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New Metropolitan Perspectives

Knowledge Dynamics and
Innovation-driven Policies Towards
Urban and Regional Transition Volume 2



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New Metropolitan Perspectives

Knowledge Dynamics and Innovation-driven
Policies Towards Urban and Regional
Transition Volume 2

 Springer

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Preface

This volume contains the proceedings for the Fourth International “*NEW METROPOLITAN PERSPECTIVES. Knowledge Dynamics and Innovation-driven Policies Towards Urban and Regional Transition*”, scheduled from 26 to 28 May 2020, in Reggio Calabria, Italy.

The Symposium was jointly promoted by LaborEst (Evaluation and Economic Appraisal Lab) and CLUDs (Commercial Local Urban Districts Lab), laboratories of the PAU Department, *Mediterranea* University of Reggio Calabria, Italy, in partnership with a qualified international network of academic institution and scientific societies.

The fourth edition of “*NEW METROPOLITAN PERSPECTIVES*”, like the previous ones, aimed to deepen those factors which contribute to increase cities and territories’ attractiveness, with both theoretical studies and tangible applications.

When the call for papers of New Metropolitan Perspectives was launched in September 2019, no one could imagine that in a few months we would find ourselves suddenly catapulted into a totally unknown future. And the papers sent in January 2020, of course, could not in any way reflect the dynamics caused by the spread of COVID-19, the outlines of which will all be discovered and deepened in the coming years: it is still too early to fully understand the extent of these changes.

Today, we are still dealing with what appears to be a cataclysm of planetary proportions; it will take time to “historicise” events and interpret their profound meaning and long-term impact, through the multi-level observation—through the interpretation of macro-data and the in-depth investigation of the different realities involved—that the scientific community will be able to develop when the health emergency is over. At that point, the scenarios can begin to be configured with scientific rigour, which are beginning to be intuitively delineated in constant events. It will be possible to appreciate the permanent (real and perceived) effects on the daily life of communities, on the organisation of work and logistics chains and in the system of social relations.

At present, we can only hypothesise scenarios, more or less well founded.

The common thread that linked the different themes from the Symposium in its original conception was technology, in particular the effects produced on the settlement systems by the relationship between man and technology, in two different aspects: the progressive replacement of man with machines in practically all production processes and the spread of ICT.

The pandemic and the policies and practices put in place to contain the infection have brought this issue to the fore with arrogance. The replacement of physical interactions with “virtual” contacts has used consolidated technologies but has accentuated their pervasiveness, generating impacts of a different nature. The next few months will tell us how much of this acceleration will persist in our daily lives and how much it will be a transitory phenomenon.

Permanent changes are conceivable, for example, in the organisation of work, with the adoption of smart working as an ordinary way of carrying out the various tasks, also in areas where until a few months ago it seemed a distant future, such as in teaching.

And these changes will probably also affect other areas, just think of the use of culture, in a broad sense, as the many virtual opening initiatives of museums and sites of cultural interest have shown us in this period.

As well as central issues for democratic systems will be those related to the use of big data and their impact on individual freedoms: the ongoing debate on tracking movements and personal preferences is extremely topical.

However, the data that seems to emerge with greater force from the phase we are experiencing is the progressive loss of relevance of the location factor: the pandemic has made even more evident the fall of many barriers to the global dimension of relationships and exchanges. This change brings with it, as a consequence, a change also on the plane of centre–periphery dualism: what is centre and what is periphery, when the two terms no longer refer to accessibility to physical places but, for example, accessibility to goods and services and, ultimately, to knowledge? And how do you measure accessibility if you can no longer measure in metres or hours?

The other phenomenon on which it will be increasingly necessary to reflect in future is the speed of changes. As already underlined on the occasion of the past edition of the Symposium, while society evolves with accelerations impressed by endogenous and exogenous factors (such as the pandemic COVID-19), the physical dimension of space adapts with extended times.

At the dawn of the studies on the impacts of ICT on the city, the “wired city” studied by the research group of Corrado Beguinot was divided into a system of three cities: stone, relationships and experience. To harmonise the development times of the physical city with the “liquid” city of human relations is, after thirty years, still a priority.

So how will our cities and, more generally, the settlement systems on a planetary level record these changes? Will the trend towards population concentration persist in hyper-equipped and congested metropolitan areas or will we see reflux? New perspectives open up towards what are now considered peripheral areas (such as the inner areas so dear to our Master Edoardo Mollica), in which perhaps some

organisational processes are more easily managed and there are still values that could be appreciated by future generations?

The ethics of research, in the disciplinary sectors that the Symposium crosses, invites us to feed, with scientific rigour, policies and practices that make the territory more resilient and able to react effectively to events such as the pandemic that we are suffering in recent months: we hope to know the outcomes of these courses in the next editions of the New Metropolitan Perspectives Symposium.

