspectives. The literature on urban regeneration is diverse and multifaceted, reflecting the complex nature of the concept. It encompasses economic, social, environmental, and governance perspectives, emphasizing the need for integrated and sustainable approaches to revitalizing urban areas.

One important strand of literature focuses on the economic aspects of urban regeneration. It explores how regeneration projects can stimulate economic growth, attract investments, and create job opportunities in urban areas. Studies often analyze the role of public-private partnerships, financial instruments, and the impact of urban regeneration on local economies [20, 21].

Another significant line of the literature is on the social dimensions of urban regeneration. This includes topics such as community engagement, social cohesion, and the impacts of regeneration on vulnerable groups. Researchers investigate the effectiveness of participatory approaches, community empowerment, and inclusive development strategies in achieving social sustainability and improving the quality of life for residents [22, 23].

Furthermore, the environmental dimension of urban regeneration has gained attention in recent years. This literature focuses on sustainable development, green infrastructure, and the promotion of environmentally friendly practices in urban regeneration projects. It explores concepts such as eco-districts, brownfield redevelopment, and the integration of renewable energy sources to create more sustainable and resilient urban environments [24, 25].

Urban governance and policy play a crucial role in shaping urban regeneration processes. A significant strand of literature examines the role of planning policies, regulatory frameworks, and institutional arrangements in encouraging effective urban regeneration. It also considers issues of power dynamics, stakeholder collaboration, and the role of local government in driving successful regeneration initiatives [26, 27]. Case studies and comparative analyses have been conducted to examine urban regeneration projects in different contexts worldwide. These studies provide insights into the success factors, challenges, and lessons learned from specific regeneration initiatives, ranging from large-scale urban redevelopment projects to small-scale community-led interventions [28, 29].

Over time, several guidelines and laws have been established to facilitate the processes of urban regeneration in cities. One example is the "Toledo Declaration" (2010), which emphasizes the strategic significance of "integrated urban regeneration", i.e. a collaborative alliance among all stakeholders that are involved in the city-building process [30].

UN-Habitat develops various manuals and reports to guide urban regeneration projects, aiming to ensure that new city development initiatives can enhance economic

accessibility, service provision, and engage local residents to promote local economic development [31].

The World Bank identifies different steps to carry out a successful urban regeneration project. The first step involves a scoping exercise, which entails engaging various stakeholders in specific meetings to determine the strategies to be implemented. The second step focuses on designing a web of actions and institutions, which involves establishing long-term development actions with the involved institutions. The third step revolves around fundraising, which can involve both private and public sources of funding. The final phase is the actual development of the project idea [32].

2.1 The Role of Participation in Urban Regeneration Processes

Citizen participation is a key component in urban regeneration projects, as it allows for the involvement of local communities in the decision-making processes and helps ensure that the project contribute to meet their needs and desires and, at the same time, reduce the conflicts among different point of views and interests. In addition, participation can promote social cohesion, build trust between different stakeholders, and increase the overall success and sustainability of the project. Healey in 1997 argued that participation can take many different forms, ranging from public consultations and workshops to more formalized forms of co-governance and co-production. Regardless of the specific form it takes, participation serves a number of important functions in urban regeneration projects [33–35]. By engaging with citizens and taking their views and concerns into account, urban regeneration projects can build greater legitimacy and support among local residents [36]. Furthermore, participation can help ensure that urban regeneration projects are more grounded in the local context and better aligned with local needs [37]. Moreover, participation can bring diverse perspectives and ideas to the table, which can help generate new and innovative solutions to complex urban challenges. By engaging with citizens and other stakeholders in collaborative and creative processes, urban regeneration projects can benefit from a wider range of insights and expertise [38].

Additionally, participation can help empower local communities by giving them a greater voice in decision-making processes and enabling them to play a more active role in shaping their own urban environments. This can help build greater resilience and capacity among local communities, as they are better equipped to respond to future challenges and changes [39, 40].

The project of urban regeneration influences the future of our cities and need clear and transparent tools to manage the conflict between public and private interests [41]. For this reason, in a lot of cities all over the world are activated participation processes to support the urban regeneration project during all the design phases. The actors involved in urban regeneration processes are citizens, associations in the area, governance, entrepreneurs, schools, etc.

