PROCEEDINGS OF

Urban Planning and Architectural Design for Sustainable Development (UPADSD) – 6th Edition 2021

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Urban Planning and Architectural Design for Sustainable Development

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Preface

As many countries around the globe continue their struggle with the Covid-19 pandemic, the world can now see how a single occurrence could tip the scales and influence almost every aspect of our lives, leaving a mark on our cities that will echo for generations. Early research on its effects in cities mainly concerns four themes including environmental quality, socio-economic impacts, transportation, and urban design as well as management and governance, all of which provide planners, practitioners, and policymakers with the best opportunity to contribute to creating more resilient and sustainable cities.

That being said, with this challenge comes a positive secondary impact as it sparks debate, the introduction of innovative solutions, and an improved response to current and future crises. Therefore, it has become vital that new approaches to city planning are introduced to achieve a more resilient and sustainable use of public spaces in the future.

One of the key measures in combating Covid-19 in the past was a complete restriction on the use of public spaces. So how will we adjust to this new normal, and what will happen to those spaces? Questions like these and many others arose in the span of only two years that made us rethink our relationship with public spaces and our environment. A new holistic approach to city planning should be the center of focus in support of climate mitigation, better health, better water and waste management, a more resilient and inclusive Circular Economy, and an effective urban service provision.

This book is a collection of innovative research submitted to the 6th edition of the International Conference on Urban Planning & Architectural Design for Sustainable Development, as well as the 1st edition of the Circular Economy for Sustainable Development. It provides a brief glimpse into the measures that need to be taken to achieve sustainable urban planning and development in a post-COVID world as well as preserve and manage our cultural heritage, improve energy efficiency in buildings, and address issues of urban infrastructure.

Over the past two years, urban vulnerabilities and underlying patterns and effects of the pandemic have been the focus of research published. In this abstracts book, we showcase valuable insights of researchers across the globe who introduce urban models for a post-COVID future, investigate user behaviors towards public building designs and public transport systems and contribute to the development of pandemic-resilient urban development.

Acknowledgements

IEREK would like to express its appreciation to all the members of the staff, scientific committee, chairpersons, and editors for contributing to the tremendous growth of this institution and for making the 6th edition of the International conference on Urban Planning and Architectural Design for Sustainable Development and the 1st Edition of the Circular Economy for Sustainable Development International conferences a success.

IEREK would also like to thank the conference chairpersons, Professor Francesco Alberti and Professor Fabio Pollice, who are the core reason as to why this conference was transformed from a mere vision into real life success. This institution is greatly indebted to IEREK's advisor and Italian Alliance Director, Prof. Ferdinando Trapani. IEREK takes distinct pride in being an institution that amasses a highly qualified and competent team who restlessly worked for months to make this conference what it is today. As for the success of this conference, any step forward towards the ultimate goal of creating a well-rounded society was made possible by the highly reputable scientific committee that worked competently to prepare for and revise research papers. It would also like to give thanks to all the members of the Scientific Committee who made it their duty to help this institution spread knowledge to the masses.

WORD BY THE CONFERENCE CHAIRPERSON

For the second year in a row, IEREK Conference on Urban Planning and Architectural Design for Sustainable Development, organized with the scientific support of the Department of Architecture of the University of Florence, has migrated onto the web because of the Covid-19 pandemic.

A big debate has arisen worldwide on what will be the long-time consequences of this dramatic experience, which, differently from the last edition of the Conference, is often mentioned by the authors of the submitted papers as the current state of affairs.

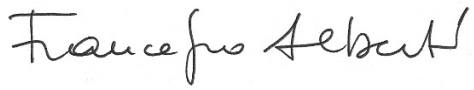
It is a widespread opinion that when we will have left the sanitary emergency behind, never will be the same. So, the question is: will we be better off?

The only possible answer is: it just depends on us, as well as for all other emergencies about the planet's and its inhabitants' health and survival that have been temporarily obscured by the pandemic: global warming, pollution, soil consumption and depletion, exploitation of natural resources above their thresholds for reproduction, reduction of biodiversity. Without forgetting that such environmental emergencies go hand in hand with the social and economic sustainability ones called into question by the seventeen SDGs of the United Nation Agenda 2030.

It just depends on us - where "us" stands both for members of the human race and specifically for researchers, professionals and educators in the fields concerning the human habitat: urban planner and designers, architects, engineers, landscape designer, agronomists, etc.

The papers presented at this edition of the UPADSD Conference are a significant testament to how disciplinary research is already able to provide advanced analysis tools and innovative design approaches to address the challenges we face.

The hope is therefore that the Covid-19 pandemic can be soon left behind and remembered as a painful but decisive turning point in the collective awareness and assumption of responsibility, so that research lines and concepts such as those presented in this anthology can germinate and grow worldwide.



Professor Francesco Alberti
Professor at the Department of Architecture (DiDA),
University of Florence, Florence Italy.

Word from the Chairman of the Board of IEREK

First, I would like to state that it is my honor to be launching this joint conference on the vital themes of Urban Planning for Architectural Design and Sustainable Development (UPADSD) 6th edition and Circular Economy for Sustainable Development (CESD) 1st edition of its kind.

Second, I would like to praise IEREK's efforts in establishing this successful event. IEREK- International Experts for Research Enrichment and Knowledge Exchange - is an institution that began pursuing its goal of reaching excellence in the research field in 2013, and since then has been linking scholars from around the world and providing them with a platform that would advance all their innovative efforts. All the while achieving IEREK's main goal of building international relationships with prestigious universities and institutes worldwide, spreading knowledge, and enhancing research around the world, through collaborating with trustworthy partners who share its same vision.

With this undertaking, IEREK hopes to present the world with a conference that positively contributes to its field and paves the way for scholars to combine their ideas for the greater purpose of discovering new and innovative solutions to today's issues, along with the aid of our scientific committee of distinguished professors and researchers from a range of established universities from around the globe.

Finally, I hope that the conference succeeds in delivering its message to the world of professionals in the various concerned disciplines to inspire that their work be made a reality. I also welcome all audiences, from undergraduate to postgraduate students, and all who could benefit the most from this conference. I look forward to seeing you all and to collaborating on this prosperous experience.

Mourad S. Amer

Architect, B5c, DSc, MSc, PhD

IEREK CEO

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Part I
Past and Future: City's Image and Preservation

A Study of Urban Size Control in the Japanese Understanding of Garden Cities in the Early 1900s

Junko Sanada [1]

[1] *Associate Professor of Department of Civil and Environmental Engineering at the Tokyo Institute of Technology, Tokyo, Japan*

Abstract

The concept of the compact city has been attracting attention from the perspective of sustainable and natural resources, but in Japan, suburban development is still thriving, causing the problem of hollowing out of the city center. The idea of a compact city does not seem to be widespread in Japan. However, there was the garden city movement in the early 1900s which was the period around 1919's first city planning law was enacted. In order to promote compact cities in Japan, it is meaningful to clarify the thinking of the early days of statutory urban planning in Japan. Therefore, this study aims to clarify how the garden city was interpreted in the early days of urban planning in Japan, focusing on urban expansion.

The materials used were journals and academic books published between 1907, when the garden city was first introduced, and 1927, when the subject of urban planning shifted to park systems. To ensure that the articles were written by experts of the time with some sort of argument, so translated articles, visits, and textbooks are eliminated, and 29 discourses are used for analysis.

As a result of the study, the following three points became clear: (1) In most of articles on the garden city, the subject of the commentary was the city that was actually built. Howard's garden city was an "ideal". (2) Urban problems in the articles on garden city were "urban overgrowth," but this term means the concentration of population and the dense conditions. Some experts favorably understood this as urban development. (3) There were many experts who introduced the garden city without mentioning the size of city. They were not interested in the surrounding farmland, and when they did explain it, they saw it as a place where they could enjoy the richness of nature.

Keywords

Garden City; Compact City; Urban Expansion; Urban Sprawl; Green Belt;

Introduction

The concept of the compact city has been attracting attention from the perspective of sustainable and natural resources, but in Japan, suburban development is still thriving, causing the problem of hollowing out of the city center. The idea of a compact city does not seem to be widespread in Japan. However, there was the garden city movement in the early 1900s which was the period around 1919's first city planning law was enacted. Since its first introduction in 1907, the garden city has been featured in many journals and books.

In reality, however, the Garden City movement landed as a suburban residential development. It can be said that the idea of the garden city, which originally started as a denial of enlargements of cities, resulted in the expansion of the city. If looking at the books and articles of the time that mention the garden city, the phrases "Bochou" and "Kadaika" are frequently used. They are words that describe the growth or expansion of cities. Why, nevertheless, did the interpretation of the garden city result in the promotion of urban expansion? In order to promote compact cities in Japan, it is important to clarify the thinking of the early days of statutory urban planning in Japan. Therefore, this study aims to clarify how the garden city was interpreted in the early days of urban planning in Japan, focusing on urban expansion.

A number of studies have been published on the understanding of the garden city. In "A Study of the Japanese Garden City (1) ", Shunichi Watanabe mentions the Garden City Corporation and says that what this company developed was "not the Howardian garden city"(Watanabe, 1977). And in "A Study of Japanese Garden City (2)",

he refers to the work "The Garden City" written by volunteers from the Ministry of Home Affairs' Regional Bureau, and points out that it was based on Sennett's work, not Howard's (Watanabe, 1978).

Akinobu Murakami has also conducted a number of studies on the Japanese understanding of the garden city. In addition to research on the understanding of Howard's theory by Tokitaka Yokoi (Murakami, 1997) and Kazumi Iinuma (Murakami, 2000), he has also conducted research on the background to the translation of Howard's "Garden City" as "Denen Toshi (in Japanese means rural city)" by the Regional Bureau of the Ministry of Home Affairs (Murakami, 1999). Murakami says that the Home Ministry volunteers used the term "Denen Toshi" as a term to describe "the trend of Western countries", and points out that they did not necessarily try to understand Howard's theory. These studies, however, attempt to clarify the Japanese understanding by pointing out the differences with Howard's garden city theory.

Yasuo Nishiyama, in his review of the pre-World War II Japanese literature on the garden city, points out that the garden city was understood as a countermeasure against rural exhaustion, a development measure for suburban areas, a housing design, and a district design method (Nishiyama, 1981), but he does not clarify how this understanding led to the expansion of the city.