For this edition, meanwhile, approximately 230 papers published allowed us to develop 6 macro-topics, about “*Knowledge Dynamics and Innovation-driven Policies Towards Urban and Regional Transition*” as follows:

- 1 - Inner and marginalised areas’ local development to re-balance territorial inequalities
- 2 - Knowledge and innovation ecosystem for urban regeneration and resilience
- 3 - Metropolitan cities and territorial dynamics. Rules, governance, economy, society
- 4 - Green buildings, post-carbon city and ecosystem services
- 5 - Infrastructures and spatial information systems
- 6 - Cultural heritage: conservation, enhancement and management

And a special section, *Rhegion United Nations 2020–2030*, chaired by our colleague Stefano Aragona.

We are pleased that the International Symposium NMP, thanks to its interdisciplinary character, stimulated growing interests and approvals from the scientific community, at the national and international levels.

We would like to take this opportunity, together with Carmelina Bevilacqua and the CLUDs Lab team, to thank all who have contributed to the success of the Third International Symposium “NEW METROPOLITAN PERSPECTIVES. *Knowledge Dynamics and Innovation-driven Policies Towards Urban and Regional Transition*”: authors, keynote speakers, session chairs, referees, the scientific committee and the scientific partners, participants, student volunteers and those ones that with different roles have contributed to the dissemination and the success of the Symposium; a special thank goes to the “Associazione ASTRI”, particularly to Giuseppina Cassalia and Angela Viglianisi, together with Immacolata Lorè, Tiziana Meduri and Alessandro Rugolo, for technical and organisational support activities: without them, the Symposium could not have place; obviously, we would like to thank the academic representatives of the Mediterranea University of Reggio Calabria too: Rector Prof. Marcello Zimbone; responsible of internationalisation Prof. Francesco Morabito; and Chief of PAU Department Prof. Tommaso Manfredi.

Thank you very much for your support.

Last but not least, we would like to thank Springer for the support in the conference proceedings publication.

Francesco Calabrò
Lucia Della Spina

Cities and Regions Towards Transition

The fourth edition of the New Metropolitan Perspective Symposium took place in a period of global uncertainty that is calling into question the essence of the economic prosperity pursued in the last decades. It is recognised that what is urgently required is a policy shift from a primary push towards ever-increasing productivity and competitiveness goals to one that pursues a “renewed” concept of competitiveness—socially just and environmentally responsible—employing a reformed pan-economic approach. The continuing and progressive changes due to the systemic impact of shocks and stresses at the global level need a convergence of efforts by all countries. This is critical to balance the need to maintain economic prosperity generated by globalisation and to mitigate global crisis like climate change and the ongoing COVID-19 pandemic. The scenario that is emerging these days is similar to a post-war reconstruction economy, alongside climate change and the risks associated with it, the emergency of the pandemic has seriously questioned social stability at the urban level and the confluence of institutions in multi-level governance processes. Concurrently, the main question to be addressed can no longer be confined to how cities and regions can compete in a global context, but rather how they can survive in a world that must face the effects of continuous shocks by ensuring socially acceptable living conditions for everyone.

At European level, this need has been stimulating the debate for the revision of policies designed to build a better Europe for its citizens and a “restructuring process” of EU institutions in the light of anti-European, populist and sovereign political movements. These movements together with far-reaching global crises and shocks are threatening the future of EU and the Cohesion Policy grounded on the virtuous principle to reduce disparities by promoting social, economic and territorial cohesion. In response, the European Commission has recently introduced the European Green Deal, a set of policy initiatives to strive for a green transition based on solidarity and fairness. This marks a novel growth strategy that is comprehensive, ambitious and bold, integrating climate, environmental and social protection goals with economic ones. Such a transformative pathway helps set the stage for policy actions in the upcoming post-2020 programming period of the Cohesion

Policy. Arguably, these days the perspective of the EU mission will be redesigned, through new priorities and new tools launched for Shaping the Conference on the Future of Europe.

In this context, the debate on how to prepare EU territories and cities to address challenges of regional and global implications cannot be more relevant. The current development approaches need to be adjusted to formulate a new development pattern. Such a pattern is characterised by a more flexible approach in allocating investment, a more integrated approach to reach the goal of transition development and a more tailored, place-sensitive approach to regional development. It should facilitate a sustainable transition process towards transforming regional and urban socio-economic and technological systems. This process will be driven with an evolutionary approach in which knowledge and innovation dynamics can break path dependency and promote an effective regional diversification. This pattern should be underpinned by an integrated, multi-scalar and multidimensional approach aimed to enhance the resilience capacity of territories to respond to the various crises and shocks they are exposed to.