The adoption of a participatory approach should guarantee the achievement of objectives that are coherent and responsive to the different territorial realities [42–44]. In the idea of participation referred to, the involvement of all social actors is essential, through a process that is fully inclusive and not limited to social categories or economic groups and/or organised groups and associations. This process should not be limited to the aspects of information and consultation but should have a character of continuity.

The participatory processes activate a process that aims to understand, listen, reason together, and discuss choices from the very beginning of the processes.

In Europe, there are various cities that have invested in urban regeneration projects, which can serve as good practices. Most often, these cities are port cities that are undertaking projects to redevelop small industrial districts along waterfronts [45]. There are many good practices of circular urban regeneration in which the participatory process has played a fundamental role, such as the Buiksloterham and De Ceuvel neighborhoods in Amsterdam [46], the reuse projects of HAKA-building boasts, Van Nelle Fabriek, and Venlo building in Rotterdam [47], the "Port House" project designed by Zaha Hadid in the Eilandje quarter in Antwerp [48], the reuse project of the Elbphilharmonie building in Hamburg port area [49], the industrial symbiosis processes activated in the port area of the city of Marseille [50] and the regeneration of Baxia Chado historic neighborhood in Lisbon [51].

3 Methodology

This research work, as anticipated in paragraph 1, is part of the URBES project. This project has been organized in five steps (see Fig. 1).

The first step has focused on analyzing the literature review and case studies on urban regeneration, also identifying good practices.

The second step has concentrated on selecting the case studies on which to carry out the decision-making process for urban regeneration, starting from the involvement of schools. In particular, within the four partner cities of the URBES project, workshops have been organized to discuss and identify case studies together. At the end of this step, the following case studies have been selected: Church of the Former Interdiocesan Seminary of Salerno (Italy), Castle of Arta (Greece); Autogării neighborhood (Romania), Seyyid Burhanettin Mosque (Turkey).

The third step has been related to analyzing the aforementioned case studies. This analysis aimed to develop the knowledge framework of pilot studies in order to identify criticalities and potential for supporting and orienting project choices.

In the fourth step, a participatory process has been activated in order to involve different stakeholders in the decision-making process to identify new project functions according to their needs, requirements, and desires. To this end, a survey has been developed with the community, through the submission of a questionnaire. It will be analyzed in the following paragraphs.

The last step, starting from the analysis of the results of the questionnaires (one for each case study) and the criticality and potential emerged from the third step, has aimed to determine the functions to be assigned to the four case studies and to define the preferable alternative projects.

The project was characterized by a strong dissemination process. In fact, students produced specific short films to share the results of the project and the various issues that emerged. They also developed an illustrative app to showcase the four projects. Furthermore, two international conferences were organized (the first one in Greece in November 2021 and the second one in Italy in November 2022) to share and discuss the project results. Finally, the entire project was also shared on some European platforms

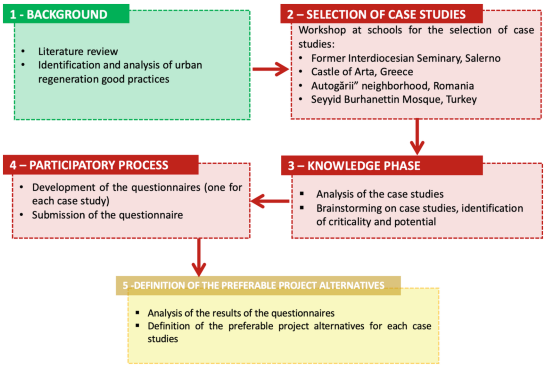

Fig. 1. The methodological framework

associated with the Erasmus+ Program. In addition to virtual collaboration, the project facilitated the mobility of professors, researchers and students. Four mobility events were organized in each partner country to discuss issues related to urban and environmental transformation.

4 The Selected Case Studies: An Overview

As described in the previous section, four case studies of urban regeneration have been identified by students and teachers from the four schools involved, with the support of university researchers.

The artistic high school Sabatini Menna in Salerno (Italy) identified the Church of the Former Interdiocesan Seminary of Salerno as a case study (see Fig. 2).



Fig. 2. Church of the Former Interdiocesan Seminary of Salerno, Italy

The Seminary, which served as the regional seminary headquarters, was constructed in 1929 by the bishops to the north of the city. Due to its grandeur, it represented the largest building project ever undertaken in Salerno.