Conclusion

In order to clarify how the garden city was interpreted in the context of urban expansion, articles about the garden city were used as data and read with a focus on the expansion of the city. As a result, the following points became clear:

i) Many of the commentaries on the garden city focused on the actual cities that had been built; in the early 1920s, some interpreted Howard's garden city as an 'ideal', as opposed to the 'practice' reflected in the UK Housing, Town Planning, &c. Act. and actual cities building.

ii) Since these articles explain the garden city as a method of town planning, they inevitably refer to urban problems. Most of the urban problems mentioned in these articles were "*Bochou*" and "*Kadaika*", but most of them were mainly about the concentration of population in the cities and the resulting dense conditions.

iii) The garden suburb was often understood as a continuation of the garden city ideal.

iv) The agricultural land around the city, which is a component of the rural city, also functions to control the expansion of the urban area. However, about a third of the discourses did not mention the existence of farmland itself, or only described it as a component, while many others saw it as a place where people could enjoy the richness of nature and where farmland could be used for production.

From the above, the following considerations are made.

・It is likely that the professionals of the time focused on the garden city, not to learn Howard's garden city as a theory, but to learn a viable urban planning method that had already been put into practice.

・It is thought that the garden city was accepted as a solution to the concentration of population in cities and the resulting dense conditions.

・In addition to the meaning of a solution to dense population, it can be considered that the fact that the agricultural land around the city was interpreted as a place where people could enjoy the richness of nature led to the solution of a low-density suburban city with many opportunities for contact with nature.

It can be said that the reason for the expansion of cities at the at the early stage of city planning was that the "quality of the part" as the living condition was more important than the city itself.

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Cultural Heritage Management and Sustainable Tourism in Historical Cities (Case study: Durrat Al Nil Park, Station square and the old tourist market in the historical Aswan City – Egypt)

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[1]Assistant Professor, Department of Architectural Engineering, Faculty of Engineering in Shubra, Benha University

Abstract

This paper aims to study cultural heritage management and sustainable tourism in historic cities and display the Experiment of the historical Aswan city in Egypt to rehabilitate and develop Durrat Al Nil Park, the Station Square, and the Old Tourist Market. This is presented through a theoretical study of the cultural heritage management's concept and its stages in integration with the principles of sustainable tourism, commercial, historical markets, and streets. As these sites are one of the most valuable sites in city centers, to reach a successful relationship between human and his needs, whether as a tourist or a resident in the city; and a sustainable visual image of the historical cities. As a result, similar criteria between cultural heritage management and sustainable tourism will be easily set to develop the historical cities' downtowns. These criteria help to prepare a field study to develop Durrat Al Nil Park, the Station Square, and the Old Tourist Market within 2020-2021, as Aswan city was chosen with another 30 cities all over the world to win Guangzhou International Innovation Award for civilized innovation. Also it will help to analyze before and after the development. This paper is carried out within these criteria and principles of cultural heritage management, to see if they are matching to reach an approach that helps to reserve the sustainable visual image of the city and the authenticity of its heritage within the framework of cultural heritage management concepts and sustainable tourism.

Keywords

*Cultural Heritage**;** Cultural Heritage Management**;** Sustainable Tourism**;** Aswan City**.***

Introduction

Aswan is one of Egypt’s most historically valuable cities, which locates on the shores of the Nile River, as it has some of the most famous and significant archeological places (for example: the temple of Philae, Abu Simbel, and Kom Ombo). Therefore, there are many challenges to develop such an important historic urban area because it is necessary to find the balance between protecting the cultural heritage and meeting the needs of the residents and the visitors now and in the future.

Dvevloping this city requires extreme caution because such historical cities are witnesse and symbol of a country’s history and act as an identity among other countries and nations. So, poor planning causes to damage and lose these amazing culture and identity. As a result, this research will help to find the optimal approach for developing this important city. The research procedures will include collecting a lot of data about cultural heritage of this city and how to integrate with the principles of sustainable tourism. The research will too collect data about commercial and historical markets ; as one of the important and influential places in the city. A mutual set of rules and a specific criterion were set to be followed to compromise a successful relationship between people and their needs whether are tourists, city residents, or employees to achieve the targeted sustainable visual balance in this historical remarkable city.

Results

the cultural heritage management criteria have been found through the tourist sustainable and which have been proved. Where theses achieved criteria after the implementation have presented high rates (the field of the station 81% - the old tourist market 75% - the Durrat al-Nil Park 78%) and these criteria were based on covering the

dimensions and axes of cultural heritage in the context of sustainable tourism and it is (economic and urban - the natural and cultural - social environment. All the previous can be presented in the following form:

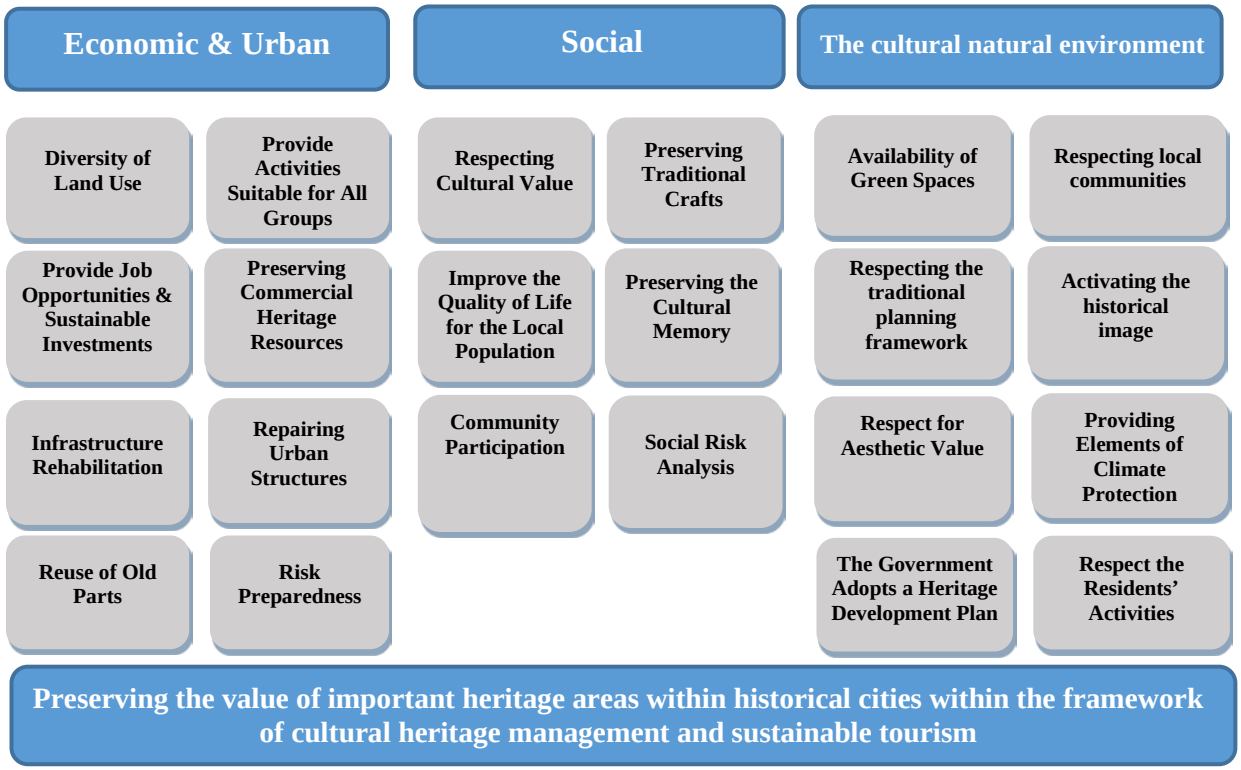

Figure 21. Shows the critera for value presrving within the framework of cultural heritage management & sustainable **tourism(researcher, 2021)**

Recommendations

The three areas are still in a need to overcome their weaknesses points, Such as:

- Encouraging Encouraging sustainable investments and increasing job opportunities.
- Providing visual, audible and readable means that work to market local products.
- Encouraging the awareness among the residents of these areas to maintain development and focus on improving the quality of life for the local population.
- Re-study the immediate biosphere in the three study areas, as a result of the difference between the areas that have been developed and their immediate vicinity.
- The three areas are still in a need to more entertainment elements and providing areas for children, especially in the old tourist market.

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New planning tools from emergencies

Ludovica Gregori

University of Florence

Abstract

Natural disasters cause traumas, thus social breakdowns. Living in post-emergency settlements is an opportunity for community recovery. This potential is identified here in open space, a constant element regardless of the adopted housing systems and catastrophe. Open space guidelines for temporary settlements are proposed as resilient tools for sociality. The further development foresees to translate the guidelines in spatial parameters to be used in widespread BIM planning software and become design tools for different social contexts.

Keywords

Emergency; urban sociology; open space; community resilience; spatial parameters; BIM.

1. Community-focussed urban answers for traumatic experiences

Natural or man-made emergencies clearly connect social and psychological difficulties to architecture: the loss of the built environment follows that of the identity of the place, which made up the social geography (Calandra et al., 2016) of the inhabitants. Architecture, specifically open space design, can be a healing tool in trauma recovery after a disaster. Open space is the connective tissue of urban systems, bearer of identity and collective life. It compensates for personal difficulties by promoting community strength. Thanks to its better transformation's capacity than the built environment's one, open space design strategies can become resilient tools for sociality. The study of fragile post-emergency settlements, including temporary ones, provides new inputs to create time-sensitive resilient urban answers to foster social liveliness in every situation.

The Master Thesis "Social reconstruction in post-seismic emergency" investigated the role of Architecture in the post-earthquake scenario in the Italian "inner areas" ("aree interne") and it is the base for a further development currently carried out through a PhD program at the Architecture Department of the University of Florence (2020-2023). The importance of this topic can be summarized in the fact that by underestimating the social rehabilitation after a disaster there is a risk of rebuild places for communities that do not exist anymore due to the individual fragility of their members. These events shatter mental health assumptions formed in the context of community life; since trauma leads to social de-bounding, trauma recovery involves community reconstruction (Gordon, 2004). Projects, even temporary ones, are considered necessary to foster social unity and community resilience (Mela, 2017) and the post-emergency phase appeared to be the most delicate time as it sits between the loss of social geography and the creation of a new one. Community recovery, «the material and immaterial reconstitution of the community» (Mela, 2017) starts here. Thus, this research developed design tools for open spaces in post-disaster settlements to facilitate social interactions to support trauma healing.