To substantiate these arguments, the Symposium was also part of the TREnD (Transition with Resilience for Evolutionary Economic Development) research project funded by the European Union's Horizon 2020 Research and Innovation Programme under the Marie Skłodowska Curie Actions – RISE 2018. Considering the above-mentioned unparalleled yet controversial complexity while responding to the European call for the green transition, TREnD proposes a new approach in the design process of place-sensitive, innovation-oriented development policies that can facilitate the regional and urban transition to sustainability while reinforcing resilience to shocks induced by transition economies (e.g. post-carbon economy). TREnD's approach is focused on how to strengthen the regional capabilities to trigger, implement and manage transition strategies towards driving "resilience-building" processes. The scope is to combine Transition with Resilience for Evolutionary Development in different territorial contexts towards a reforming process of Cohesion Policy for the next programming period 2021–2027. The TREnD, therefore, seeks to: 1) identify and examine the factors enabling or hindering the transition strategies at a governance standpoint; 2) assess the territorial characteristics critical to enable a resilience-building process; and 3) unveil the unexploited potentials for "reshaping trajectories" disclosed through the windows of local opportunities due to the external shocks cities and regions are continuously exposed to.

TREnD highlights regional diversification seen more as a process of co-creation of solutions and concepts to solve development problems through the enhancement of the resilience capacity of regions, which can be achieved by implementing tailored place-based innovation policies with a transitional approach. Stemming from the current debates on regional diversification together with the emerging role of the city in pursuing local innovation ecosystem, the aim is to explore new development policy configuration within the evolutionary framework to help different territories effectively respond to continuous shocks. It is expected to gain a sound understanding of the triggering mechanisms conducive to frame a more

inclusive S3 process for the post-2020 Cohesion Policy. This new framework, thanks to resilience-based process and transition management, will help define tailored S3 processes more sensitive to different regional contexts and needs. In so doing, it will reinforce innovation diffusion, facilitate diversification and tighten the linkages between advanced and peripheral areas (at regional and sub-regional levels) through more inclusive approaches.

Considering this vision, the Symposium tried to offer possible solutions to sustainable development as defined by the UN Agenda 2030, focusing on the complex and dynamic relationships between human society and technological development, and the latter's socio-economic, political, institutional and environmental impacts on territorial and urban systems. Indeed, investigating the nexus between the ever-changing societal needs and rapid technological development represents a valuable opportunity to achieve this ambitious goal. The desired shift towards a more sustainable knowledge-based economy and society since the beginning of the 2000s, especially in developed countries, is impeded by several challenges. In Europe, the Smart Specialisation Strategy (S3) represents the strong push to boost economic development through knowledge, research and innovation. The current academic and policymakers' debate is questioning its capacity to break down path dependencies and facilitate economic diversification. The difficulties in implementing and doubts about the effectiveness of this ambitious innovation-oriented policy—especially at regional level—suggest the need to revise the post-2020 Cohesion Policy and the approach beyond Regional Smart Specialisation Strategy (RIS3). Among the rising concerns, the controversial effect of innovation concentration on peripheral areas due to the new geography of knowledge is coming to the fore. The surging discontent shows how policymakers are struggling with continuous mutating scenarios characterised by more complex territorial dynamics. The pillar on which the current policy action seems to rest is represented by the potentials underlying knowledge complexity and innovation in reversing negative trends. However, recent studies have pointed out how such complexity is giving rise to inequalities in both core and lagging regions, making peripheral areas a common issue to tackle. More efforts are needed to address different aspects of inequalities connected with the new geography of knowledge. Therefore, a more inclusive and integrated approach is desirable to advance technological innovation while addressing social issues of health, environment, education and social exclusion.

Accordingly, the Symposium stimulated multidisciplinary discussions on the key elements of the debate on a shift in policy design and implementation, including transition management, resilience, diversification and quality of governance to leverage the potentials of peripheral areas and reshape the trajectory of economic growth for more equitable development. It aims to identify a new and balanced developed pattern, casting light on the multi-scalar and multidimensional analysis of different perspectives, strategies, tools, objectives and impacts of local economic development and innovation processes. Such a pattern needs to be framed within the United Nations 2030 Agenda (TS25) and to reach the Sustainable Development Goals (SDGs).

The sessions have been organised around key elements affecting vertically (multi-level) and horizontally (cross-sectoral and multidisciplinary) the social, economic, institutional, organisational and physical/environmental dimensions of local economic development. The themes of sessions followed the key elements of the debate on a shift in policy design and implementation to drive transition-oriented structural change of regions. This echoes the EU's desirable smart transition that requires an economically prosperous and socially inclusive transition process to promote regional convergence. Sessions TS04T1, TS04T2, TS04T3 and TS04T4 altogether build up the overall theoretical framework of a sustainable transitional development, offering insight into knowledge complexity, transition management, resilience, diversification and quality of governance to leverage the potentials of peripheral areas and reshape the trajectory of economic growth for more equitable development.

To achieve a smart transition, it is critical to reinforce the resilience of regions at different territorial scales, especially those expected to be more affected, to respond to the shocks that green and digital transitions are likely to trigger. In this regard, the Symposium undertook a multifaceted and multidimensional conceptualisation of resilience, for which sessions TS01, TS25 and TS26 investigated territorial system resilience, urban resilience and sustainability. Session TS07 looked into smart and resilient infrastructures, and sessions TS09 and TS23 investigated urban and built environment with sustainability and resilience. Sessions TS02, TS06, TS10 and TS21 pay close attention to territorial and urban regeneration. Urban and territorial regeneration is considered as a useful tool to facilitate territorial and urban resilience-building processes by promoting positive physical transformations and thereby increasing cities' preparedness and response capacity to crises and shocks. Sustainable urban and territorial regeneration needs to define new economic and territorial strategies within a period of financial constraints. Therefore, session TS21 casts light on the issue of circular regeneration, while session TS03 conducts a critical review of territorial dynamics and urban growth models.