In 1976, the Municipality of Salerno purchased the Seminary, and since then, the complex has been used for various purposes. Initially, a portion of the structure was used as the University headquarters, and currently, it houses the Art School Sabbatini Menna,

the Arts theater, and an urban park. Despite its previous uses, the seminary buildings are now abandoned and in a poor state of conservation.

The case study chosen by the Art School (Greece) was the castle of Arta, Greece (see Fig. 3), whose construction dates back to the Middle Ages.

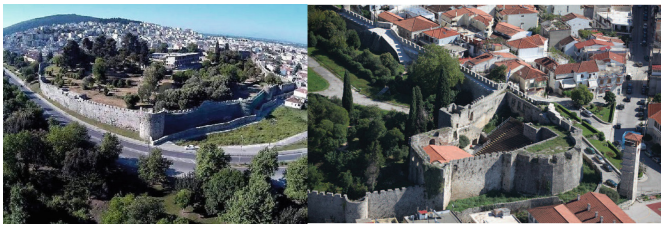

Fig. 3. The Castle of Arta, Greece

In the past, it served as the administrative and military center of the town, housing the rulers' palace and various religious buildings representing different ethnicities that had control over it.

During ancient times, there was no castle, but instead, an impressive fortification wall was constructed with neatly stacked stones. Subsequently, a castle was built within these walls, providing protection for the citizens during medieval invasions. Later, as part of a tourist development program for the area, a hotel was constructed within the walls. The surrounding area was enhanced with paths, gardens, stone stairs, terraces, and two tennis courts. Numerous trees were also planted, completely transforming the interior of the castle. The hotel played a significant role in the town's social life until 1992 when it ceased operations. Until then, it had attracted a large number of tourists and served as a center for leisure and entertainment for locals. Currently, the hotel is in a state of degradation and abandonment, and citizens no longer have access to its areas.

The case study selected by Fatilcenti school was the Autogării neighborhood in Romania (see Fig. 4).



Fig. 4. Autogării neighborhood, Romania

This neighborhood is located relatively centrally in Falticeni. This area serves as a transitional zone characterized by some commercial activity, a few bus stops, and several abandoned buildings. Within this area, a power plant was constructed, which ceased operations after the Second World War, having been in operation for over five decades. Adjacent to the power plant, housing units were built, which are currently abandoned.

In the year 2000, the Municipality initiated a regeneration project for this area, building apartments intended for student accommodation and a commercial zone. Over time, improvements have been made to the conditions of access and parking. However, despite these interventions, the area is still regarded as marginalized and unsafe.

Lastly, the Turkish school identified the redevelopment of the Seyyid Burhanettin Mosque as its case study (see Fig. 5).



Fig. 5. Seyyid Burhanettin Mosque

The mosque, constructed in 1797 near the historical center of Seyyid Burhaneddin city, is situated on a campus that encompasses a cemetery, a tomb, and another larger and older mosque known as Kalemkırdı. Spanning an area of 200 square meters, it continues to be utilized for public worship. However, the maintenance of the building is not optimal. Presently, the Municipality oversees its management, and it serves as a tourist attraction in the area.

As can be seen, they case studies are referred to three buildings and one neighborhood, highlighting the capacity to the circular economy to be operationalized at different scale.

5 The Participatory Process

The participatory process has been initiated for each school separately. Each school organized an initial meeting with various stakeholders, including other students, teachers, some municipal representatives, and sector associations. These meetings have served as moments of dialogue and discussion on the selected project area to identify the issues to be addressed through the survey.

A questionnaire has been then developed (one for each case study) aimed at identifying possible functions for the regeneration of the studied areas/buildings. The objective of the questionnaire was to gather needs and requirements of different stakeholders linked to the urban regeneration process and to understand their awareness about sustainability issue.

The questionnaire developed by each school has been administered over a period of approximately 2 months (from October to December 2020) to around 200 users each. It has been distributed in both paper and online form, through Google Forms. The paper format, distributed within the schools and through personal meetings with the community, has been the most successful in terms of collecting the highest number of responses.

The questionnaire has been divided into four sections, totalling 45 multiple-choice and open-ended questions, some of which including a space for respondents to explain their chosen option or provide suggestions and opinions.

The first section included questions to identify the interviewees' demographic information: age, profession, and level of education.

