Advances in Science, Technology & Innovation
IEREK Interdisciplinary Series for Sustainable Development

Muhammad Nawaz Tunio · Helder I. Chaminé ·
Pir Mohammad · Davide Longato · Lucia Della Spina *Editors*

Landscapes Across the Mediterranean—Volume 2

Interdisciplinary Approaches in Cultural Landscape Management in the Built Environment

IEREK RESEARCH & KNOWLEDGE ENRICHMENT

Springer

Advances in Science, Technology & Innovation

IEREK Interdisciplinary Series for Sustainable Development

Advances in Science, Technology & Innovation (ASTI) is a series of peer-reviewed books based on important emerging research that redefines the current disciplinary boundaries in science, technology, and innovation (ASTI) in order to develop integrated concepts for sustainable development. It not only discusses the progress made towards securing more resources, allocating smarter solutions, and rebalancing the relationship between nature and people, but also provides in-depth insights from comprehensive research that addresses the 17 sustainable development goals (SDGs) as set out by the UN for 2030.

The series promotes the creation and development of viable solutions for a sustainable future and a positive societal transformation with the help of integrated and innovative science-based approaches. Including interdisciplinary contributions, it presents innovative approaches and highlights how they can best support both economic and sustainable development, through better use of data, more effective institutions, and global, local, and individual action, for the welfare of all societies.

The series particularly features conceptual and empirical contributions from various interrelated fields of science, technology, and innovation, with an emphasis on digital transformation, that focus on providing practical solutions to ensure food, water, and energy security to achieve the SDGs. It also presents new case studies offering concrete examples of how to resolve sustainable urbanization and environmental issues in different regions of the world. The series is intended for professionals in research and teaching, consultancies and industry, and government and international organizations. Published in collaboration with IEREK.

The series draws on the best research papers from various IEREK's international conferences, while external conference proceedings proposals are no longer accepted as direct publications. The series does invite significant expansions of selected papers previously submitted to conferences. The Editors' role should be evident in the reviews through an intensive **double-blind peer review** process, helping authors with edits, and collaborating with them to demonstrate **great academic significance** through clear research findings and innovative solutions that go well beyond a typical conference submission.

The ASTI series welcomes external proposals and requests to publish **edited books, contributed volumes, monographs,** and **textbooks**. With the commitment to the aforementioned instructions and policy.

The ASTI series has now been accepted for Scopus (September 2020). All content published in this series will start appearing on the Scopus site in early 2021.

ASTI's editorial office helps authors and editors in producing work of the highest possible quality. For any assistance for those interested in submitting proposals please contact the editorial office at asti.serties@ierek.com

Muhammad Nawaz Tunio · Helder I. Chaminé · Pir Mohammad · Davide Longato · Lucia Della Spina
Editors

Landscapes Across the Mediterranean—Volume 2

Interdisciplinary Approaches in Cultural Landscape Management in the Built Environment

Springer

Editors
Muhammad Nawaz Tunio
University of Sufism and Modern Sciences
Bhitshah, Pakistan

Pir Mohammad
Department of Land Surveying
and Geo-Informatics
The Hong Kong Polytechnic University
Hong Kong, Hong Kong

Lucia Della Spina
Real Estate Appraisal and Projects Evaluation,
Department of Architecture and Design (dAeD)
Mediterranea University of Reggio Calabria
Reggio Calabria, Italy

Helder I. Chaminé
Department of Geotechnical Engineering
Laboratory of Cartography and Applied Geology
(LABCARGA), School of Engineering (ISEP),
Polytechnic of Porto
Porto, Portugal

Davide Longato
Department of Architecture and Arts
University IUAV of Venice
Venice, Italy

ISSN 2522-8714 ISSN 2522-8722 (electronic)
Advances in Science, Technology & Innovation
IEREK Interdisciplinary Series for Sustainable Development
ISBN 978-3-032-09144-4 ISBN 978-3-032-09145-1 (eBook)
https://doi.org/10.1007/978-3-032-09145-1

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

The Mediterranean has long been celebrated as the cradle of civilizations, a crossroads of cultures, and a mosaic of landscapes shaped by millennia of human interaction with nature. Yet today, this region finds itself at the forefront of some of the most pressing global challenges: climate change, environmental degradation, uncontrolled urban sprawl, resource scarcity, and the progressive loss of cultural identities. These challenges are deeply interconnected and require integrated and systemic interventions that transcend disciplinary boundaries.

The international conference Landscapes Across the Mediterranean (CrossMED), to be held from December 11 to 13, 2024, at the Mediterranea University in Reggio Calabria, was conceived as a multidisciplinary platform where researchers, professionals, and institutions from diverse fields can dialogue, share knowledge, and envision new integrated and interdisciplinary approaches for the sustainable management and transformation of Mediterranean landscapes.

Landscapes, whether natural, urban, rural, or hybrid, are constantly evolving living systems, embodying not only ecological and spatial dimensions but also cultural, social, and symbolic values and as such require careful management. The conference emphasized the importance of promoting multidisciplinary approaches capable of addressing the Mediterranean context at multiple scales and levels of complexity: from infrastructure design to cultural heritage conservation, from climate to adaptive reuse to sustainable resource management.

The contributions collected in this volume reflect the intellectual richness and diversity of perspectives that characterized the conference discussions. A wide range of topics were explored, demonstrating how innovation and tradition can coexist in the pursuit of more resilient and inclusive futures.

We extend our deepest gratitude to all those who contributed to the success of CrossMED 2024: the authors, keynote speakers, the scientific committee, participants, the organizing team, the Department of Architecture and Design of the Mediterranea University of Reggio Calabria, and all the institutional partners. Their enthusiasm, commitment, and vision were instrumental in shaping the conference.