Final considerations

This work aims to support authorities that need simple and tested tools in response to the emergency. These user-friendly guidelines can be used by administrations and designers and understood by the citizens themselves; thus, all stakeholders are equal actors in the dialogue for a participatory design (Berni, 2015).

The theme of this research revolves around the role of architecture in people's lives after a natural disaster. Architecture can have an active role in trauma recovery after a disaster: if the new built environment promotes social interaction between the members of the community, it could be a healing tool or, on the other hand, it could prevent inclusion and foster isolation.

It was fundamental to define the phase in which architecture can be an efficient tool for trauma recovery. Theory studies on shock handling and the experiences of psychologists who supported the population of the case study showed that life in temporary housing is the best opportunity for the community to heal before reconstruction. Most

of their layouts are based on mere functionality. The design choices will have long-term repercussions on the inhabitants physical and psychological well-being. It could be less worthwhile to spend material and economic resources to reconstruct villages or cities for people that are adverse to each other and are not able to share their common condition due to their individual fragility which could lead them to even abandon the territory.

As in this research, social sustainability is more often considered on a par with or even preparatory to environmental and economic sustainability. To achieve this, Europe provides co-design and co-implementation in urban development and daily policy to ensure the well-being of citizens. In the 2030 Agenda for Sustainable Development programme the mentioned theme is central: disasters caused by climate change, unstable political or social conditions and natural or anthropic disasters, and the associated risks and resilience.

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Urban planning & cultural landscapes preservation facing coastal sprawl: A case study of Annaba coast, Algeria

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Abstract

Right from the beginning of human life, sea has played an essential role as a shaper and generator of urbanization were all the ancient civilizations were founded along. Accordingly, these territories have an important cultural heritage that represents a source of identity, which plays a key role in maintaining the link between past and future. In fact, while cities grow and their populations increase, their planning becomes a challenge for sustainable development. Throw different forms and mechanisms coastalization phenomenon is materialized, by the massive occupation of populations and industrial activities along coastline. In this vein, coastline endures many conflicts, which led to landscapes degradation and changes in the global of its structure and image. The aim of this article is to contribute to bridge the knowledge gap, by discussing planning approaches and challenges related to managing cultural and coastal landscapes, facing the impact of coastal sprawl. The present paper is based on a landscape analysis; it interviews the urban, social, juridical and morphological context through the lens of Annaba's coastline, which contributes strongly to the identity and history of conquest of the city and the landing of the marine army on the 27th of March, 1832. It serves as a practical study case; in addition the paper examines how the process of coastalization affects the cultural heritage based on the monograph of one of the valuable French colonial constructions in Algeria. Lastly the study will provide important results for future adjustments, potential enlargement of knowledge and more appropriate methodologies associated with tools that correlate the specificity of coastline and the presence of the cultural assets.

Keywords

Urban planning; Cultural landscapes; Coastalization; sprawl; Heritage.

1. Introduction

Urbanization and in specific sprawl, has for quite a long time been a main issue in urban analysis and planning strategies. There can be no doubt that the foremost tradition in urban studies has given sparse intention to water in urbanization. The few researches traded waterscapes as a case in studies of social, environmental, and economic perspectives focusing on the physical and natural aspects. Beyond the simple effect of location or contact with the sea, is shaped coastal landscapes. Composed both by natural and human factors related to activities near or far to the sea and also all cultural assets and architectural heritage. Despite that, the coastline is a victim of its own assets, its richness, shared and governed at the same time by a plurality of texts, often indecisive applied in an uncoordinated manner by the institutions. This has stimulated the expansion of coastal territory and gave rise to greater inequality. Within the realms of urban planning and population growth, urban planners and architects have adopted many challenges. The results provide some insights cultural landscapes conservation in order to take into account the specificity of coast and the several phenomenons that could threaten its components. It then summarizes the country practices in the management of coastal landscapes. Therefore, it challenges the knowledge of the impact of coastal sprawl, coast requirements for urban development and also the preservation of both cultural, natural & social dimension of coastal landscapes.

2. Conclusion

The recognition of the huge impact of coastalization practices and understanding its implications and causes allows the preservation of urban landscapes, to ensure their continuity. In this study, we identified and investigated the factors correlated with coastalization related to changes of the image and landscape structure in the selected area. During the evaluation of the studied case we confirmed that it conceals various historical values which contribute, to its role as a place of exchanges and sociability in Annaba's coast. In fact, the conclusions explain the contradictions between the threat of coastalization and cultural landscapes preservation and the continuation of development with no respect of tools that leaded to intensifying those risks. Furthermore, it reflects the present attention given in order to find an approach, which integrates both urban conservation and development in balance with social, environmental, and cultural considerations. However, beyond the proposed

development project that have been presented as a solution to this scientific work, the present study provides empirical results from the above mentioned, with important lessons in terms of knowledge relative to the legislation preserving the coast as an entity composed of both cultural and natural & social components. In the same way that the approached subject opens the way to researches in the thematic for preservation tools and instruments that adapt with the specificity of coast and the presence of heritage in this territory.

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"Restructuring the Public Transportation of Hubballi Dharwad by Bus Rapid Transit System"

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Abstract

Public Transportation is growing as a major urban issue in India. Many cities and towns are suffering due to lack of efficient Public Transportation, which results in traffic congestion, pollution and overall image of degradation. Bus Rapid Transit System (BRTS) is used all over the world as a means of efficient Public Transportation. BRTS is a bus based high quality and capacity system which delivers fast, convenient, accessible, comfortable and cost effective urban mobility. This paper discusses introduction of BRTS as a major Public Transportation of Hubballi-Dharwad and also throw light on Design, Implementation and managing a BRTS. Hubballi-Dharwad are twin cities, in phase of their growth and expansion and the cities of that scale require an affordable, reliable and safe public transit network that would enable people to commute to different destinations in the shortest possible time and in the easiest possible manner. Hubballi-Dharwad BRTS is a strategic intervention to ease existing traffic congestion, integrate existing infrastructure and to create opportunities for improvement in land use, to allow quick and inexpensive implementation. HDBRTS is financed by World Bank, Govt of India and Govt of Karnataka. The design explored various possibilities and options to arrive at a functional and appropriate design. It has varying cross section for varying road widths and the interventions suited the local conditions. The Closed system adopted by HDBRTS, reserves the bus lane exclusively for the BRT buses. Implementation is a challenge as it involved built infrastructure of unique design, Land Acquisition, Rehabilitation and Environmental Impact Assessment. Managing the BRTS was a herculean task, as it involved various stakeholders and to look into aspects of providing service to people at affordable cost. Hence the need is to have capacity building to meet the challenges of designing, implementation and managing of BRTS efficiently, cost effective and timely completion of the project for operation.

Keywords

BRT System; Public Transport; Hubballi -Dharwad; Urban Mobility; HDBRTS.

Introduction

Hubballi – Dharwad, the twin cities of Karnataka are spread across an area of 203.3 Sq.km, forming the second-largest city in the state next to Bengaluru. Known as Chota Mumbai, Hubballi is the central business and manufacturing hub comprising of organizations like Infosys, Sandbox etc. Standing on the seven hills, Dharwad on the contrary, is well known for its rich culture as well as known for imparting quality education. It is an educational hub comprising of universities like Karnataka University (KUD), Karnataka State Law University, University of Agricultural Sciences IIT-D and IIIT-D. Nevertheless, these cities are interconnected and interdependent. As per 2011 Census, 9.4 lakh people reside in the twin cities and is expected to grow up to 15 lakh by 2031. These twin cities were in phase of their growth and expansion, hence an affordable, reliable and safe public transit network, would improve the connectivity, a foundation for future development. Amongst multiple options discussed, debated and analysed, Hubballi-Dharwad BRTS was the most suitable strategic intervention. It promised to ease existing traffic congestion, integrate existing infrastructure and to create opportunities for improvement in land use, to allow quick and inexpensive.

Conclusion

This study has investigated the Restructuring the public transportation of Hubballi Dharwad by BRTS. If public transportation is not well provided there will be an increased congestion, increased pollution and a high rate of carbon emission in the city, which drastically impacts the cities social and economic conditioning. The study helps to understand and design a better BRT System and Transit infrastructure. A strong support of BRTS in 2 Tier cities

could bring enormous benefits in the long run. Even though HDBRTS is not financially a profitable venture but in terms of sustainability and providing affordable service to the people it is highly successful. It needs funding and subsidy from the Government to keep operating and providing services. Maintenance cost of Transit infrastructure should be taken into account, while designing and implementing the project so that it does not become a burden to the system. HDBRTS has created a benchmark service providing reliable, dependable, safe and affordable travel to commuters. To implement the project of this magnitude requires a good leadership and political will. The system operation and maintenance is done by NWKRTC, a government entity and experienced in operating bus services since decades. Capacity building and training for officers and staff involved in implementing, maintenance and operating should be mandatory and monitored for better performance. Project requires support from people, institutions and media. People should own the project and use the service for their benefit. Also realize that BRT Trunk Corridor is not state highway but an urban road, which will have junctions and there will be speed delays. BRTS is a continuous system and not a project. There will be shortcomings and lacunae in the system and there is always scope to improve and upgrade.

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Research and application of climate-responsive design of traditional vernacular houses in Chaoshan, China

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Abstract

Chaoshan vernacular house is an important branch of Lingnan traditional houses in South China, with a long architectural history and an excellent climate responsiveness to the hot-humid climate. The modern rural houses learn the traditional experiences mainly in the form but fail to inherit the climate-responsive design and wisdoms of the traditional houses. This study took the widely distributed Xiashanhu houses in Chaoshan as the object, generated 128 Xishanhu parametric models by combinations of various parameters on design factors of building, opening, shading, construction, and street layout, and investigated the climate-responsive design techniques by using parametric methods. The results show that the hall width, room width, cornice height, orientation, and wall construction are the key climate-responsive design factors oriented towards thermal performance of Xiashanhu houses, and the optimized designs are: the smaller hall width (4.05m，4.32m，4.59m), the smaller room width (2.7m，2.97m，3.24m), the larger cornice height (4.92m，5.1m), the orientation ranged from 30° north by west to 30° north by east , and the brick and concrete wall. The rationality and validity were verified by applying the optimized climate-responsive designs to the re-construction of a new rural house and achieving siginficantly improved thermal performance by 5.18-9.98% compared to the original case. A detailed discussion was also provided on considering the actual situation and needs of the modern buildings in the process of "using the past for the present". This study is believed to provide valuable references for the research and modern applications of climate-responsive designs of traditional vernacular houses, and to contribute to the preservation of architectural and cultural regional characters and the inheritance of architectural climate responsiveness in contemporary times.