The second section consisted of questions aimed at understanding the interviewees' knowledge and awareness about environmental issues. For example, the questionnaire explored the interviewees' personal actions taken to protect the environment, identified major sources of pollution, assessed their perception of pollution in their city, and identified potential actions to raise awareness about sustainability and the environment.

In the third section, specific questions have been asked to identify the areas that, according to the interviewees, were the most degraded, with the objective of confirming the study area chosen in the first phase. Subsequently, they were asked if they had participated in decision-making processes related to other urban regeneration projects. Furthermore, some questions have investigated subjective aspects to assess the residents' perception of certain areas in their city.

The fourth section involves an investigation into how the interviewees assess the neighborhood or building to be regenerated in terms of accessibility, maintenance status, and offered services. They were asked if the selected areas hold any particular value for them, how involved they feel in the neighborhood's life, and what new functions they consider necessary for the building/neighborhood regeneration project.

6 Results: Analysis of the Questionnaires and Definition of the Project Alternatives

After the analysis and participatory phases, the co-design process to define the project alternatives has started. These alternatives have been identified by the students of the four school partners of the project with the support of researchers from Pegaso Telematic University.

At the end of the questionnaire submission process, Pegaso Telematic University and BIMED Association have analyzed the results and shared them with the students.

A number of important issues came up during this analysis about the four areas, their surroundings, and how the community perceives them. These findings provide useful information to orient design choices.

6.1 Former Interdiocesan Seminary in Salerno: Results

Regarding the Salerno case study, starting from the results of the questionnaire, the students have identified new functions for the reuse of the former Seminary's ecclesiastical building. The emerged preferable functions have been: info-point, health services,

conference room, exhibition room, reading room, neighborhood library, an area for workshops, indoor play area, service center, and small bar. These functions are in line with the criticality emerged from the analysis phase in which they resulted lacking in the neighborhood.

In relation to the interviewee's awareness about sustainability issue, it was deemed satisfactory. In fact, in the open-ended answers, the respondents have suggested the use of technologies for improving the environmental sustainability of the building. The proposed technologies have been the following: innovative and green materials and technologies, green energy, water recovery systems, and home automation system. These design choices are closely linked to the new European Bauhaus principles, which recognizes that cultural heritage and historical monuments can contribute to achieve sustainable development goals by making them part of the green transition.

Starting from the above, the students have developed (with the support of the university researchers) the reuse project including the community point of view, that is integrating expert and community knowledge.

The objective of the project has been to bring back to life the Seminary building, providing functions for promoting inclusiveness and reducing the environmental impact (through the use renewable and clean energy).

The project has been careful to preserve the specific features of the building while changing its use value. It provides to maintain the spatial configuration of the Church, preserve the altar, and plan for the restoration of the wall paintings. By changing the function of the building (its use value), it is kept alive, which otherwise, in a state of abandonment, would have become "waste" (this is in line with the principle of circular economy to prolong the useful life of resources and reduce waste) [52, 53].

The building provides a range of different functions, including educational spaces such as labs, a neighborhood library, elderly care centers, indoor play areas, and spaces for temporary exhibitions, which will be used by both the inhabitants of the neighborhood and the city and the students from the art school. The reuse of buildings with a combination of functions (mixité) and flexible spaces is a characteristic of the circular economy model that is dynamic and allows for adaptation over time.

Subsequently, consistent with SDG 12, with regards to the energy upgrading of the building, the project has proposed the use of windows with thermal insulating glass, the construction of a new thermal insulating roof with the integration of photovoltaic tiles, and the use of plasters made of lime and hemp, which are rich in natural and thermoacoustic insulating properties.

To ensure inclusive access to the building spaces, the project has planned to connect the main entrance to the Church with the Seminary Park through stairways equipped with stairlifts. Additionally, the new multi-storey parking lot of the former Church will be equipped with a lift. In order to guarantee a sustainable mobility to reach the building, a bike sharing point near the Church has been planned (according to the 3, 7, 9 ,11, 13 SDGs).

This is also consistent with the principles of the "New European Bauhaus" launched-to by the European Commission in 2020, and the "New Green Deal" [54]. In particular, the public garden has been equipped with "smog eating" plant species in order to better

the air quality. Furthermore, flowers of Mediterranean vegetation have been planted, that is plans linked to the local vegetation.