We hope that the reflections and case studies presented here will serve not only as a reference for ongoing academic research but also as a catalyst for action, inspiring new collaborations and policy interventions aimed at safeguarding the Mediterranean's unique landscapes for generations to come.

Reggio Calabria, Italy — Lucia Della Spina

Acknowledgments

We would like to express our deepest appreciation to all the authors and reviewers whose dedication, intellectual rigor, and scholarly commitment have been instrumental in shaping these proceedings of the Landscapes Across the Mediterranean (CrossMED) international conference. Their valuable contributions have broadened and deepened the interdisciplinary dialogue on Mediterranean landscapes, offering fresh insights into the pressing challenges of sustainability, management, and cultural preservation.

We extend special thanks to IEREK for the organization of this event and to the Mediterranea University of Reggio Calabria (Italy) or generously hosting this academic exchange, creating an environment where knowledge, ideas, and innovative research could be shared and debated. In particular, we wish to acknowledge the fundamental support of the **Department of Architecture and Design (dAeD)**, along with all the departments of the Mediterranea University whose collaboration has been essential in enriching and strengthening the scientific foundations of this event.

We are equally grateful to our partner institutions and all scientific societies, whose collaboration and support have been fundamental to the realization of this collective work. The richness of this volume reflects a shared vision: to safeguard, interpret, and reimagine the Mediterranean's landscape heritage through critical reflection, scientific inquiry, and a commitment to sustainable futures.

Lucia Della Spina

Introduction

The Mediterranean region, historically a crossroads of civilizations and a vital ecological and cultural nexus, is currently at the center of international scientific discourse on environmental sustainability, heritage conservation, climate adaptation, and urban transformation. In a context increasingly marked by the intensification of climate change, rapid urbanization, tourism pressure, and the overexploitation of natural resources, the Mediterranean emerges as a privileged laboratory for exploring and testing integrated strategies for territorial and landscape management.

The theme of the international conference *"Landscapes Across the Mediterranean. Multidisciplinary Considerations in Landscape, Infrastructure, Architecture, and Resource Management" (CrossMED)* fully reflects the complexity of these interrelated challenges and underscores the need for systemic and interdisciplinary approaches to address them effectively and sustainably.

In contemporary academic discourse, landscapes—whether natural, agricultural, or urban—are no longer understood as static entities, but rather as dynamic systems shaped by the continuous interaction between environmental processes and human activity. Within this framework, the Mediterranean stands out as an exemplary case study, due to its exceptional cultural heritage, ecosystem diversity, and heightened vulnerability to the impacts of climate change. The urgent need to address phenomena such as environmental degradation, biodiversity loss, uncontrolled urban expansion, and anthropogenic pressure compels a critical rethinking of prevailing development and management models.

The protection and enhancement of Mediterranean landscapes are increasingly recognized as a global strategic priority. Often described as a "living museum," the region safeguards a tangible and intangible heritage of extraordinary value, now threatened by the combined effects of urban development and climate change. International legal instruments, such as the *European Landscape Convention* and the *UNESCO World Heritage Convention*, advocate for a holistic vision of conservation—one that integrates environmental, social, cultural, and economic dimensions. Today's key challenges concern the implementation of sustainable land use practices, the adaptive reuse of the built heritage, and the application of digital technologies in the documentation, management, and valorization of cultural landscapes.

An additional area of critical concern is the integration of infrastructure into sensitive landscape contexts. The expansion of Mediterranean cities necessitates a redefinition of infrastructure design criteria to ensure that they meet contemporary needs without compromising environmental integrity and local identity. Recent scientific literature highlights the strategic role of green infrastructure, renewable energy systems, and smart technologies in reducing ecological impact and fostering the transition toward more resilient and inclusive urban models.

Sustainable management of natural resources—particularly water, energy, and agroforestry—is also of strategic importance. The Mediterranean is among the regions most affected by water scarcity, desertification, and the instability of agri-food systems. In alignment with the United Nations Sustainable Development Goals (SDGs), the international scientific and policy communities promote integrated resource management models based on technological innovation, environmental monitoring, remote sensing, and the active participation of local communities.

In parallel, urban resilience and climate-adaptive architecture have become central themes in the design of the built environment, especially in Mediterranean coastal cities increasingly exposed to sea-level rise, heatwaves, and extreme weather events. The most recent literature proposes design strategies that combine energy efficiency, the use of local materials, and bioclimatic approaches, forming the theoretical and operational framework of "climate-adaptive architecture." In this context, the adoption of advanced digital tools and multiscalar planning methodologies is essential to promote safer, healthier, and more sustainable built environments.

The growing complexity of the challenges facing the Mediterranean demands a profound transformation in research and planning paradigms, oriented toward interdisciplinary collaboration among institutions, scholars, professionals, and communities. The **CrossMED 2024** conference embodies this vision, serving as a platform for interdisciplinary scientific exchange on the most pressing issues concerning the future of Mediterranean landscapes. From landscape ecology to engineering, from architecture to resource governance, CrossMED fosters a space for dialogue and innovation aimed at strengthening international cooperation.

In this context, this volume represents a first selected collection of contributions and case studies presented during the international conference *Landscapes Across the Mediterranean (CrossMED)*, jointly organized by **IEREK** and the **Mediterranea University of Reggio Calabria**, and held in Reggio Calabria from December 11 to 13, 2024. The papers offer a rich and articulated overview of the main themes addressed during the conference and are organized into ten thematic topics, ranging from landscape conservation to sustainable infrastructure, from resilient architecture to risk management, and from technological innovation to the enhancement of cultural and rural landscapes.

Collectively, the contributions provide an updated and critical perspective on the challenges and opportunities facing the Mediterranean region. The scientifically grounded and operationally feasible proposals presented here highlight the relevance of interdisciplinary and multiscalar approaches that combine environmental sustainability, social inclusion, technological innovation, and cultural heritage conservation. They provide a solid foundation on which to build policies, practices, and research paths aimed at a more equitable, resilient, and sustainable Mediterranean future.