Keywords

Traditional vernacular house; Xiashanhu house; New rural house; Parametric methods; Climate-responsive design

Introduction

In the Chaoshan region in South China, many traditional vernacular houses are widely distributed, and many projects are underway on the reconstruction or new construction of rural houses dominated by residents or government. There is an urgent need to extract and apply the design strategies of traditional houses for contemporary projects, so as to preserve the architectural and cultural regional characters and inherit the excellent performances on architectural climate responsiveness. However, the related practices at present are mainly in the qualitative (imitating appearance and plan form or using materials and components) rather than quantitative way, and the key design factors and techniques for maintaining the architectural performances are still not fully revealed. Taking Xiashanhu houses, the most representative traditional vernacular houses in Chaoshan, as the object, this study aimed to investigate the climate-responsive design techniques of traditional houses, to apply the techniques to the new rural houses, and to verify the techniques' rationality and validity by following the climate-responsive design principle.

Conclusions

This study took Xiashanhu houses as the object and investigated their climate-responsive design factors in five aspects of building, opening, shading, construction, and street layout. Totally 128 Xishanhu parametric models were generated by combinations of various design parameters. Five key climate-responsive design factors were identified based on a-year-round thermal performance evaluation, and 76 optimized climate-responsive designs

were obtained by optimization. The optimized designs of Xiashanhu houses were applied to the re-construction of a new rural house to verify the rationality and validity. The main conclusions are as follows.

- To improve the thermal performance of Xiashanhu houses, the summer daytime is the time of concern, the incident solar radiation, opaque envelope radiation, and ventilation are the main paths, and the hall width, room width, cornice height, orientation, and wall construction are the key climate-responsive design factors.
- The optimized climate-responsive designs oriented towards thermal performance of Xiashanhu houses are: the smaller hall width (4.05m，4.32m，4.59m), the smaller room width (2.7m，2.97m，3.24m), the larger cornice height (4.92m，5.1m), the orientation ranged from 30° north by west to 30° north by east , and the brick and concrete wall.
- The rationality and validity of the optimized climate-responsive designs of Xiashanhu houses were verified by applying the optimized designs to the re-construction of a new rural house and achieving siginficantly improved thermal performance by 5.18-9.98% compared to the original case.
- The actual situation and needs of the modern buildings need to be fully considered and met to ensure the usability and effectiveness of "using the past for the present", and this study makes a detailed discussion on the case of Chaoshan houses.

This study is believed to provide valuable references for the research and modern applications of climate-responsive designs of traditional vernacular houses.

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Understanding Place Attachment Process Through Instagram Narratives and Imagery of Historic Urban Places

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Abstract

With the rapid urbanization and globalization of cities, sustaining place identity has become a significant challenge. Historic city centers encapsulate place identity that holds special memories and meaning for those who attached to those places. The conservation effort in most cases focuses on the physical transformation, which has undermined the importance of the psychological sense of place embedded in the people's attachment and memories captured in their minds. This paper explores the dynamics of human perception through understanding the place attachment concept and dimensions in the context of place imagery using Instagram as a new and highly used social media tool. Reviews of concepts related to destination image, place involvement, and collective memory provide a basis for linking the psychological process of developing place attachment to revitalized historic places. The paper establishes a theoretical model that incorporates a tool that captures destination imagery and narratives as a significant process in enhancing place attachment and meaning that could sustain place identity. By regarding the psychological dimension as an integral part of place identity, the meaning and memory of a place will be valued and relived in the revitalized centers.

Keywords

Place attachment; Historic city center; urban revitalization; Instagram

Introduction

A city's identity relies significantly on the stages of memorable past events, points of daily gatherings, and urban places that were once venues of collective memory. Such places are generally historic urban centers or buildings. These urban spaces nestle tangible and intangible collective memorable elements. Therefore, they are crucial in the formation of urban character and city identity.

Nevertheless, cities rapidly urbanized after World War II and the industrial revolution. They changed for better standards and in the name of improvement, but negative consequences also emerged, which had an impact on the social, physical, and cultural components of the cities. Urban centers shifted to new places while the old centers went through decay and abandonment. This not only resulted in physical deterioration but also safety issues. Most importantly, the main elements of the cities' identities commenced fading away. Modern cities are going through identity loss and weakening because of uniform planning strategies and rapid urbanization (Saleh, 1998). This results in placelessness (Relph, 1976). Local authorities, governments, and urban design practitioners have faced with the challenge of preserving the historical heritage sites to sustain the unique identity of place (Rypkema, 2003). Maintaining the character and meaning of place is essential since they are also fundamental elements of sense of place, community, and self-identity (Hull, Lam & Vigo, 1994). Place attachment dimensions can help to restore place identity in cities (Ujang, 2010). However, in restoring urban identity, urban design research mostly focused on the physical aspect of the place; rather than paying attention to the psychological dimension embedded in place attachment (Ujang, 2010).

Comprehensive historic city center revitalizations cannot be based only on physical enhancements, instead they

are challenging and complex processes that have to take cultural, social, economic, and historical elements into consideration. Sense of belonging and place attachment may help bridging these complex processes based on the understanding that attachment to place is an encompassing psychological concept that binds people and places. In the context of development, to have a sustainable conservation strategy in urban historic places, the concept of sense of place and place attachment should be applied (Martokosumo & Zulkaidi, 2015). In historically significant urban locations, place attachment ensures sense of belonging and continuity over time (Scanell & Gifford, 2010). This way, urban places that hold substantial elements of city identity can be conserved and revitalized simultaneously and stay alive as part of the users' daily lives. Preservation should be focusing on the sense of place and identity of the place, which is a major step in heritage studies (Yeung, 2013).

To prevent urban identity loss, significant historic city centers that have experienced decay should be rehabilitated by restoring the sense of place that could incorporate purpose and meaning in people's daily lives (Chu & Uebegang, 2002). The revitalization process requires both locals and visitors to perceive these centers as attractive and actively use them so that they can stay alive and also indirectly contribute to the residents' socio-economic well-being. Place attachment occurs stronger in attractive destinations, which leads to significantly higher national income (Dredge, 2010). Therefore, the visitors' place attachment towards historic city centers is especially important.

How a person perceives the outer environment depends on the information s/he gathers. In today's world, media tools provide most of the information about experiences and events outside an individual's immediate environment. People's perceptions are significantly influenced by the information they get from the media. Electronic media affects the way people perceive a place and its authenticity, and the way people form social bonds (Houghton, 2010). Due to the popularity of social media tools such as Instagram and Facebook in the last decade, almost everybody acts as an information source. There are more than 2.5 billion social media users as of 2018 (Statista, 2019) and Instagram is the fastest growing place-based social media tool. Social media usage is growing in the South East Asia Region by 34% each year (Kemp, 2017). Therefore, the amount of social media users in urban areas is significant (Duggan & Brenner, 2013). Instagram is a fast-grown social media network with one billion monthly users, and more than 500 million of them use the network daily (Clarke, 2019). Instagram is a more location-based; in other words, place-based social media application among other social media applications. Therefore, Instagram is the social media tool that will be the main interest of this study. Consequently, the shared information with the help of social media has an impact on other people. When it comes to places, ideas, and visuals about places that are shared via popular social media tools shape visitors' image of a place. Today, the impact of ever-evolving information and communication technology on place perspective is evident, but putting this into use in urban planning practices is still a debate (Dameria et al., 2018).

Memory can simply be put as people's ability to remember past experiences or revive their thoughts (Ardakani & Oloonabadi, 2011). An attraction point in an urban setting has an essential role in forming collective memory due to people's shared meaningful past experiences in that place. Sharing such meaningful memories with other people has become easy today due to the increasing usage of smart devices and hence, social media. By the use of these tools, an urban space's users and visitors, sometimes even individuals that have never actually visited that place, can interact and form a collective memory, a kind of place attachment for that place. The actual visitors of the place have the opportunity to show their emotional attachment via these social media instruments, at the same time, the audience forms an indirect emotion towards the place during this process.

The way people perceive a place and form place attachment has been transformed irreversibly due to the direct and indirect interaction between places and people via social media tools. These practices also changed the meaning and identity of places. However, there is limited research about the effects of popular social media tools in the urban context and specifically on place attachment about urban heritage sites even though there is a considerable amount of discussion for new technologies' impact on place (Dameria et al., 2018; van der Hoeven, 2019). There is a lack of knowledge about social media's effects on visitors' bonds to places, and in some cases, this led to the creation of less memorable and less meaningful places (Felasari et al., 2017). In that regard, the

link between Instagram usage, destination image, place involvement, collective memory, and place attachment to build better-developed revitalization approaches for historic city centers should be better understood. Such popular social media tools may attract more visitors and also may create better interaction between people and that place, resulting in a better embracing of the project, more income for the locals, and faster acceptance of rehabilitation projects.

Conclusion

New opportunities for interacting with places are emerging due to the increasing usage of digital social media, especially Instagram, which makes it compulsory to research the effects of such tools in the urban context. The proposed theoretical model is a step forward understanding the role of Instagram narratives in place attachment formation.

The conceptual model draws from the literature, and proposes a way to explain the causal interrelations between destination image, place experience, collective memory, and place attachment. Urban practitioners can utilize the model in the context of revitalized historic city centers to strengthen the identity of place and keep the city's identity alive. The proposed model should be explored further to investigate the in-depth relations between its components and their influence on the identity of the place.

The understanding and framework could be applicable to current heritage revitalization approaches that are focused on physical dimensions to move forward and incorporate the psychological process of place attachment. Furthermore, this model can enlighten how individuals perceive their environments in the new age of the Internet, which is very valuable for urban practice. Nevertheless, further studies are needed to fill out the proposed theoretical model.