The value-adding of local assets from the urban–rural perspective offers a chance to define alternative development patterns. In this respect, cultural heritage, as potential local assets, needs to be properly leveraged to drive sustainable local development. The Symposium, therefore, highlighted innovative approaches to heritage management. Session TS19 casted light on the enhancement of cultural heritage in fragile areas; session TS20 presents new management strategies for the value-adding of heritage in inner areas; session TS22 relates heritage management to climate change, exploring integrated conservation strategies based on traditional and innovative technologies able to help mitigate the negative effects of climate change. The Symposium equally gives insight into the urban transition towards a post-carbon society, a key element useful for the discussions on the new objectives of the post-2020 Cohesion Policy and new strategies and tools. Accordingly, session TS23 investigated an ecosystem services approach to the evaluation of settlement transformations; session TS12 was focused on green building related to post-carbon transition, and session TS30 furthers session TS12 and proposed eco-design-based strategies and approaches.

As in the past editions, this year's Symposium has received generous support from and will see the participation of a high-quality international network of higher academic institutions and scientific societies. Therefore, it will undoubtedly serve as an important occasion for exchanging and disseminating research findings and stimulating a fruitful debate on global challenges among academics and policy-makers. All in all, the Symposium and the contributions to its different sessions contributed to deepening the discussions on a transition-oriented approach—on which the TRENd project is grounded—while offering insights into how to fill the existing gaps.

Carmelina Bevilacqua

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An Evaluation Model for the Definition of Priority Lists in PPP Redevelopment Initiatives

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Abstract. With reference to the urban redevelopment interventions carried out through the Public Private Partnership procedure, the present research aims at testing a model able to quickly evaluate the convenience of the parties involved (private investors and Public Administrations). The model has been applied to three urban transformation initiatives to be developed in the city of Bari (Southern Italy), in order to verify the financial feasibility of each investment. The experimentation on the three projects considered could allow *i*) the Public Administration to define a priority list of the three urban initiatives to be launched in the city of Bari, *ii*) the private investors to weigh the risk of the different alternatives, in order to identify the most appropriate investment.

Keywords: Public-private partnerships · Discounted Cash Flow Analysis · Enhancement concession · Private operators · Public property assets

1 Introduction

In the current economic situation, the processes of existing real estate assets enhancement and of degraded urban areas redevelopment constitute an important opportunity to *i*) recover abandoned and/or damaged properties, *ii*) activate larger-scale regeneration initiatives, *iii*) trigger off local production systems, *iv*) promote the national economic growth [1, 2].

The use of alternative forms of financing and management of the interventions on the territory, based on the cooperation between the Public Administrations and private subjects through Public Private Partnership (PPP) procedures, is currently essential in the definition and the concrete implementation of the urban transformation [3, 4], as a means of filling the gap between the need for public services and the willingness of governments to pay for them [5, 6].

Currently, a PPP represents an investment model with a high development potential [7–10], whose benefits concern not only the combination of public capabilities with private financing effectiveness, but also a better quality of public assets management through the division of tasks and risks between the partners.

Each private and public subject involved in the recovery and the enhancement initiatives plays an important role both in the identification of the actions (*co-decision* phase) and in the allocation of resources (*co-financing* phase) [11].

In fact, two interests typologies are compared in the negotiation phase [12]. The first one (typically private) is represented by the maximization of the profits generated by the urban project implementation in terms of personal gain. The second one (typically public) is more complex as it is multidimensional and not associated exclusively to quantitative and monetary aspects. The participation of a private investor in a public property recovery and transformation process requires the satisfaction of the financial convenience criterion, i.e. the intervention ability to remunerate the capital initially invested and to generate an adequate profit for the entrepreneur [13, 14]. On the other hand, the public entity, by consolidating risk and responsibility in one private partner, is able to save time and money [15].

With reference of the different PPP procedures, all fundamentally focused on the sharing of the three core “R” components - resources, responsibilities, risk -, the *enhancement concession*, introduced by Art. 3-bis Legislative Decree n. 351/2001, is an effective tool able to bridge the financial deficit that characterizes the Italian state coffers.

In the context of the urban transformation initiatives carried out through the enhancement concession, the cooperation between Public Administrations and private subjects takes place by entrusting the use of the property to private economic investors for a time period preliminarily established for the maximum duration of fifty years (concession period). In the fixed time period, the private subject, usually as a company and/or a consortium, has the task to manage the property, recognizing to the public entity a share of the income deriving from the exercise of the activities carried out in the enhanced property.