Lucia Della Spina
Reggio Calabria, Italy

A Word from the Editors

This edited volume stems from the growing awareness that the Mediterranean, as a fragile socio-ecological system, faces unprecedented challenges linked to climate change, environmental degradation, socio-economic inequalities, and the loss of cultural landscapes. In this context, the Mediterranean Strategy for Sustainable Development (MSSD) 2016–2025 offers a crucial policy framework to translate the global ambitions of the 2030 Agenda and the Sustainable Development Goals (SDGs) into actions tailored to the specific conditions of Mediterranean territories.

The diverse contributions collected here reflect an increasing commitment to rethink development models through integrated, place-based approaches that balance environmental sustainability, social equity, and economic resilience. Drawing on contemporary research in landscape studies, territorial governance, and sustainability science, this volume explores how innovative methodologies—such as nature-based solutions, adaptive reuse, heritage-led regeneration, and community-driven planning—can shape the Mediterranean's future.

The six thematic topics emphasize the need to align international sustainability commitments with local realities, fostering multi-level cooperation, participatory governance, and inclusive decision-making. Central to all contributions is the belief that investing in environmental sustainability is not only compatible with economic growth but essential to long-term prosperity and social well-being.

We hope this volume will serve as both a foundation for further research and a catalyst for transformative actions toward a more resilient, inclusive, and sustainable Mediterranean region.

Lucia Della Spina

Scientific Committee

Ghazala Shoukat, University of Sindh
Erum Shiakh, Shaheed Benazir Bhutto University, Sanghar Campus
Tiago Abreu, School of Engineering (ISEP), Polytechnic of Porto, Portugal
Samreen Tunio, Bahria University
Ana C. Meira Castro, School of Engineering (ISEP), Polytechnic of Porto, Portugal
João Paulo Meixedo, School of Engineering (ISEP), Polytechnic of Porto, Portugal
José Teixeira, University of Porto (FLUP) and CEGOT|UP, Portugal
Aamir Rashid, York College/CUNY, USA
Muhammad Asif Qureshi, Bahria University, Karachi
Stefania De Medici, Università degli Studi di Catania
António Alberto Teixeira Gomes, University of Porto (FLUP) and CEGOT|UP, Portugal
Aqil Tariq, Mississippi State University
Rodrigo Falcão Moreira, CONSTRUCT|LESE, School of Engineering (ISEP), Polytechnic of Porto, Portugal
Munwar Ali Pahi, Iqra University, Karachi
Jawaid Qureshi, SZABIST, Karachi
Filippo Magni, IUAV University of Venice
Naveeda Katper, University of Sindh
Chiara Cortinovis, University of Trento
Bonin Mahdavi Estalkhsari, Research Assistant at Shahid Beheshti University
Gomal Amin, The Hong Kong Polytechnic University
Federico Camerin, Universidad de Valladolid
Shakeel Ahmed, Greenwich University, Karachi, Pakistan
Luís Lopes, University of Évora and Earth Sciences Institute (ICT), Portugal
Atiye Tugrul, Istanbul University-Cerrahpaşa, Turkey

Contents

Housing Inequality and Luxury Accommodation. Evidence from an Italian Case Study for Effective Public Compensation Mechanisms

Francesco Tajani, Pierfrancesco De Paola, and Giuseppe Cerullo

Abstract

The current historical period is characterized by the persistence of latent and explicit crisis situations. Several simultaneous factors (pandemic crisis, economic instability, inflationary growth, increasing energy costs) are contributing to a current contingency of pronounced uncertainty and difficulty. Furthermore, the issue of housing deprivation must be pointed out in the outlined framework. Despite a consistent improvement in the average quality of housing over the past two decades, unfit, non-functional and cramped housing units remain a reality for millions of people. In Italy, the housing emergency is an increasing phenomenon, exacerbated by a high proportion of the population at risk of poverty and social exclusion. Consequently, a significant segment of the population, devoid of alternatives, is forced to live in decrepit and unsuitable housing. However, in the last decades, there has been a substantial increase in socio-economic disparities: for the first time in twenty-five years, both extreme wealth and extreme poverty have recorded a drastic and simultaneous increase. While the majority of people has been suffering the negative consequences of the crisis, a subset of individuals has been affected by a solidification of their economic conditions. Indeed, the luxury market has exhibited remarkable resilience, particularly in the hospitality sector. In this context, the current study aims to analyse the potentialities of the compensation mechanisms, with a particular focus on the application of the Extraordinary Urbanization Contribution, as provided by the Italian legislation, to the redevelopment initiatives in the luxury hospitality sector, highlighting the "greater value" that can be generated. This plus-value, generated through private initiatives and resources, could trigger a virtuous cycle that, through the role of Public Administrations, enables the identification of structured alternatives within a more comprehensive framework of urban policies, by contributing to the realization of collective works through effective compensation mechanisms.

Keywords

Housing inequality · Public compensation · Financial convenience · Extraordinary Urbanization Contribution · Discounted Cash Flow Analysis

1 Introduction

The global pandemic and the subsequent economic recession have undoubtedly exacerbated the already challenging living conditions of low-income families, particularly with reference to the housing. From a historical perspective, it can be asserted that the house has consistently served as a demarcating factor between individuals with higher financial resources and those with fewer ones. The disparities between these two groups are evident in the condition, structure, and location of their respective residences (Adorni and Tabor 2019). Housing inequality is a distinctive phenomenon that can be affected by income inequality and, simultaneously, contribute to it. Increases in income inequality over the years have been associated with a growing disparity in the affordability of housing (Dewilde and De Decker 2016). Despite the fragmentation of available sources, the distribution of wealth in Italy has been characterized by extreme inequality (Credit Suisse 2022).