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Design for deconstruction and reuse: towards a circular industrialized housing design

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Abstract

Construction, among other activities of human behavior, continues to have a big impact on our environment. It is therefore essential to re-think the construction process and create an effective "circular economy" by preparing a majority of building components and materials for reuse or recycling. A building's life-cycle and the possibility to reuse building components rather than recycle materials is a crucial aspect of "circularity" because recycling consumes more energy than component reuse. At the same time, the need for new housing calls for increased productivity and affordable, sustainable and cost-effective buildings. Industrialized housing has long been promoted as a solution to housing shortage. Nevertheless, industrialized construction has faced as many failures as enthusiastic responses over decades of development. The potential for reuse of building components in industrialized housing could increase substantially because of the reduced time required to design and build multiple units compared with traditional methods. There is a need, therefore, to study the feasibility of a circular industrialized-housing design method which, if assisted by currently available digital tools, could provide an implementable system. A literature review concerning reuse in construction, with a focus on industrialized housing units with timber-based structures, has been conducted and will lead to a qualitative interview-based study. As an initial result of the literature review, this paper identifies barriers and presents opportunities for building components' reuse in industrialized timber housing contributing to the circular economy and sustainable development.

Keywords

Design for reuse; building components reuse; industrialized housing; timber; circular economy; sustainable development

Introduction

The global condition of climate change is a consequence of human consumption of natural resources when the earth's resilience goes beyond the boundary of ability to sustain itself over the long term. The major impacts are degradation of eco-systems and severe conditions for human life (Persson, 2009). A large proportion of this consumption is linked to buildings and construction where one solution is to adapt the concept of sustainable development to the construction industry and to manage the construction process in sustainable ways (Jonasson et al, 2020). Defining sustainability for a construction project is a complex task. The term consists of many different and connected parts during the process, involving the client, project team members, other stakeholders, issues of aesthetics, functionality and material interactions. The construction industry is more responsible than other industries for global CO_2 emissions (UNEP, 2018). In 2014, the European Commission noted that circular economic systems were of immense benefit for sustainable development across Europe and encouraged member states to adopt them (COM, 2014). Subsequently, the United Nations Organisation framed the goals for sustainable development in its Agenda 2030, where goals 9, 11 and 12 mostly concern the construction industry. Construction, among other activities of human behavior, also generates a huge amount of waste (Iacovidou and Purnell, 2016). Construction alone could imply anything from a site-specific action to the creation of a whole society. Sustainability is about a holistic view, where "the whole is more than the sum of its parts", through relations between humans, society, nature, economy and technology development (Persson, 2009). Over the past decade, concerns about the impact of climate change on the built environment have increased. Zero-carbon performance has been highlighted, together with a shift from solely the performance of the product, i.e. the building, to the

construction process and a whole life-cycle perspective. These concerns have recently evolved to a focus on zero carbon, zero energy and, in the long run, to “retrieve what we lost” or “doing more good” by adopting a net-positive impact view that is defined as regenerative development (Cole, 2020). During the transformation to a zero-carbon, resilient, sustainable and regenerative society, buildings in most countries play a major part in the use of energy and the impact of carbon emissions. Globally, buildings consume about 35% of the total available energy, responsible for roughly 38% of total carbon emissions, and generate about 36-40% of all man-made waste (UNEP 2020).

The adoption of strategies for material efficiency, promoting circular economy concepts using life-cycle approaches in design, construction and end of life by re-using construction components or materials, is among the most critical of actions to achieve a sustainable built environment as stated in the latest Global Status Report for buildings and construction (UNEP, 2020). Furthermore, in order to meet the multiple criteria of sustainability, industrialized construction could be a part of the solution that also contributes to solving the housing shortage. A benefit of off-site construction is the production of decent quality, affordable housing that can be rapidly assembled on-site. Prefabrication can improve environmental performance considering that the building is designed to be reused (Aye et al., 2012). Industrialized housing construction (IHC) consists of different approaches (i.e. prefabrication, modularization, off-site fabrication, or modern methods of construction) (Kedir and Hall, 2021). The possibility to build parts of the structural frame as planar structural modules (walls, floors, etc.) contributes to a reduction in construction time. Moreover, the reuse potential of prefabricated timber-based structures is claimed to be at least 69% (Aye et al., 2012). The global consumption of natural resources by the construction industry is not sustainable. It is, therefore, essential to re-think the construction process in terms of the efficient utilization of natural resources, their reuse and the recycling of demolition waste, as a minimum. Construction professionals, including practicing architects, engineers and construction managers, as well as environmentalists, researchers and academics should be called upon to play a major role in helping to sustain our environment (Khatib, 2016). Hence, due to an increasing urban population and the need for affordable housing, our study focuses on the reuse of building components. This paper aims to identify enablers and challenges for the reuse of building components’ in industrialized housing with a focus on timber-based construction.

Conclusions

Most political decisions and legislation focus on waste management when trying to solve sustainability in construction. This is agreeable since the amount of waste generated is a significant concern and the availability of landfill is increasingly scarce. However, attention should be directed to the design phase, which is the most influential stage in the delivery of decent, affordable housing, where change is necessary to ensure circularity is achieved. Once design is able to introduce building components, elements and materials with features that support reuse practices, a major contribution to solving the problem of waste will have been found.

Resource efficiency in housing construction should be able to fill the gap between housing demand and current construction methods. Furthermore, the demolition phase of the construction process has to be better analyzed and improved to reduce the amount of CDW and, consequently, the carbon footprint of the construction industry. Reuse of building components is a recommended practice from a circularity perspective. It seems necessary, therefore, to reintroduce building components in the supply chain, replacing the perception of a waste problem with an opportunity to make the construction industry more sustainable and resourceful. ITH has much to offer as a solution to housing shortages and has less environmental impact than traditional construction, which could be reduced even more through the reuse of building components. Unfortunately, a lack of quantitative and qualitative data about the benefits of reuse in construction hinders the spread of this practice. With this in mind, it is evident that reuse of building components needs to be adopted on a large scale and embraced by all stakeholders in a project. It is crucial to change attitudes towards reuse in construction and to establish a broader involvement and stronger collaboration between all the stakeholders responsible for the different phases of the construction process, starting with planning and design, and continuing with manufacture, construction, handover and maintenance to the point of refurbishment or deconstruction for reuse from a holistic perspective. Furthermore, quantitative and qualitative

studies on the reuse of building components in ITH will be conducted to explore the field by analyzing multiple cases. This study will further explore the barriers to, and enablers of, reuse in ITH from the perspectives of clients, building contractors, designers and demolition contractors.

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Future study of regional spatial structure in Iran (Horizon 2040)

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Abstract

Iran's spatial structure indicates the existence of imbalances in the territory. The message of imbalance is socio-economic and spatial inefficiency that has led to polar development. However, internal imbalances in the spatial structure of different regions mostly indicate the effect of economic and social behaviors on the formation of the spatial structure of the country. Nowadays, understanding the structure governing the space system has forced researchers to use quantitative and qualitative models and methods to determine the regularity and its application to space. Scenario-based planning is one of these methods that will be used in the future of long-term research. This research is considered as applied in terms of purpose and descriptive-analytical in terms of research method. The proposed scenarios are exploratory in terms of a model. The key factors required for the research were extracted from field and documentary studies to be provided to experts. The non-probability sampling method of available type was used to select experts. Interaction matrices were used for scoring and Mick Mac software was used for data analysis. Findings showed that political and spatial concentration of power, management and planning focus, top-down planning are the three key factors influencing. The status of the scenarios also showed that the first scenario of Iran's spatial structure is the most desirable. In the second scenario, the desired states are superior to the static and critical states. In the third scenario, the effective factors are in the middle ground. Finally, in the fourth scenario, which is opposite to the first scenario, unfavorable situations are superior to intermediate and desirable situations. Despite efforts to lay the groundwork for the first scenario, the results show that it has not been successful to date.

Keywords

Spatial structure, Futurology, Regional imbalances, Scenario planning, Iran.

1. Introduction

Foresight is the presentation of wise propositions about the future and the interpretation of these propositions in a way that facilitates conscious action in the present and the processes of collective learning and meeting the challenges of the future. For a country that has not outlined a vision for its future, no situation seems appropriate and no situation seems inappropriate. Today, futures studies are one of the competitive advantages along with natural advantages, because of the ability and willingness of decision-makers and managers to adopt a long-term vision of different needs and facilities, both at the national and national levels. The micro and enterprise level is a competitive and futuristic advantage (Mardukhi, 2017). An examination of the existing literature on the Iranian planning system shows that in the period of development plans, investment priority was given to areas where there was potential for development. In other words, the cost-benefit law of economics in these programs indicated the priority of development and investment. The temporal and spatial conditions and the results of the first and second development plans also required that in the third plan, the growth pole approach be used for economic development and the establishment of the foundations of development in the country. The hierarchies of the poles formed a hierarchical spatial organization in Iran. According to the law of development based on the pole of growth, inequality initially increases, and in the long run, with the inflow of capital into the margins, inequality declines. Therefore, the growth pole had two consequences. The first consequence of this approach was the emergence of economic poles and subsequently the emergence of population poles. The second consequence also required time to determine the influence of capital flows to the margins, which was practically disrupted by the formation of the revolution. After the revolution, development programs called social-economic development programs began their process. But in practice, no fundamental changes were made to the development plans. Centralism, lack of investment in the suburbs, lack of power adjustment, grammatical planning, and top-down in addition to disrupting the process of development programs, added many other problems. In a way that after four decades, not only has the spatial balance in Iran not improved, but it has also

worsened. Therefore, to take the right steps in the continuation of the path, it is necessary to identify and analyze the country's space organization, especially urban space. Because the analysis of how the country's space organization causes the organization of space and guided development in the country. Strengths and weaknesses of the country's spatial structure are identified and planned based on improving strengths and resolving weaknesses. As a result, it can identify the trend of spatial developments in the country and direct its development based on spatial justice, territorial justice, and social justice, and economic development. Therefore, this study aims to determine the scenarios of Iran's spatial structure, which is also the result of urban spatial structure, in the long run, based on the planning process.