In particular, the enhancement concession provides that the property ownership remains public for the entire duration of the concession and the public subject resumes the full availability of the property at the end of the concession period with each improvement, addition and modification made on it by the private subject.

The transformation initiatives of disused properties and/or abandoned urban areas carried out through the enhancement concession aim at the functional conversion of property assets no longer used for the original purposes or at the redevelopment of public spaces currently in degradation or abandonment state. Therefore, the enhancement concession allows the private investor not to place the costs related to the property purchase on the initiative’s business plan, and the Public Administration to improve an under-utilized or abandoned property through interventions paid by the private investor, by removing any costs related to the management phases of the asset.

2 Aim

The present research concerns the financial and economic assessment techniques - Benefit Cost Analysis (BCA) - to support decision-making processes in the context of the planning and management of urban interventions. The aim is to provide an innovative evaluation tool of rapid application in the selection phases among several

alternatives. The model could be applied with reference to the same intervention, in order to choose the best solution among the different alternatives presented or, with reference to different initiatives on different urban areas for the identification of the “best” one where to concentrate available resources. In this sense, the proposed model could allow Public Administrations to define a priority list of urban initiatives to be launched and implemented in order to satisfy the needs of the local communities. Furthermore, the model could allow private investors to weigh the different alternative interventions risk.

In general terms, the operating methods used for the financial analysis are based on the assessment of the cash flows for all the analysis period, considering an appropriate discount rate (r). In particular, this coefficient is equal to the expected return on investment of the private investor (r_{min}), that reflects the *opportunity cost* of the private resources, i.e. the return to which the subject gives up by “participating” in the specific initiative.

The implementation of the *Discounted Cash Flow Analysis* (DCFA) in the context of the PPP initiatives allows, therefore, to verify the financial convenience for the subjects involved through *i*) the assessment of the initiative transformation costs, management costs and of the revenues; *ii*) the interpretation of the main performance indicators (*Net Present Value* - NPV -, *Internal Rate of return* - IRR -, *Discounted Payback Period* - PbP). In particular, as the discount rate r increases, NPV decreases and PbP increases, in accordance with the increase in risk associated with the specific investment.

With reference to the PPP initiatives, the present research borrows a model proposed by Tajani et al. [16] for assessing the financial conveniences of the parties involved (private investor and Public Administration). Starting from the definition of the NPV and the PbP , assuming that the investment costs are concentrated at year “0” in which the analysis is carried out and the investment cash flows that occur after the PbP are periodically constant, the Eq. (1) is valid.

$$F_t \cdot \frac{(1+r)^{(T-PbP)} - 1}{r \cdot (1+r)^T} = NPV \tag{1}$$

where F_t represents the cash flow of the investment in the period t , r is the discounted rate, T is the analysis period, PbP is the Discounted Payback Period and NPV is the Net Present Value of the investment.

In particular, established the time period by which the private entrepreneur intends to recover the invested capital (PbP), the model allows to return the different combinations of r_{min} and NPV of the different cases analyzed (different project proposals presented relating to the same urban intervention or different urban projects). Furthermore, the NPV represents the maximum amount that the Public Administration may require to the private investor in monetary terms and/or in terms of public works of equivalent value to be realized for the local community. A higher value of the NPV represents a higher convenience for the private subject in financial terms and for the Public Administration in terms of the maximum admissible request that can be formulated to the investor.

The paper is structured as follows. In Sect. 3 the case study has been described and the economic parameters necessary for the construction of a DCFA have been summarized. In Sect. 4 the application of the proposed model to the case study has been developed and the results obtained have been outlined. Finally, in Sect. 5 the conclusion of the work have been discussed.

3 Case Study

The case study considered in the present research concerns three urban transformation interventions to be carried out in the city of Bari (Southern Italy), included in the plans for public works to be implemented but not yet started. In particular, the first initiative concerns the redevelopment of the Vittoria Stadium area (intervention A), the second initiative concerns the construction of an aquarium within the already activated urban regeneration process of the San Girolamo waterfront (intervention B) and the third initiative regards the realization of the San Cataldo tourist port (intervention C). The three projects, that are different in typology and consistency, are located in three different municipal areas, as shown in Fig. 1.

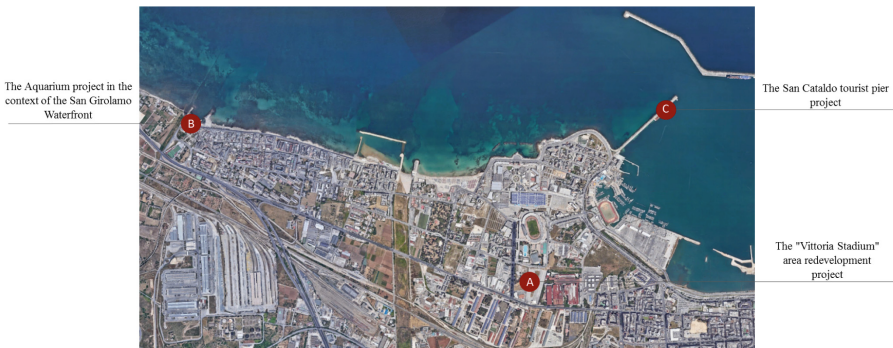


Fig. 1. Location of the three redevelopment interventions in the city of Bari

The hypothesis of the analysis concerns the three projects implementation through the procedure of the enhancement concession, by implying the involvement of private subjects for the recovery and the functional conversion of each project area.