F. Tajani · G. Cerullo (✉)
Department of Architecture and Design, "Sapienza" University of Rome, Rome, Italy
e-mail: giuseppe.cerullo@uniroma1.it

F. Tajani
e-mail: francesco.tajani@uniroma1.it

P. De Paola
Department of Industrial Engineering, Federico II University of Naples, Naples, Italy
e-mail: pierfrancesco.depaola@unina.it

M. Nawaz Tunio et al. (eds.), *Landscapes Across the Mediterranean—Volume 2*,
Advances in Science, Technology & Innovation, https://doi.org/10.1007/978-3-032-09145-1_34

The organization of the urban structure itself is an expression of the class conflict between the capitalist economic system and the weaker social classes, driven by public policies that often favour private development rather than the collective interests (Camagni 2011). In addition, cities are the result of long processes of valorisation and stratification of different forms of urban rents in the territory. In this context, there are "alternative" measures (such as the Extraordinary Urbanization Contribution) aimed at finding resources and a private nature know-how to be used for the construction of infrastructures and public works (Battisti and Campo 2018). Although cyclical trends in the real estate market affect the profitability of urban transformation processes and the production of rents, capital gains and entrepreneurial profits, a redistribution of plus-value between the public and private sectors still represents an open challenge. The procedures that somehow seek to capture the surplus value and acquire the contribution of developers to infrastructure and community services are of three types: the implementation of urban planning standards, the payment of urbanization and construction charges and the payment of an Extraordinary Urbanization Contribution (EUC) (Morano et al. 2021). This article focuses on the EUC: the letter d-ter, co. 4 of Art. 16 of Presidential Decree no. 380/2001, introduced by Law no. 164 of 2014 and amended by Law no. 76 of 2020, configures the EUC in Italy as a consensual and negotiated concessionary charge—in addition to primary and secondary urbanization charges—related to the higher property value due to urban planning variations. The private resources of the income produced are bound "to a specific cost centre for public works or services to be carried out in the context of the intervention, transfer of areas or buildings intended for public utility services, social housing or public works" (urban redevelopment, environmental protection and social reform) (Cardoso 2011).

Therefore, Italian legislation establishes that the private subject must pay to the Public Administration an extraordinary contribution not less than 50% of the plus-value generated by the "interventions on areas or buildings in urban planning variation". In synthesis, the objective of taxation would not concern the land or property values stock, but rather the emerging rent (capital gain), i.e. its variation generated by the processes of buildings redevelopment or transformation of land uses and capitalized in the land value itself (Modigliani et al. 2016). Moreover, this mechanism appears as a fundamental opportunity for territorial development and regeneration, as it represents one of the main means to finance infrastructure and public works, especially at a local level, which would otherwise lack the necessary financial coverage.

2 Aim

This research aims at outlining, through an analysis of an Italian case study, the situations in which a private investor can contribute to the financing of public works and collective urban facilities through the implementation of a virtuous mechanism of value recapture. In particular, the work intends to examine the current socio-economic context, characterized by a marked inequality between those individuals who increase their wealth and those who witness the deterioration of their assets. In this scenario, the work proposes an in-depth analysis of a case study located in Rome (Italy), providing a useful reference for the Public Administration. Through the application of the EUC, public authorities can collect resources from private urban initiatives involving either existing buildings or new constructions, that generate a plus-value. This plus-value can then be redistributed to the community through the provision of public utility services, social housing, or public infrastructure, thereby establishing an effective mechanism for the social compensation.

The research is structured as follows. In Sect. 3, a general framework that explores the income disparity issue and the current attention of the international investors in the luxury accommodation is presented. In Sect. 4, the case study is illustrated relating to the conversion of use of a structure from office to tourist-accommodation in the city of Rome. Finally, in Sect. 5, the conclusions are discussed.

3 Framework

3.1 The Wealth Gap

In recent decades, economic inequality has reached unprecedented levels. A series of crises has widened the income gap, highlighting the effects of deep-rooted inequalities. Most recently, the COVID-19 pandemic and runaway food and fuel prices have led to poverty and a cost-of-living crisis for many households, while driving relentless wealth and income growth for the richest. The richest 10% of the global population owns a staggering 67% of wealth, while the bottom half of individuals owns just 1.2% (Christensen et al. 2023; Yanatma 2024). In Europe in 2022, 21.6% of the population—around 95.3 million people—was at risk of poverty or social exclusion (Riva 2023), while the richest 1% held an average of 11.4% of national income (Openpolis 2024).

The Sustainable Development Goals No. 10 of the 2030 Agenda concerns the reduction of inequalities within and between countries. Specifically, a relevant increase of the income growth rate of the poorest 40% of the population is the main aim. In terms of this target, Italy ranks the second to last position among EU member states.

Net worth or "wealth" is defined as the value of financial assets plus real assets (mainly housing) owned by households, minus their debts. Its unequal distribution is measured by the *Gini* coefficient and the share of the top percentile (Hasell 2023). Among the EU's "Big Four" economic powers, Germany had the highest level of wealth inequality (77.2), followed by France (70.3), Spain (68.3) and Italy (67.8). Among the major European countries (namely the EU's Big Four and the UK), wealth inequality, as measured by the Gini coefficient, actually decreased in Germany (− 4.3) between 2000 and 2022. Italy, however, recorded the highest increase of 7.4 points, while it rose by 2.8 points in Spain and by 0.6 points in France (Yanatma 2024).