6.2 The Castle of Arta, Grecia: Results

Regarding the Greece case study, starting from the questionnaire, some functions have emerged to reuse the abandoned hotel and to improve the area surrounding the castle ruins (40 hectares) in order to return these now abandoned spaces to the community and make the place a tourist attraction. In particular, these functions have resulted from the survey: an equipped urban park, leisure facilities, a shopping centre, new housing, a children's playground areas (interactive educational), an outdoor cinema. Alongside these functions, some suggestions to improve the area have been proposed: pedestrian upgrade, maintenance of neoclassicals ruins, the construction of pedestrian paths for visiting the archaeological site, the restoration of the existing outdoor theater, the installation of new benches and new lights.

Moreover, respondents stated the need to reconvert the ex-hotel with more attractive functions, such as a cultural center, areas for permanent exhibitions, conference halls, info points for tourists, small stores selling local products, bar and restaurants repurposing byzantine and ottoman recipes. These last two functions highlight the respondents' desire to keep the local culture and history of the place alive while changing the original function of the building.

The interviewees demonstrated a satisfactory level of awareness regarding sustainability issues. They provided interesting suggestions related to the use of innovative and green materials, green energy, water recovery systems.

All these suggestions have been included in the project developed by the students and university researchers. The overall aim of the project has been, as said before, to return this large area to the community and, at the same time, to preserve the historical value and cultural identity of the place and the existing building. Therefore, the project has proposed the redevelopment of the entire park and the recovering of the castle archaeological ruins.

A cycle path connecting the castle park, runs along the castle's outer walls and reaches the historic centre have been proposed to improve the accessibility to the site and the connection with the city. Furthermore, the project includes the installation of telescopes on the castle walls to provide a top-down view of the city. Also a playground for children, an outdoor gym, and an open-air cinema contribute to the redevelopment of the park. Its usability and aesthetic attractiveness have been also improved by new benches and fountains, new lighting system and information panels sharing information on the history of the castle. The installation of these panels contributes to preserve and disseminate the history and identity of the place, both to current and future generations.

With regard to the redevelopment of the hotel, the priority intervention has been the consolidation of the building's structures. Furthermore, in line with the results of the questionnaire, a cultural centre has been provided. The latter included also the following functions: bar and restaurant serving dishes of local tradition (Byzantine and Ottoman tradition), a small shop for the sale of local products, an info point for visitors, a conference room, and an exhibition hall.

6.3 Autogării Neighborhood Romania: Results

By thoroughly analyzing the questionnaire results, the new functions for the regeneration of Autogării neighborhood, characterized by small residential buildings, disused industrial constructions, two dismissed shopping centers, the rehabilitation of an open-air market, and a closed school were determined to improve the area. These spaces therefore represent "waste" to be reintroduced into the loops, that is, to be brought back to life (circular economy principles) [55, 56].

The new functions for these spaces emerged from the questionnaire have included green spaces (planting new trees), equipped urban park, areas for sports and leisure, new streets to divert heavy traffic outside the district, new modern bus station, a system for better management of selective waste collection, new connections between the neighborhood and the center. Furthermore, other significant inputs have emerged from the survey. In particular, the modernization of existing buildings, the allocation of new functions for unused buildings, the restoration of a few old buildings in the area, and the improvement of the lighting of streets and green areas have been suggested from the respondents.

Regarding the interviewees' awareness about sustainability issues, it results to be satisfactory. Several sustainable technologies have been suggested to be implemented in the project. They included the use of innovative and eco-friendly materials and technologies, the adoption of green energy sources. Moreover, the necessity of achieving building energy autonomy, implementing water recovery systems, and promoting the recycling of urban waste have been highlighted (this allows the achievement, in particular, of the 12 SDG).

All these suggestions have been included in the project developed by the students (with the support of the university researcher as for the other case studies). The priority actions emerged from the questionnaire have been: the facade restoration of the small buildings that are still active, the attribution of new functions to the abandoned houses and disused industrial buildings (in line with the circular economy principles). To improve the connection of this area with the historic city center, the project has proposed the establishment of two bus stations and the cycle path (9, 12 SDG).

In the disused industrial buildings, new factions, in line with the results of the questionnaire, have been allocated by the project: two commercial centers, a cinema, a theater, a spa, green areas, co-working areas, and areas for exhibitions and events. Furthermore, the design project has included also various functions aimed at enhancing the urban environment, in line with many goals of the SDGs. These elements encompassed an urban park, new electric vehicle charging stations, an open-air market, new pedestrian pathways, new facilities for tertiary activities, new urban waste collection system, children's playground, and green interventions for existing buildings.