For each initiative, the main features that characterize the urban area in which it is located have been described and, subsequently, the objectives that are intended to be achieved have been illustrated and the planned works summary description has been shown. In addition, the main results obtained from the implementation of the financial analysis carried out using the DCFA in terms of assessed investment and management costs and expected revenues have been explained. The analysis period considered for all three cases is thirty years that coincides with the duration of the established concession. It is also assumed that the *PbP* is the same for all three cases and equal to twelve years.

3.1 The “Vittoria Stadium” Area Redevelopment Project

The project aims at transforming the “Vittoria Stadium” area, located in the San Girolamo district of Bari. Currently, in the area there are not residential and retail properties and the space is intended for parking for the Fiera del Levante property complex. The intervention provides for the construction of a sports-student center, in accordance with the current characteristics of the area and the existing buildings (University Sport Centre Bari and one of the largest municipal swimming pools in Central and Southern Italy). In particular, the initiative intends to realize a building complex that includes a more levels multipurpose guesthouse with recreational and sports facilities, a building for sports and commercial equipment storage and a car parking. The project will be completed with the redevelopment of the disused farmers’ market existing pavilions and their recovery into art studios. The total investment cost assessed is €71,419,950. Taking into account the high costs, the project implementation provides a public contribution, due to the significant effects that the redevelopment initiative could generate on the entire Vittoria Stadium urban area.

The potential revenue sources deriving from the complex activities have been evaluated (revenues from housing sales, rental revenues from commercial areas and areas intended for sports activities, revenues from the car parking). In the same way, the macro items of the management costs related to the guesthouse (operating costs, general and administrative expenses, advertising and marketing, maintenance), the car parking (staff costs, maintenance) and the art studios (maintenance).

Table 1 shows the total investment cost, the annual management costs, the total revenues and the cash flows assessed in the operating phase of the property complex. In Fig. 2, the area “Vittoria Stadium” current state and the guesthouse realization project are shown.

Table 1. The “Vittoria Stadium” area redevelopment project economic items

Total investment cost [€]	Annual management cost [€]	Annual revenues [€]	Cash flow (constant from PbP) [€]	Concession period
71.419.950	7.450.000	9.950.000	2.500.000	30

3.2 The Aquarium Project in the Context of the San Girolamo Waterfront

The Aquarium project is part of the wider waterfront redevelopment project in San Girolamo-Fesca district in Bari. It aims at overcoming the current marginal conditions of the urban area lacking of interest spaces for the city due to the almost total absence of services, commercial activities, or leisure equipment. With reference to the neighborhood and the area overlooking the coast, there is a significant demand for services not satisfied, above all for the lack of public spaces such as “socializing places”. The commercial intended uses located on the ground floors of the buildings along the

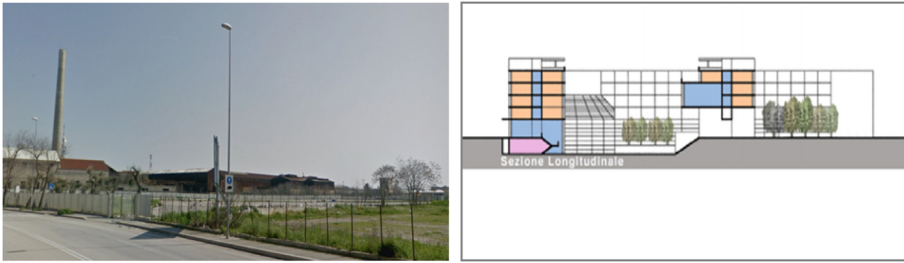


Fig. 2. The “Vittoria Stadium” area current state and the guesthouse realization project

coastline are often in disuse, as the promenade is exclusively considered as a fast crossing on the urban area edge rather than as a service axis of the neighborhood.

The aquarium with a mainly “edutainment” (i.e. educational entertainment) function provides for the introduction of commercial activities and restaurant and a minimum surface area necessary to carry out the research activities. The identification of the intended use (aquarium) has been carried out by analyzing the current and forecasting demand and supply of the reference market. In particular, it has been noted that the main demand segments are represented by school groups, tourists and the surrounding areas population. With reference to the current supply on the national territory, the largest aquarium is in the city of Genoa, to which other smaller aquarium structures have been added (in Southern Italy the aquarium of Naples, Cattolica and Nuoro), confirming a total absence of a size similar to project aquariums in Apulia region, and consequently in the city of Bari. The project provides for the construction of an aquarium (sea museum) with commercial spaces (gift shop, bookshop), a restaurant, a bookshop, a meeting room and a car parking.