Conclusion

The concentration of political, administrative, economic, and social activities in some of the top poles of the country, especially Tehran, is an undeniable fact that the issues and problems arising from such a focus are not hidden from anyone and if the current growth rate continues, huge problems in the coming years. It will cause major disruptions. A clear consequence of this trend is the random distribution of opportunities and facilities and resources across the territory and the intensification of regional and local inequalities, which is intensifying due to investments made and the creation of infrastructure in the past. Is. Now, with all these descriptions, a fundamental step must be taken to reduce and prevent the increase of such inequalities in the spatial and regional structure of the country, and while recognizing this structure correctly and completely, to present viable strategies with capable management as well as efficient supervision. Step by step and based on the plan and principles program that is based on a complete knowledge of all spatial-aesthetic dimensions of the country, it can be hoped that in the future people across our country will enjoy the desired and equal welfare and in that situation their energy on further development and Better to focus on global standards. In this regard, the use of scenario writing is considered as an effective and efficient method for futurism. Developing future development scenarios makes it possible to deal with the complexities of relationships. The future of the regional spatial structure in Iran based on the situation of the key factors of the presented scenarios can be explained in four situations: ideal, good, the continuation of the current trend, and bad. This shows that the future of Iran's regional spatial structure is predictable. This process is related to the type of attitude towards planning to draw it. Achieving the best and most balanced regional spatial structure requires consideration and awareness of uncertainties and more effective use of key factors. The consequence of such a process is the spatial structure of balanced regions in the territory of Iran. The key factors of this research are considered as tools for mapping the future, the type of approach to each of which will affect the future of the regional spatial structure in Iran. The focus of management and planning is the only key factor with more impact and less impact indicates the importance of this factor. Eleven key factors are in a state of instability that is very sensitive to system behavior. A noteworthy point among the key factors of having resources in Iran in the fourth region or key factors can be eliminated. This indicates that the planning of the regional spatial structure in Iran has nothing to do with having resources, which has excluded even experts from considering this factor as an influential factor. In other words, the planning system of the regional spatial structure in Iran must be considered through other factors. The presented scenarios of the future of the regional space system in Iran show the type of dealing with key factors. To achieve the most favorable scenario, none of the key effective factors should be in the middle or static position. If the key factors are superior to static and critical situations, we can see a favorable scenario. If the approach to key factors is intermediate, the current trend of imbalance in the regional spatial structure will continue. Unless there is a proper response to the key effective factors, unfavorable situations will prevail over intermediate and desirable situations of key factors.

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Pre Preserving the margins: pre-colonial cultures in peripheral areas of a city in the Andes, an example to learn from.

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Abstract

Cities in the Andes are characterized by their conflicts between orthogonal grid colonial urban designs, faced with complex topographies and natural habitats. This was also the case for Quito, the capital of Ecuador, where ravines where filled in or contaminated and water systems ignored in order to reach a preconceived concept of what a city 'should' look like. Furthermore, the influx of colonial settlers into the newly founded city began to push out the indigenous communities who had previously settled there, which is a process that continued with the consolidation of the modern city. Nowadays, the bastions of these communities are only to be found in the peripheral, marginal areas of the city and natural surroundings.

This article is based on a case study of such an urban community: La Comuna de Santa Clara de San Millán. The research set out to understand the local rhythms and way of living in the Comuna, as well as how the members of the community perceive and co-exist with the natural habitat. First the context of La Comuna was studied through historical data and by mapping the local topography, demography, hydrology, urban structures and land uses, amongst others. The understanding of the community was then deepened through qualitative primary research that consisted mainly of Participant and non-Participant Observation, plus Semi-Structured interviews with members of the Comuna.

Overall, the findings show that the case study highlights a need to rethink the way we conceive sustainable urban design. Since the colonial times in Latin America there has been a tendency to think about urban planning and not how a city relates with nature. The ancestral knowledge that is preserved in La Comuna is of a different perspective: the urban areas where we live are part of nature and have to be thought of as such.

Keywords

Sustainable Urban Design; Andean cities; Urban Communities; Andean Metropolis

Introduction

Andean cities of colonial origin due to the conquest tend to be replicated by adopting and importing Eurocentricmmodels and landscapes as ideals, being indifferent to local topographic characteristics, landscape and environmental systems (Di Campli, 2016). Ever snce the conquest of the first Andean cities, the orthogonal grid model was adopted, which is described as geometric and easily replicable, but denies the environmrntal and natural landscape of the area (Di Campli, 2016). In this context, the town of San Francisco de Quito was founded in 1534 on 56 hectares of almost flat land, but which was criss-crossed by several ravines. Over the subsequent years the ravines have been disappearing through landfills to make way for construction projects. An example of this would be the Manosalvas ravine that originally crossed the center of the historic center (Peyronnie & de Maximy, 2002). In this way, the existence of a denial of the predominant topographic characteristics is confirmed, as pointed out by Di Campli (2016). The ravines and the relief are part of the relevant topographic characteristics of the city, in fact during the conquest the relief was a determining factor since it protected this settlement from enemies and from weather conditions. Among the elements that make up the relief of Quito, the

Pichincha volcano stands out, whose morphology was one of the characteristics that determined the initial establishment of the city due to the curvature that is present in the center of it (Peyronnie & de Maximy, 2002).

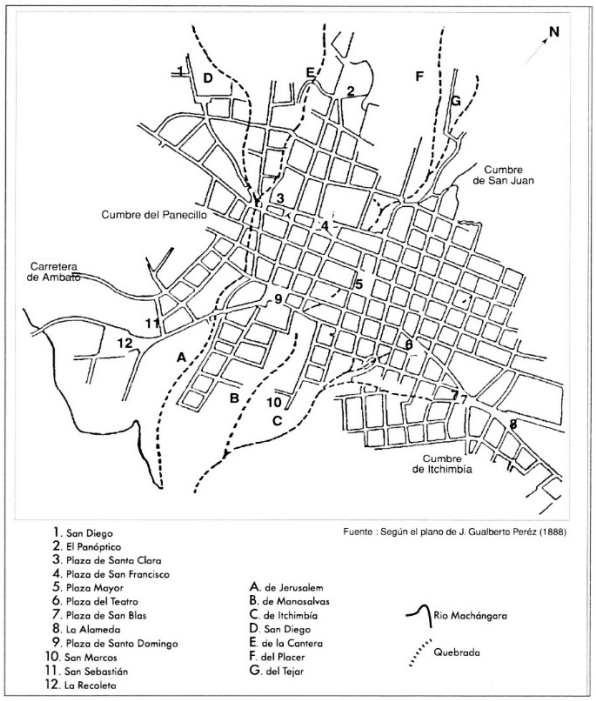

Figure 1: Quito at the end of the 19th century
Source: According to the plan of Gualberto Pérez, 1888
Excerpted from: Peyronnie and Maximy, 2002

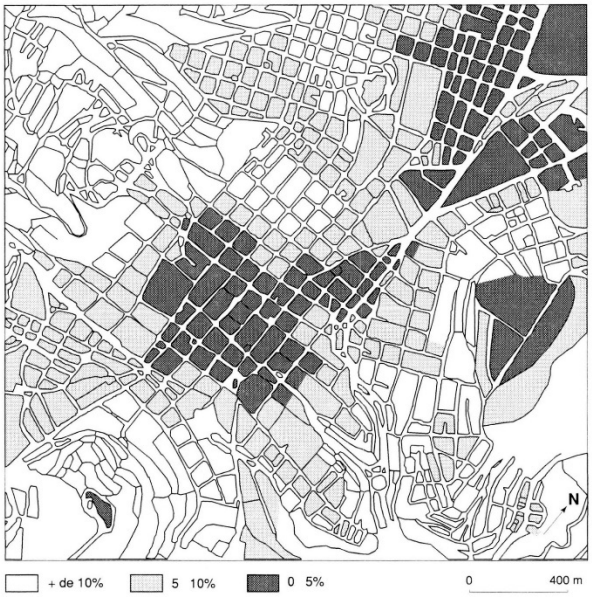

Figure 2: The center and slopes
Excerpted from: Peyronnie and Maximy, 2002

The Andean city was made up of simple coremas, which are graphic elements that show in a simple way the forms of occupation of the territory and transformation of space. These were: aureolar, orbital and center - periphery (Deler, 1992). Under these territorial models, domination and segregation is accentuated, so that faced with the need for accommodation for indigenous and people if a mixed race who worked providing their services and as labor, the first suburbs of Quito were developed. These were located on land near the center, but difficult to access and with steep slopes, or beyond the ravines in the southern area of what was then the city, or next to the roads in the direction of nearby farms (Peyronnie & de Maximy, 2002). Quito continued to grow and transform itself into a metropolitan space based on two logic bases: the expansion of popular residential peripheries and socio-spatial segregation (Deler, 1992). In this way, the Andean city becomes a more complex andean metropolis and with coremes of this new scale, until it adapts to the definition of a contemporary metropolis by Díaz (2013). Diaz points out that metropolises are no longer traditional structures related to center-periphery models, but are complex urban structures product of the integration of fragments that were the result of previous urban processes, Diaz adds that metropolises are are no longer traditional structures related to center-periphery models, but are complex urban structures that integrate fragments of previous urban processes, continuing until finally meeting nature herself.

Quito from its foundation to the present has experienced several models of urban growth: concentric, longitudinal and dispersed. The concentric urban growth occurred from 1748 to 1904 (Carrión & Erazo, 2012); This model is characterized by the grouping of religious, economic and administrative services in the historic center, plus the neighborhoods that constitute the cells of the city and reproduce its model on a smaller scale (Echeverría, 2017). The longitudinal model is in force from 1950 to 1990, and is attributed to a modern city made up of industrial zones, residential areas driven by the real estate market and the change in land use from agricultural to residential (Carrión & Erazo, 2012) due to a significant migration from the countryside to the city (Echeverría, 2017). The dispersed model is attributed from 1990 to the present; This model is the result of having

pushed linear development to the limit, whose traffic and pollution problems drive the population in search of healthier environments close to nature. Gradually, the change in land use intensifies from agricultural or forest to urbanized land, and subsequently the areas of ecological protection become affected (Echeverría, 2017).