3.2 Housing Disparity and Hospitality Trend

The relationship between housing and poverty is evident. The growing salience of inequality and, relatedly, wealth has resulted in newfound attention to housing as a central component of private household wealth. Households' living conditions are closely linked to their economic situation (Ansell and Cansunar 2021). People living in poverty or precarious conditions face challenges in accessing the housing market. While a minority deals with problems related to the size, location and quality of housing for the majority rental prices constitute the main concern (Stone 2006), which consumes a significant part of their income (Pittini 2012). This highlights the complex relationship between economic status and housing conditions and the need for policies that address both income inequalities and housing affordability. On the other hand, the ultra-high net worth individuals have become the protagonists of property investment (UBS 2023). In this perspective, the relevant investments in the hospitality segment by millionaires should be pointed out. The recorded data indeed indicate investment volumes of about 1.2 billion euros, consolidating Italy as one of the most important markets for the main investors in the sector and demonstrating a growing interest in leisure destinations. Further confirming the growing interest in the sector, these volumes are added to those related to other asset classes, which foresee a future hotel use and would bring the total volumes to 1.4 billion euros (Jadeluca 2023). The projections provided by Savills Research (2024) indicate that, in terms of hotel capacity, there is an expected increase of 49.3% in the existing luxury hotel assets in Europe. This corresponds to a total of about 4000 new rooms that will enter the market. In the five-year period preceding the pandemic, the sector recorded an average annual growth rate of about 2.6%. However, in the post-pandemic period, between 2023 and 2028, growth is expected to more than double, with an average five-year growth rate projected at 6.7%. In recent years, the city of Rome has been affected by a significant increase in investments in the hospitality sector. This trend reflects Rome's attractiveness as a global tourist hub and business centre. This kind of investments has involved both the inauguration of new facilities and the redevelopment of existing buildings. The facilities are predominantly up-scale and luxury hotels. Prestigious assets, known as "trophy assets", have aroused particular interest, often becoming the subject of "value-add" investments aimed at the total conversion of the use (initially non-receptive) or the redevelopment for a subsequent repositioning on the market.

4 Case Study

In order to examine the quantification of the EUC, conceived as an effective compensation mechanism for the community resulting from private investors' extra-profits, this research specifically concerns a property located in the city of Rome, for which a change in use is planned. A change of the intended use is provided for the property in analysis: from private directional use (offices) to hospitality function (luxury hotel).

The compendium is a historic structure, built between 1936 and 1940, covering an area of about 20,000 m^2, distributed over seven floors above ground and a basement. As indicated in Fig. 1, the property is located in the first Municipality (*Rione IV Campo Marzio*) of the city of Rome. The territory of the first Municipality includes the central part of the city, comprising all the districts of the historic centre, recognized as a UNESCO World Heritage site. According to the General Regulatory Plan (PRG) for the city of Rome, it emerges that the property falls within the settlement system "*Città storica - Tessuti di ristrutturazione urbanistica otto-novecentesca - T3*": this classification underlines the historical and urban importance of the building, as well as its potential role in the redevelopment and enhancement of Rome's architectural heritage.

According to the Urban Planning Regulations of the city of Rome, the change of the provided intended uses of a property is subject to the payment of the EUC, determined as the 66.6% of the generated plus-value (P) (Campo 2015), i.e. the difference between the market value of the property "with" the eligible intended uses (Vm_1) and the market value of the property in the actual condition (Vm_2), i.e. "without" the possibility to realize the new intended uses:

$$P = Vm_1 - Vm_2 \quad (1)$$

Market value "with" the eligible intended uses (Vm_1). The new destination is constituted by a tourist-accommodation facility. The market value of the property has been determined by implementing a Discounted Cash Flow Analysis (DCFA) (RICS 2023). In particular, the valuation is based on the income generated by the hotel activity, i.e. estimating the normal incidence of the market rent on the hotel's annual revenues, and considering the operative costs of an ordinary owner.

The potential revenues of the hotel are assessed on the basis of a financial balance sheet, taking into account the characteristics of the area (tourist interest, availability of accommodation infrastructure, catchment areas), the characteristics of the property, the types of activity and the profitability levels of the sector. Therefore, a competitive set has been collected, in order to determine the evolution of the tariffs (and so of the revenues) over the year for the hotel in analysis, even by considering the revenues related to other services (i.e. restaurant, bar, conference centre and auditorium). The incidence of the market rent on the potential revenues is expressed as a percentage of 28% (Morri and Trimarchi 2020). The risk associated with periods of vacancy has been taken into account by considering a reduction percentage of 3% per year of the market rent. An analysis period equal to ten years has been assumed.

Regarding to the investment costs, needed for the transformation of the property (from office to luxury hotel), considering the prestige and refinement of the materials selected for the compendium, an amount equal to 300,000€ per room has been assessed, to be temporally referred to the first two years of the analysis period in the DCFA development.

The operative costs annually borne by the owner are analytically determined (property management, extraordinary maintenance costs, insurance, registration tax, property tax). The cost items charged to the property and their respective percentage incidences, estimated with reference to ordinary market conditions in the reference context, are as follows:

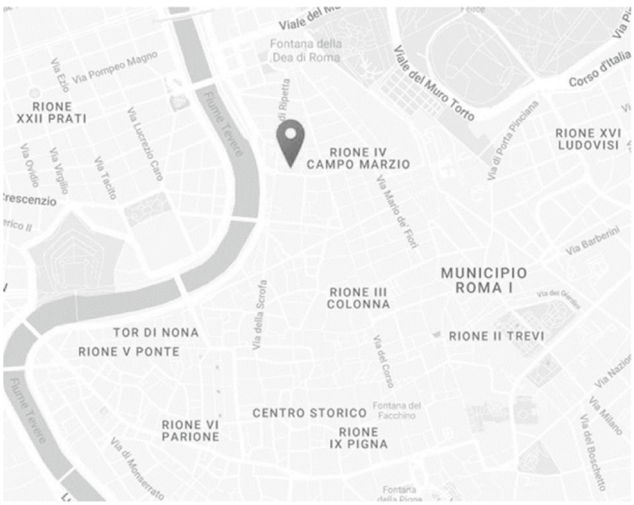

Fig. 1 Localization of the case study. *Source* Figure created by Author

- property management: equal to 1.50% of the market rent;
- extraordinary maintenance costs: a fund is envisaged for the renovation of the property, equal to 1.20% of the construction costs of the property (CCP), equal to 33,900,000€;
- insurances: equal to 0.12% of the CCP;
- registration tax: equal to 0.50% of the market rent;
- property tax: equal to 7.00% of the market rent. The amount has been kept constant for the first three periods of the cash flow, to be then indexed by reason of the planned inflation (2.0%) from the fourth year until the end of the analysis period.