The investment costs have been quantified (€21,646,200) and the annual management costs and the potential sources of revenue have been assessed (revenues from ticket sales, rental revenues from commercial areas, car parking revenues). Table 2 shows schematically the items of costs and revenues and the cash flows necessary for the implementation of the proposed model. In Fig. 3 the Waterfront San Girolamo current state is shown and the Aquarium realization project in the wider regeneration of the waterfront is presented.

Table 2. Aquarium project in the context of the San Girolamo Waterfront economic items

Total investment cost [€]	Annual management cost [€]	Annual revenues [€]	Cash flow (constant from PbP) [€]	Concession period
21.646.200	750.800	1.750.800	1.000.000	30



Fig. 3. San Girolamo Waterfront current state and Aquarium realization project

3.3 The San Cataldo Tourist Port Project

The San Cataldo port (650 m in length) was built in the 1920s. The port is characterized by the presence of a dock of about 7.20 m in width. It represents the northwest border of the port of Bari, located near the homonymous urban peninsula occupied by a small residential neighborhood of historical single-family building of the early twentieth century and more modern multi-level buildings. The port location is decentralized with respect to the large port areas where most of the traffic takes place. Furthermore, the dock limited width does not allow any goods traffic. The redevelopment of the San Cataldo port aims at recovering the potential of the Bari port from a yachting point of view in order to assign a new function to the sea area as a tourist port and landing place for small and medium size cruise ships.

The project solution concerns the construction of a new tourist port with approximately 400 berths for stationary boats and 40 berths for boats in transit, a dock for mooring small and medium size cruise ships (maximum length 175 m and maximum draft 6 m), three buildings for nautical club, customs offices, administrative offices and a multifunctional exhibition and commercial space. The project will be completed by external exhibition spaces and equipped green areas, car parking for boaters and terminal and a boat refueling facility. The intervention main objective is to activate economic and social revitalization processes for the entire urban area through the creation of new public spaces for the community, areas for walking, parking and restaurant. The intended use (tourist port) is associated to the vocational perspectives of the area, considering that the berths supply is lower than the threshold for the current permanent demand in the catchment area.

In order to verify the financial sustainability of the intervention - from the private investor point of view -, an assessment of the investment costs has been carried out (€28,096,177) and the revenues and management costs items have been identified. Finally, the project cash flows have been determined (Table 3). The revenues will derive from the berths rental, the mooring services management, the rental of commercial areas, the sub-concession of a stationary distributor on the quay for the bunkering and the car parking activity. Management costs will concern the goods purchase, the labor and the fixed management costs (maintenance costs, general expenses, costs for advertising, marketing activities, insurance and state concession fees). Figure 4 shows the San Cataldo port current state and the enhancement project.

Table 3. The San Cataldo tourist port project economic items

Total investment cost [€]	Annual management cost [€]	Annual revenues [€]	Cash flow (constant from PbP) [€]	Concession period
28.096.177	2.350.000	3.650.000	1.300.000	30

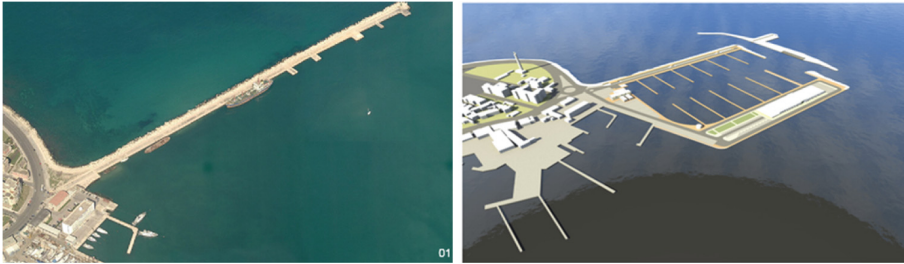


Fig. 4. The San Cataldo port current state and enhancement project

4 Application of the Model

With reference to each of the three interventions selected for the city of Bari, the *PbP* is set equal to twelve years, which is reasonably the time necessary for the private investor who operates in ordinary conditions to recover the capital initially invested. The implementation of Eq. (1) returns the combinations $[r_{min}-NPV]$ reported in Table 4. The graph in Fig. 5 shows the inverse functional relationship between the two variables for each case study. It is interesting to note that, although intervention A is the best in terms of *NPV* obtained at each *r* in the range identified (from 5% to 12.5%), it is necessary to consider the different risk associated with each intervention in order to select the most performing one for the investor. In this sense, the project riskiness is linked to the location, to the intervention costs (investment and management costs), to the number, typology and surfaces of various intended uses.

In particular, the intervention A (The “Vittoria Stadium” area redevelopment project) is characterized by a high assessed investment cost (considerably higher than the other two interventions considered) and by the different intended uses mixture (multipurpose guesthouse, recreational, sporting and commercial structures and a multi-level car parking), which is also particularly risky in the context of the city of Bari. In fact, the realization of a sports-student center, although it is consistent with the current sporting vocation of the area and with the existing structures (the CUS Bari and the municipal swimming pools), constitutes a radical transformation of the stadium area, particularly relevant from the point of view of initial costs and therefore risky. The minimum return expected by the investor of intervention A has been assessed equal to 11.5%.