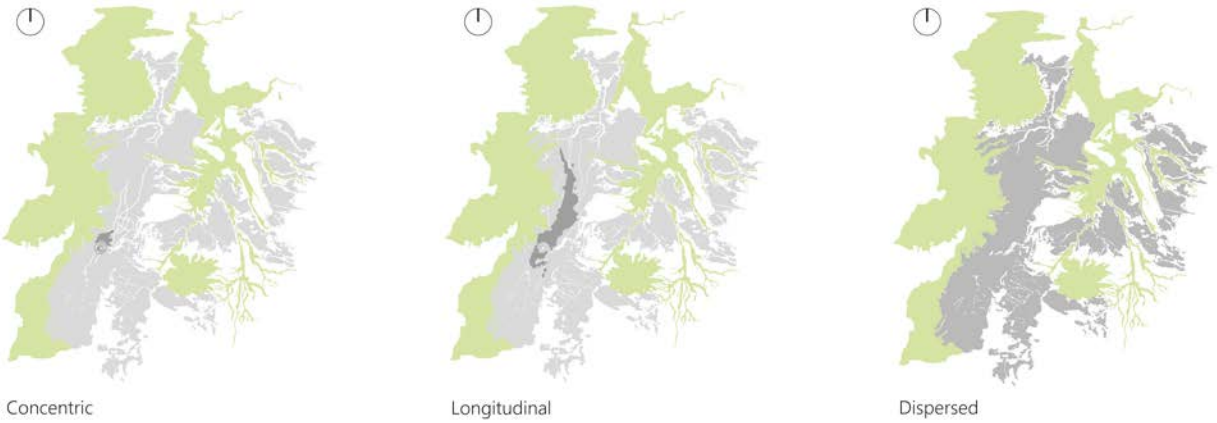

Figure 3: The urban area of Quito and the ecological protection areas
Source: Municipio del Distrito Metropolitano de Quito, 2015
Prepared by: The Author

The historical growth process that Quito has experienced since its foundation takes it to a decisive point in which the surrounding valleys are urbanized and the loss of fertile soil suitable for crops is added to the degradation of the forest and ravines on which the city sits, perpetuating the denial of geographical characteristics by the adoption of imported territorial models that took place centuries ago in what is now the historic center.

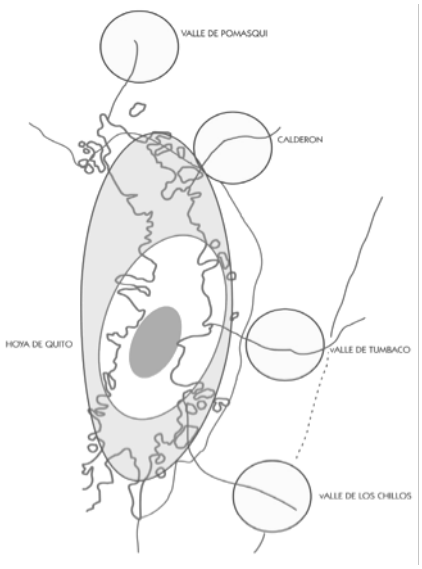

Figure 4: Scheme of the form of territorial organization of the metropolitan area
Source: Carrión and Erazo, 2012
Extracted from: Carrión and Erazo, 2012, p. 517

Figure 5: Contemporary urban area of Quito
Source: Municipio de Quito, 2015
Prepared by: The Author

Currently the town of San Francisco de Quito has been transformed into the Metropolitan District of Quito. Where, in the last ten years, 395 hectares of ecological protection have been lost due to the expansion of the urban border, 10,754 hectares of vegetal cover - forest and natural and intervened areas; and 6,413 hectares of cultivated areas have expanded into ecological protection areas (Municipio del Distrito Metropolitano de Quito, 2015). The main cause is the expansion model of Quito, which according to the Municipality of Quito (Municipio del Distrito Metropolitano de Quito, 2015) translates into the loss of protected natural areas.

The urban area of Quito is mainly surrounded by areas of ecological protection such as forests and ravines (Municipio del Distrito Metropolitano de Quito, 2015). Currently, the urban area has come into direct contact with the ecological protection areas, causing of the environment and landscape (Allen, 2003) plus increasing the vulnerability of the sectors close to them (Secretaría de Ambiente, 2012). In the case of the ravines that represent a limit and create breaks in the continuity of the terrain, the urbanization of them is the result of a complex intervention, since it usually implies the filling of the ravine. In the protected area of Pichincha - Atacazo, the forest and grasslands do not represent a geographical limit, so the occupation of these areas implies the clearing of the forest and a subsequent change of land use from forest to urban. Their occupation is less expensive than that of the ravines, so these areas are more vulnerable to informal urbanization processes. The topographic determining factor that accompanies this protected area is the predominant slope of the Pichincha volcano, which has become prone to erosion due to the degradation of its vegetation cover, and as a result these two factors together the risk of landslides is increased (Ávila, Larco, & Scholz, 2014).

Although the expansion of the urban area towards the east and the valleys is predominant, Quito also expands towards the slopes of the Pichincha volcano located to the west. This is despite its complex topography and exposure to volcanic hazards, mass movements, water erosion and mud flows. This growth process is attributed to informal housing invasions, such as can be found in the areas of Atucucho, La Roldós and Pisulí, and the real estate interest that promoted construction outside the area established as the urban edge (Barrera, 2013). This expansion has occurred despite the fact that in 1983 this area was declared as a forest and vegetation area that acted as a protective barrier around the city of Quito. By the 90s the slopes were either legally occupied or incurred into by informal housing invasions, with an annual growth rate of 17.5% (Secretaría de Ambiente, 2012). Consequently, in the year 2012 the slopes of Pichincha - Atacazo were declared as natural and landscape heritage (Secretaría de Ambiente, 2012). To regulate the occupation of these slopes, the municipality carried out several interventions, such as environmental sanitation plans and, the most recent, the determination of the buildable urban limit, together with the proposal of the park system on the slopes of Pichincha - Atacazo and the declaration of this area as a Special Intervention and Recovery Area in 2011, which had its respective strategic plan published in 2012. The Areas of Special Intervention and Recovery are defined as public, private or community areas that, given their biophysical and socioeconomic conditions, prevent natural catastrophes. Their function is to reduce the pressure towards conservation areas; the consequence of the occupation of these areas is negative because the environmental system is unbalanced, causing negative effects in the urban area, such as landslides and alluvium flows (Secretaría de Ambiente, 2012).

In 2017, the Municipality of Quito, through the Secretary of Territory, habitat and Housing, carried out a review of the urban limit and the limit of the Pichincha-Atacazo Special Intervention and Recovery Area. 21 polygons were identified (STHV, 2017) where the urban area continues to expand towards the ecological protection area. The vast majority of these expansion processes have developed through informal settlements. However, the case of La Comuna Santa Clara de San Millán stands out, where the occupation of the territory near the urban limit is not the result of invasions but of a complex phenomenon product of pressure and socio-spatial segregation towards original indigenous settlements. This research set out to understand the territorial process of a historical nature that differentiates “La Comuna” from the other territories located along the urban limit of Quito, as well as the local rhythms of its inhabitants, their way of life and their perception and coexistence with nature.

Conclusions

It is concluded that La Comuna de Santa Clara de San Millán houses in its territory characteristics of urban design developed through the empirical knowledge of its inhabitants, but that resonate characteristics that today are applied in sustainable urban design. This refers to the design of its urban structure which is relevant to the topography and has generated a layout of pedestrianised streets, with paths that interconnect roads through “chaquiñanes” that are exclusively pedestrian and with 5 minute travel distances between them. To this is added the conception of urban design in sloping areas based on strips. Together these strategies are related to the street

pacification models developed in recent years. To this fact is added the conservation and care of natural elements such as ravines and and water sources, because their importance and the serious consequences that their deterioration could cause is recognized (despite the fact that this behavior has not yet been replicated regarding the forest). The study of La Comuna allowed us to identify a fragment of territory that allows us to imagine what Quito would be like if the local landscape had not been denied. We can also identify guidelines related to sustainable mobility, plus food security that is possible by having crops close to the houses, plus the importance of the maintenance and recovery of green infrastructure. Above all, we are encouraged to take a fresh look at the vestiges of pre-colonial cultures that have much to teach us, and from which we have much to learn. In the case of La Comuna, the relationship with landscape and nature stands out and puts forward the stark and seemingly obvious, straightforward proposal that urban development should not deny the components of the landscape that receives it.

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Public Parks for Post Pandemic Landscape Architecture

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Abstract

In recent years the design of green areas of public parks has been one of the important areas of particular interest for landscape designers and planners. Unfortunately, most of the existing public parks here in Egypt often have real difficulties in attracting attention from the government policymakers or the private investors. However, nobody can deny their significant role in promoting community ties and reducing regional crimes. These roles exist under the umbrella of social inclusion, one of the main terms of pursuing ecological balance.

The main concern of this paper is to discuss the importance of public parks for the community's ecological nature, inhabitants' health quality, and well-being, especially after the Corona virus pandemic. The applying analytical methodology offers an investigative approach to the study to promote logical findings that can help governors and policymakers to get the utmost of public parks benefits. And providing a smooth access for the community residents

Keywords

Public Parks; Quality of Life; Human well-being; Community Services and interactions.

Introduction

Public spaces, public areas, or the common name public parks are not leisure; they are essentials. They provide community inhabitants with spaces to recreate, interact, and connect; furthermore, they are spaces to escape from the hustle and bustle of daily city life to recharge again for next adventures or challenges for new works duties and commitments.

During the Corona virus pandemic, we have touched upon the gigantic importance of the public parks and the outdoor areas, in general. Now, most individuals know exactly how to weigh the dangers of not respecting social distancing, and the benefits of natural ventilation besides being outside buildings most of the time. By June 2020, when cafes and restaurants reopened, they encouraged their customers to stay outdoors instead of being indoors. Even the cafes which lacked outdoor areas created them. Figure (1). Seemingly, people started to readjust what architecture did not offer.

Meanwhile, in trying to draw an outline to tackle this circumstance or status quo many conferences and webinars have flooded the internet in the architecture field, discussing the tenet of increasing outdoor areas and pedestrians. In Egypt we are devastating what we already have; a huge sabotage has occurred in so many public parks and open spaces.

In this paper, a concern will be discussed about how public parks can influence our society, and what we are supposed to deal with in upcoming years to face this pandemic, and to enable our architecture to serve citizens well.

Figure (1). Cafes recreated outdoor areas during Corona virus pandemic.

5. Conclusion

Public parks are significant assets in terms of recreational spaces and human activities. They are much considered as the central of every community. Simply, they provide many chances for spending leisue times in so many diffirent aspects. From exercising to hanging out with friends and from spending quality time with your family to watching out your children.