As in the previous case study, but at different scale (from building to city neighborhood), the project actions, identified through a synergic cooperation among common and expert knowledge, contribute to the achievement of the principles of the circular economy model. In particular, the reuse of "waste" areas/building, the provision of functions encouraging social inclusion and the adoption of green solutions and sustainable energy systems and technologies are in line with the principle of this new urban development model.

6.4 Seyyid Burhanettin Mosque, Turkey: Results

From the analysis of the questionnaires submitted by the Turkish school for the regeneration of Seyyid Burhanettin Mosque, various new functions to valorize the building and to improve its usability have emerged.

The existing function (the religious one) has been conserved, but it has been integrated with the provision of services to support the enjoyment of the mosque. In particular, the respondents have suggested restoring all the indoor spaces through the realization of new toilets and washrooms, waste collection boxes, a rest for coffins, an additional entrance for women. Furthermore, some suggestions for the restoration of the mosque emerged, as to install an underfloor heating system, to use of insulating paint, to enlarge and illuminate the women's area, to cover the floor with a more comfortable material, to use more energy-efficient light. About the requalification of the outdoor spaces, the respondents highlight the necessity to extend green areas, to plant further trees, to add recycling box and areas for feeding, watering and sheltering the animals.

The interviewees demonstrated a satisfactory level of awareness about sustainability issues. They provided valuable suggestions for incorporating various sustainable technologies into the project, as covering the building with insulated and natural materials, installing heating insulation, adding solar panels for heating the water, installing rainwater collector system to water the plants in the garden. This is in line with the principles of the New European Bauhaus that recognize the possible contribution of cultural heritage to green transition. This is also a characteristic of the circular city model [54]. Starting from the above suggestions and the issues emerged from the analysis phase, supported by the university researchers, the students developed the project. It has been coherent with the inputs from the questionnaire. The project has, for example, provided a specific room as a resting place during funeral prayers, as well as toilets (which were not present before) that are essential during prayer times. The entire building and roof have been insulated to improve heating and prevent energy and moisture loss. A rainwater recovery system has also been planned. Furthermore, the project has included the construction of an external area for prayer (covered with a removable canopy). On the roof of the mosque, 82 solar panels to generate electricity and hot water have been planned. Some interventions on the façade have been proposed to improve the visibility of the mosque to the citizens. For example, it was planned to replace the existing windows with wider ones, and to build a dome with colored glass so that light reaches the holy places. This contributes to strengthening the identity of the mosque, which is an important reference for the community.

7 Discussions and Conclusions

The findings of this study highlight the key role of the participatory processes in urban regeneration projects in order to bring the views, needs, and requirements of all stakeholders into the decision-making processes. Through the questionnaire administered to the community, it has been evident that involving local residents and other stakeholders can lead to more successful and shared outcomes that are better aligned with the needs and preferences of the community. Furthermore, participation allows to reduce the conflicts among different point of views and interests at stake [57, 58].

The results of this study also highlight the importance of effective communication and transparency throughout the urban regeneration process, through the integration of expert and common knowledge in a circular perspective, that is reciprocally ex-changing knowledge. By providing clear and accessible information to the community, and involving them in discussions and decision-making, it is possible to build trust and create a sense of ownership among different stakeholders. Overall, this study demonstrates that participation should be considered as an integral part of any urban regeneration project, rather than an optional add-on. By engaging with the community in a meaningful and inclusive way, urban planners and policymakers can ensure that regeneration projects are not only successful, but also sustainable and socially responsible.

It is important to recognize that community participation is not a one-time event, but a continuous process that requires ongoing communication and engagement with stakeholders throughout the project lifecycle.

While community participation can increase the social acceptance and sustainability of urban regeneration projects, it is important to balance the needs and perspectives of different stakeholders, including residents, business owners, and local authorities.

The use of a questionnaire as a tool for community participation can be effective in gathering quantitative data on community preferences and priorities, but it is important to complement this with qualitative data that can be deduced by different methodology, such as focus groups or interviews to capture more in-depth insights and perspectives. Community participation can help to build trust and transparency between project promoters and the local community, which can be particularly important in the context in which interests are conflictual.

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