The annual market rents and costs have been annually updated, according to an appropriate inflation rate. In particular, 5% in the first year, 3.50% in the second year and 2.00% starting from the third year onwards have been assumed for this parameter in the analysis.

The discount rate is assessed by considering the return on an alternative risk-free investment (typically assumed to be equal to the average yield of government bonds with a maturity homogeneous with respect to the reference time horizon) and the remuneration of the risk inherent in the operation (i.e. the premium linked to the possibility that the investor does not receive the expected flow at the expected date). Specifically, the discount rate has been determined by borrowing the logic of the Weighted Average Cost of Capital (WACC): a financial structure composed of 50% of equity means and 50% of third-party means is hypothesized; taking into account Treasury bonds rates and the specific investment risk (geographical context, suitability of the location to the intended use, real estate market trend; consistency, type/quality of building and maintenance, vacancy risk, solvency), the discount rate is assumed equal to 8.00%.

The terminal value has been determined by projecting the annual market rent to the end of the analysis period and applying an "exit" rate (going out cap rate) equal to 6.25%, i.e. the capitalisation rate of the property (based on the location, conditions of use and characteristics of the property) plus an appropriate spread to reflect the risk associated with this type of long-term projection. Marketing costs for the selling of the property have been considered, equal to 2% of the assessed terminal value.

Table 1 reports the development of the DCFA for the determination of Vm_1: the market value of the property "with" the eligible intended uses is equal to 336,877,000€.

Market value of the property in its current condition (Vm_2). This assessment has been developed by using the DCFA in the situation "without" the possibility to realize the new intended uses, i.e. considering the originary intended use of the property ("office"). The market rent for the "office" intended use has been assessed by considering the trade area in which the property is located and by finding appropriate rented compa-

Table 1 DCFA for the determination of Vm_1

Years			1	2	9	10
Inflation rate			5%	3.50%	2%	2%
Revenues						
Market rent			2,600,000€	2,600,000€	35,805,255€	36,521,360€
Vacancy			3%	3%	3%	3%
Total revenues			2,522,000€	2,522,000€	34,731,098€	35,425,720€
Costs						
Investment costs			20,340,737€	13,560,492€		
Property management	1.50%	Market rent	37,830.00€	37,830.00€	520,966€	531,386€
Extra maintenance costs	1.20%	CCP	406,815€	421,053€	486,029€	495,749€
Insurance	0.12%	CCP	40,681€	42,105€	48,603€	49,575€
Registration tax	0.50%	Market rent	12,610€	12,610€	173,655€	177,129€
Property tax	7%	Market rent	182,000€	182,000€	1,406,456€	1,434,585€
Total costs			21,020,673€	14,256,090€	2,635,709€	2,688,423€
Cash flows			− 18,498,673€	− 11,734,090€	32,095,388€	32,737,296€
Discount rate	8.00%					
Discounted cash flows			− 17,128,401€	− 10,060,091€	16,055,685€	15,163,702€
Going out cap rate	6.25%					
Total net cash flows	99,109,910€			Terminal value (gross)		523,796,739€
Discounted terminal value	237,766,854€			Marketing costs		10,475,935€
Market value	336,876,763€			Terminal value (net)		513,320,804€
Market value (rounded)	**336,877,000€**					

Table 3 Determination of the EUC

Market value "with" the eligible intended uses (Vm_1)	336,877,000€
Market value of the property in its current condition (Vm_2)	148,979,000€
$P = Vm_1 - Vm_2$	187,898,000 €
Share of public benefit	66.6%
Public benefit	66.6% · 187,898,000 = 125,140,068€

rables, in order to then perform a market comparison approach method. The same logic-operational procedure previously conducted has been carried out for the determination of the operative costs, the discount rate (= 6.90%), the going out cap rate (= 5.15%).

Therefore, Table 2 shows the implementation of the DCFA for the Vm_2 assessment. The market value of the property in its current state is equal to 148,979,000€.

Plus-value and determination of the EUC. The plus-value generated (P) by the project proposal, which involves a change of the intended use of the property, amounts to 187,898,000€. In Table 3 the EUC has been determined, equal to 66.6% of P, i.e. to an amount of 125,140,068€.

5 Conclusions

The growth of a region depends not only on natural resources or capital formation (Berritto 2023) but also on the presence of public and private actors who make innovative decisions and generate economic and social progress. In this context, attention is focused on tools that can create compensatory processes. Urban planning charges are the most appropriate tool for taxing the extra-rents emerging from urban planning transformation and providing municipalities with the appropriate resources to improve the territories. However, in Italy, the charges paid for public services represent an almost negligible portion of the rents, ranging between 3 and 5% of the construction value, compared to 28–30% in Germany. This disparity is evident: transformations increase rents but leave marginal resources for the community (Camagni 2019).