The intervention B (the Aquarium project in the context of the San Girolamo Waterfront) intends to introduce an architectural and functional emergency on urban

Table 4 NPV related to the interventions A, B and C for different value of r_{min}

r_{min}	A	B	C
5%	16.272.998,48	6.509.199,39	8.461.959,21
5,50%	14.788.068,31	5.915.227,32	7.689.795,52
6%	13.452.468,03	5.380.987,21	6.995.283,37
6,50%	12.249.876,47	4.899.950,59	6.369.935,77
7%	11.165.887,22	4.466.354,89	5.806.261,35
7,50%	10.187.769,98	4.075.107,99	5.297.640,39
8%	9.304.263,32	3.721.705,33	4.838.216,92
8,50%	8.505.394,37	3.402.157,75	4.422.805,07
9%	7.782.321,92	3.112.928,77	4.046.807,40
9,50%	7.127.199,60	2.850.879,84	3.706.143,79
10%	6.533.056,61	2.613.222,64	3.397.189,44
10,50%	5.993.693,50	2.397.477,40	3.116.720,62
11%	5.503.591,06	2.201.436,42	2.861.867,35
11,50%	5.057.830,66	2.023.132,26	2.630.071,94
12%	4.652.024,36	1.860.809,74	2.419.052,66
12,50%	4.282.253,72	1.712.901,49	2.226.771,93

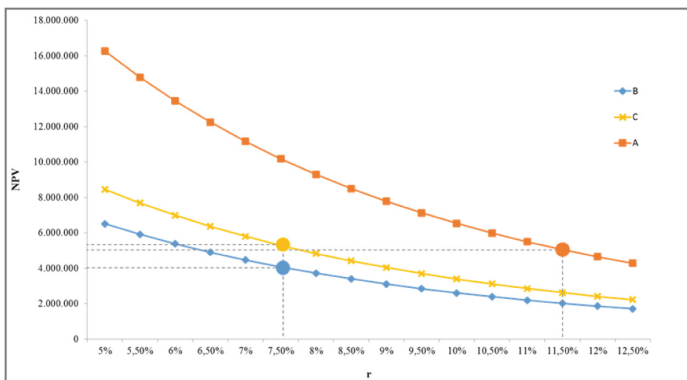


Fig. 5. [r_{min} - NPV] combinations for the $PbP = 12$ years

and territorial scale able to promote links between the neighborhood and the city and to receive a catchment area very large (school groups, tourists, cruise passengers, etc.). The aquarium concerns the wider waterfront redevelopment as an attraction center, museum, study/research and free time space, in order to encourage the renewal process of the San Girolamo district currently devoid of urban identity and strong state of decay. The project is less risky than the intervention A, due to the lower investment costs and the almost unique intended use able to generate important effects in economic and social terms. The minimum return expected by the investor of intervention B is assessed at 7.5%.

The intervention C (The San Cataldo tourist port project) aims at raising the current supply in terms of infrastructural facilities for tourist ports and the quality of port services in the Apulian region, which is extremely lacking compared to other competitive Italian and Adriatic regions. Compared to the intervention B, the investment cost is almost similar, and the two initiatives present the same level of risk, linked to the variable demand of tourist ports in Apulia and, in particular, in the Bari area, and to the cruise sector growth trend, which cannot be controlled. The minimum return expected by the investor of intervention C has been assessed equal to 7.5%.

Although the graph in Fig. 5 shows that the intervention A is more profitable for the private subject - the *NPV* graph for intervention A is over the *NPV* graphs for the intervention B and C - the higher risk associated with this intervention A must be considered. Therefore, with reference to the different rates of return ($r_{minA} = 11.5\%$, $r_{minB} = 7.50\%$, $r_{minC} = 7.50\%$), among the three urban transformation initiatives, the project C - the San Cataldo tourist port project - is the “best” one, followed by the intervention A for the “Vittoria Stadium” area redevelopment project and, finally, by the intervention B for the Aquarium project in the context of the San Girolamo Waterfront.

5 Conclusions

With reference to the urban redevelopment interventions carried out through PPP procedures, in the present research a “quick” methodology for the evaluation of the financial conveniences of the parties involved (public and private subjects) has been applied, in order to select the most performing alternative for both the subjects among the different project solutions. In particular, the model aims at providing an original interpretation of the classic performance indicators currently used to verify the financial project sustainability. The model could be used in the first phases of assessment public investments, in order to provide a first indication of the interventions feasibility, that should be completed through the implementation of a more accurate DCFA. The case study considered, concerning three urban transformation initiatives to be carried out in the city of Bari (Italy), has highlighted the potentialities of a simple-to-use model and easy to be repeated, in order to guide subsequent analyzes in the decision-making processes. The model, therefore, constitutes a useful support for the Public Administrations to define a priority list of the interventions to be implemented on the urban territory.

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