The payment of Extraordinary Urbanization Contribution (EUC) aims to compensate the community for the impact of urban changes while ensuring benefits to the local community. This mechanism of compensation allows to activate a virtuous chain: agglomeration advantages attract new activities and generate development; from development, incomes (business profits, wages, and especially rents) arise, from which, through an appropriate taxation, the resources for new public goods, new infrastructure, and new services can derive,

Table 2 DCFA for the determination of Vm_2

Years			1	2	9	10
Inflation rate			5%	3.50%	2%	2%
Revenues						
Market rent			9,000,000€	9,315,000€	10,752,458€	10,967,507€
Vacancy			3%	3%	3%	3%
Total revenues			8,730,000€	9,035,550€	10,429,884€	10,638,482€
Costs						
Property management	1.50%	Market rent	130,950€	135,533€	156,448€	159,577€
Extra maintenance costs	1.20%	CCP	319,920€	331,117€	382,214€	389,858€
Insurance	0.12%	CCP	31,992€	33,112€	38,221€	38,986€
Registration tax	0.50%	Market rent	43,650€	45,178€	52,149€	53,192€
Property tax	7%	Market rent	630,000€	652,050€	752,672€	767,726€
Total costs			1,156,512€	1,196,990€	1,381,705€	1,409,339€
Cash flows			7,573,488€	7,838,560€	9,048,179€	9,229,143€
Discount rate	6.90%					
Discounted cash flows			7,084,647€	6,859,317€	4,963,201€	4,735,701€
Going out cap rate	5.15%					
Total net cash flows	58,849,774€			Terminal value (gross)	179,232,626€	
Discounted terminal value	90,129,319€			Marketing costs	3,584,653€	
Market value	148,979,093€			Terminal value (net)	175,647,973€	
Market value (rounded)	**148,979,000€**					

thus relaunching the growth process (Lattarulo and Petretto 2016).

The case study analyses the current situation in Italy, focusing on the first municipality of Rome, that is an area significantly affected by the increasing proliferation of accommodation facilities. This phenomenon has led to a progressive reduction in the availability of residential housing, making it increasingly difficult for the local population to access affordable housing solutions. The expansion of short-term rentals, equivalent to hotel stays, has increased the demand for accommodations, thereby further reducing the supply of long-term housing. This trend has displaced residents towards peripheral areas, exacerbating the marginalization of the most vulnerable segments of the population (*Inside Airbnb* 2024). According to the statistical bulletin of the Municipality of Rome (Bollettino statistico 2024), between 2016 and 2021, the population of the first municipality declined by over 5%—i.e. the most significant reduction compared to other areas of the city—while in the same period, short-term rental surpassed 32,200 units, with more than 50% concentrated in the historic centre of the city. In this context, the compensatory mechanism of the EUC plays a crucial role in redirecting a share of the extra-profits generated by the private investments towards innovative forms of urban densification, seizing the opportunity to integrate the physical regeneration with the social revitalisation (Delera 2012). The academic literature has extensively explored the issue of the plus-value generated in relation to social housing as a response to housing inequality, by highlighting how private sector interventions in the urban landscape can encourage inclusive policies by the public administration (Calavita et al. 2010; Della Spina et al. 2020). This approach aligns with a long-standing tradition of research in the fields of valuation and economics. In particular, two historical cases are specifically significant in understanding the evolution of such mechanisms: the first concerns the reconstruction of London after the Great Fire of 1666, when landowners whose properties fronted the streets were required to contribute financially to public costs for the widening and paving of the streets; another example is the transformation of Paris in the nineteenth century, during which private landowners were required to contribute financially to urban renewal projects in proportion to the benefits derived from the increased value of their properties (Paccoud 2012; Peterson 2009). Currently, many countries worldwide—including all Western nations—have been adopting various compensatory models: countries such as Colombia (Bogotá), Brazil (São Paulo, Rio de Janeiro), and India have introduced national legislation on land value sharing, also promoting the taxation of value increments in areas benefiting from improved accessibility (Camagni 2016). These interventions have funded major urban infrastructure projects. However, identifying concrete and documented cases of such practices in specific contexts remains a relevant challenge. Indeed, specific information data on these initia-

tives are often difficult to obtain, as it lacks adequate documentation or sufficient details in available sources. Finally, it is important to note that a community's inability to capture plus-value may lead to underinvestment in new infrastructure or, in some cases, reluctance to grant urban planning permits, with adverse consequences for the urban system (Falco 2016).

Therefore, the EUC can contribute to the urban regeneration, which includes not only building-restorative initiatives but also scenarios aimed at eliminating social degradation, increasing residents' quality of life, supporting the enhancement of cultural resources, protecting the cultural and environmental heritage, and fostering economic development (Bottero and Mondini 2017).

Note: The current study has been developed within the research "Resilience and sustainability of urban regeneration initiatives. Methods for assessing the effectiveness of investments on the built environment", Call for Research Projects 2022, Sapienza University of Rome.

References

Adorni, D., & Tabor, D. (2019). *Inchieste sulla casa in Italia: La condizione abitativa nelle città italiane nel secondo dopoguerra.* Viella.

Ansell, B., & Cansunar, A. (2021). The political consequences of housing (un)affordability. *Journal of European Social Policy*, *31*(5), 597–613. https://doi.org/10.1177/09589287211056171

Battisti, F., & Campo, O. (2018). A Procedure for Determining the Industrial Profitability of Settlement Interventions in the Appraisal of Exceptional Contribution of Urbanisation. In O. Gervasi, B. Murgante, S. Misra, E. Stankova, C. M. Torre, A. M. A. C. Rocha, D. Taniar, B. O. Apduhan, E. Tarantino, & Y. Ryu (Eds.), *Computational Science and Its Applications – ICCSA 2018* (Vol. 10962, pp. 34–50). Springer International Publishing. https://doi.org/10.1007/978-3-319-95168-3_3

Berritto, A. (2023). *Politiche urbane e processi di rigenerazione del polo universitario di San Giovanni a Teduccio a Napoli. Dinamiche di sviluppo e forme nuove di relazione tra università e territorio.* 38–51.

Bollettino statistico. (2024). Roma Capitale. https://www.comune.roma.it/web/it/bollettino-statistico.page

Bottero, M., & Mondini, G. (2017). Assessing Socio-Economic Sustainability of Urban Regeneration Programs: An Integrated Approach. In A. Bisello, D. Vettorato, R. Stephens, & P. Elisei (Eds.), *Smart and Sustainable Planning for Cities and Regions* (pp. 165–184). Springer International Publishing. https://doi.org/10.1007/978-3-319-44899-2_10

Calavita, N., Mallach, A., & Lincoln Institute of Land Policy (Eds.). (2010). *Inclusionary housing in international perspective: Affordable housing, social inclusion, and land value recapture.* Lincoln Institute of Land Policy.

Camagni, R. (2011). *Plusvalori fondiari, perequazione e ricapitalizzazione della città.*

Camagni, R. (2016). *La riforma della fiscalità urbanistica.* Carocci. https://re.public.polimi.it/handle/11311/1013016

Camagni, R. (2019). *Il mistero del 'contributo straordinario'. Rendite da trasformazione urbana, una vicenda inquietante.* https://www.arcipelagomilano.org/archives/51773

Campo, O. (2015). Appraisal of the extraordinary contribution in general regulatory plan of Rome. *International Journal of Mathematical Models and Methods in Applied Sciences.* https://iris.uniroma1.it/handle/11573/787037

Cardoso, I. M. (2011). Análise Comparativa das leis de solos de Países Europeus. *Estudo de Enquadramento Para a Preparação Da Nova Lei Do Solo; DGODTU: Lisbon, Portugal*.

Christensen, M.-B., Hallum, C., Maitland, A., Parrinello, Q., Putaturo, C., Abed, D., Brown, C., Kamande, A., Lawson, M., & Ruiz, S. (2023). *Survival of the Richest: How we must tax the super-rich now to fight inequality.* Oxfam. https://doi.org/10.21201/2023.621477

Credit Suisse. (2022). *Global Wealth Report 2022.*

Delera, A. (2012). Housing Sociale per una nuova morfologia della città/ Social Housing for a new morphology of the city. *Techne*, *4*, 74.

Della Spina, L., Calabrò, F., & Rugolo, A. (2020). Social Housing: An Appraisal Model of the Economic Benefits in Urban Regeneration Programs. *Sustainability*, *12*(2), 609. https://doi.org/10.3390/su12020609

Dewilde, C., & De Decker, P. (2016). Changing Inequalities in Housing Outcomes across Western Europe. *Housing, Theory and Society*, *33*(2), 121–161. https://doi.org/10.1080/14036096.2015.1109545

Falco, E. (2016). History of Land Value Recapture in Italy: A Review of Planning and Fiscal Measures Since 1865. *Journal of Planning History*, *15*(3), 230–245. https://doi.org/10.1177/1538513215615281

Hasell, J. (2023). Measuring inequality: What is the Gini coefficient? *Our World in Data.* https://ourworldindata.org/what-is-the-gini-coefficient

Inside Airbnb. (2024). https://insideairbnb.com/rome/

Jadeluca, P. (2023). Gli hotel di lusso battono la crisi. *La Repubblica.*

Lattarulo, P., & Petretto, A. (Eds.). (2016). *Contributi sulla riforma dell'imposizione locale in Italia* (1a edizione). Carocci editore.

Modigliani, D., Camagni, R., Dongarrà, A., Fonti, L., Messina, G., & Tamburini, M. (2016). *Definizioni e determinanti della rendita urbana: Metodologia di calcolo e applicazioni alla città metropolitana di Roma.* INU Edizioni. https://re.public.polimi.it/handle/11311/1013019

Morano, P., Tajani, F., & Anelli, D. (2021). Urban planning variants: A model for the division of the activated "plusvalue" between public and private subjects. *Valori e Valutazioni*, *28*, 31–47.

Morri, G., & Trimarchi, F. (2020). *Hotel investment & valuation: Metodologie e casi.* EGEA spa. https://books.google.com/books?hl=it&lr=&id=s2TnDwAAQBAJ&oi=fnd&pg=PT7&dq=Hotel+investment+%26+valutation.+Metodologie+e+casi&ots=1k_GwnqQmJ&sig=QwEoXba6k_h9drl9lKlymtyR6Sg

Openpolis. (2024, January 31). Openpolis. https://www.openpolis.it/litalia-e-tra-i-paesi-ue-con-i-divari-di-reddito-piu-ampi/

Paccoud, A. (2012). *A Politics of Regulation: Haussmann's Planning Practice and Badiou's Philosophy.*

Peterson, G. E. (2009). *Unlocking land values to finance urban infrastructure.*

Pittini, A. (2012). *Housing affordability in the EU: Current situation and recent trends.* CECODHAS, European Social Housing Observatory.

RICS. (2023). *Discounted cash flow (DCF) valuation.*

Riva, P. (2023, August 3). In Europa 95 milioni di persone a rischio di povertà o esclusione sociale. *Secondo Welfare.* https://www.secondowelfare.it/povert-e-inclusione/ue-persone-rischio-poverta-esclusione-eurostat/

Savills Research. (2024). *Spotlight: European Hospitality.* https://www.savills.com/research_articles/255800/358096-0

Stone, M. E. (2006). What is housing affordability? The case for the residual income approach. *Housing Policy Debate*, *17*(1), 151–184. https://doi.org/10.1080/10511482.2006.9521564

UBS. (2023). *Global Wealth Report 2023.*

Yanatma, S. (2024). *Mind the Gap! The unfair distribution of wealth in Europe.*