Many recent research have been proved with quite various quantitive or qualitative evidence that connecting with nature helps a lot to relief stress. In addition to improve human overall wellbeig, mentally, physically, and emotionally which people would might need during the corona virus pandemic.

However, meeting the challenging towards keep these beautiful green spaces accessible for every resident anytime is hard in our developing countries.

Throughout this study inquiries, we can draw a framework for upcomming research to descover how we can meet public parks requirements for livable and sustainable community.

6. Recommendations and Discussion

Public parks in Egypt are facing several problems, most of them are related to economy and financial reasons. Despite the hard work of the local authorities, we still need a hand in helping these spots to host many Egyptians with their families and children. Public parks play a crucial role to prevent crimes and enhance social coherence between residents and they were as a relief valve during the corona virus tough period.

For further researcher, highly recommendend for architects, landscape designers, and urban planners to focus more on post pandemic landscape architecture to promote public parks.

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THE NATURE SMART CITY II – Defining the Next Urban Vision

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"The Earth is not a platform for human life. It's a living being. We're not on it but part of it. Its health is our health." -Thomas Moore

ABSTRACT

In the era of digitalization, we have increasingly moved from real-life experiences towards virtual experiences. Consequently, we have lost our inherent connection to nature and our natural ability to understand the natural world around us. The human-nature connection has lost its meaning in urban life. There is a real need to find a new vision for the post-pandemic city that is different than the pre-pandemic city: we are moving from the tech-driven smart city to *Nature Smart Cities* with an emphasis on human connection and nature connection.

Howard Gardner, who created the theory of multiple intelligences, later on added to his list *naturalistic intelligence* or *nature smart*. This particular form of intelligence manifests itself in an individual's sensitivity to nature and the world. People endowed with this form of intelligence are the people who see both the forest and the trees. Restoring and rebuilding our interdependence with environmental systems is the very essence of human and planetary wellbeing. *How to define the city and its spaces for happiness, doing and living well, in harmony with humans and nature?* This is my second article on the topic.[2]

Keywords: *Architecture, Urban Planning, Nature Smart City, Eco Smart City, Biophilic City, Biophilic Architecture, Biophilic Design, Blue & Green Spaces*

1. INTRODUCTION: Fifty Years Later

"I believe that I do not really teach architecture, but that I teach myself." – Louis I. Kahn

My father is an emeritus professor of architecture, currently 90+ years old. Recently, I found some papers that he gave me a long time ago, before I was about to begin my studies in another Finnish school of architecture. The bottom-most paper in the box happened to be his teaching curriculum for first-year architecture studies. Top of the list in the fall semester there were the topics: Spiritual Needs, Work, Exercising the Body, Living Well, Nature, Neighbourhood and Milieu. The program was planned for the fall of 1972. Those were early days for Environmental Psychology, a topic that my father brought into the curriculum of architecture, a first in Finland. Already 50 years ago, he talked about the architectural

quintessence of human life and wellbeing related to creating, designing, building, and planning the built environment.

And there I was, almost 50 years later, sitting and writing about the very same topics without knowing or remembering my father's list. My themes were: Personal Wellbeing, Human Health, Human-Nature Connection, Community Spirit, and Planetary Boundaries. Was it a coincidence? – Or could the approach result from decades of interaction with my kin? I was wondering who would be next to write about these themes 50 years from now, in the 2070's? Perhaps someone who had listened to me and become inspired by the topics that I have tried to explain, and then developed them further through their experiences. Or perhaps it will be a person sitting under the very same mother tree and getting the wisdom and knowledge from there, like an ancient storyteller sharing an everlasting epic.

I remember reading in my early years in architecture about Louis I. Kahn's idea of the origin of the school. There was a drawing of a big tree with people sitting under it in the shadow. The text stated: "Schools began with a man under a tree, who did not know he was a teacher, discussing his realization with a few, who did not know they were students." (Louis I. Kahn)

In my mind, this story told by Kahn is the origin of the human version of a *Mother Tree* or a *Hub Tree*. Professor Suzanne Simard, who created the ground-breaking and radical theory of the complex interdependent relationships in forests among the trees, has recently published a book about the essence and importance of mother trees for forest wellbeing. Her research centers on the relationships between plants, microbes, soil,

carbon, nutrients and water that underlie the adaptability of ecosystems, especially the below-ground fungal networks that connect trees and facilitate interplant communication and support.[3]

Mother trees can recognize her kin and intentionally transfer carbon to her kin seedlings to favor them. That's a behavior that has got intention and consequences, and there's decision-making going on there…There's a choice. And we could deconstruct that to physics or something like that, but when we were starting to discover that she recognized her kin and could send more resources, I thought that's wisdom, because there's intention there. There's a sentience.[4]

In our cultural ecosystem, a Mother Tree is someone who has extensive knowledge and original wisdom, and who is willing to share that insight and understanding with others. To be a Hub Tree is a passion, not a role. It is to encourage each and everyone by coexisting and co-envisioning with others through helping them to flourish and thrive in what they are doing. A Mother Tree is supportive of others through her encouraging, doing, networking, speaking, writing, and reading. The best Mother Trees don't consider themselves teachers, rather they are lifetime students. They pass the knowledge that they have acquired during their lifetime in doing, learning, and experiencing. Their appetite and openness for new things and topics are endless. They explore and experiment, since they are excited about a vast number of things. Yet at the same time, they know where they are heading.

They have a lifelong mission and vision to follow. You are lucky if you have met some of these Mother Trees during your lifetime.

However, not every tall tree is a Mother Tree. According to the story, the young Constantin Brancusi left the atelier of great Auguste Rodin after serving only a few months as an assistant by saying: "Nothing grows well in the shade of a big tree". A true Hub Tree can be recognized based on the person's integrity, humility, compassion and kindness. A Mother Tree has strong roots and a tall trunk, sharing facts with a vision. The origin of a Mother Tree or a Hub Tree is a genuine understanding and respect for being a human in the service of others. The best forest is a diverse one, including both tall trees and seedlings and everything in between.

If you have a structured forest where you've got small ones, and big ones helping out the small ones, and mid-canopy trees, and different species, they're occupying all the niches in that forest, that diverse forest, and so that's actually a much healthier forest, is to have that kind of diversity.[5]

It took me a long time to understand that it is not enough to try my best, both at work and in life. We all need Mother Trees, people who support us and give us a second chance by believing in us more than we do ourselves. These people carry on living, generation after generation, as a living legacy of their wisdom and generosity for others. That is why they are the tallest trees in the forest. *A Hub Tree is a teacher of teachers.* Growing among and under Mother Trees and filtering their wisdom from generations of doing and living well with nature is the flow of life telling us that life itself is a constantly evolving force, it is:

A LIVING IDEA

***

Life is an endless unfolding, and if we wish it to be, an endless process of self-discovery, an endless and unpredictable dialogue between our own potentialities and the life situations in which we find ourselves. By potentialities I mean not just intellectual gifts but the full range of one's capacities for learning, sensing, wondering, understanding, loving and aspiring.[6] -John W. Gardner

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ISTANBUL ; THE ECOLOGY, NATURE AND DISASTERS; DESIGNING FUTURE CITY WITH INNOVATIVE HOUSING PROJECTS

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Abstract

This research is involved to designing future of Istanbul city with the new perspective of the changing dynamics in urban planning and architectural design. Istanbul city wittnessed the migration phenomenon long years, which has seen major factor in the uncontrolled development of the city from the mid 20th century. But, recently the city has been evolved into a completely different planning path by changing planning priorities in housing plannings with the natural, ecological, eartquakes, recent environmental disaster and pandemic.

The housing problem of Istanbul city as a metropolis, became problemeatic with massive internal migrations since the 1970s, and began to threate development of the city. By the 2000s, howver, the experienced disasters were became significant for city's future planning. The earthquake in 1999, and large-scale environmental disaster emerged as marine pollution surrounding sea of the city in the 2021, and the recent pandemic led to total change in the housing planning approach and housing models.

After the these environmental disasters, two major planning issues came to the fore in the city; first is gentrification applications just after the earthquake, the second is green urbanism plannings, which started after the 2010s and recent pandemic which later gained momentum. The green architecture in the housing plannings, were developed towards the out of the city with new housing models. The methodogy was specified for this research examining the new and innovative housing planning in recent years in the framework of agenda 21. Istanbul city and housing models were used as a case study. Although there were some researches on innovative planning studies, but the city of Istanbul was seen as a first as a subject in the context of research.

Keywords *Istanbul, Disasters, Ecology, Future Planning, Green Planning, Housing*

Introduction

This article is presents a research about the problems experienced in the city and housing projects planned accordingly after the disasters such as; natural, ecological, environmental, earthquake disasters and recent pandemic. It also includes on housing planning method and models and construction institutions practices, applications as well as the todays innovative housing production methods.

Late years, Istanbul became a very problematic city with the disasters it has experienced one after. As well as the necessity of the implementation of a different planning policy than the any other cities, and besides all these problems, the problem of the implementations of the innovative projects in the context of the Agenda 21 was emerged as another problem. Also, Istanbul was seen as one of the leading mega-cities in the world, with a significant population of 15 million according to World Bank.

The city went through significant planning periods at the beginning of the 20th century, from 1935 to the 1960s and was planned by prominent planning actors such as French architect-planner Henri Prost and Italian architect-planner Luigi Piccinato. But, later the city entered more problematic period with the uncontrolled planning implementations of Democrat Party in the 1960s, the increasing of inner mass migration problem and liberal policies of the 1980s which led to accelaration of illegal houses.

An innovative planning approaches are needed to find solutions to the problems in the city which developed having many problems, especially the recent disasters. So, the city gradually started to developed some innovative projects in its agenda, especially implemented after the 2000s.

After the 1999, with the earthquake, the planning priority of the city had to gathered two main planning purposes; green and innovative plans for the future planning which was accelerated by recent pandemic, and the gentrification studies which were initiated after the eathquake.

Another problem is to follow the world agenda and to produce solutions to the problems of the Istanbul city by implementing innovative projects in the world. Thus, the countries of the world first gathered in 1992, in "the Earth Summit" in the Rio Janeiro city, Brasil to find solutions to the problems of the cities today, also one of these series of meetings was held in Istanbul in 1996, related to Agenda 21. In the contex of the innovative city plannings Istanbul's eastern and western axis, K. Çekmece and Kartal Regions opened to a new planning competition, in the 2010. Leading architects in the world were produced some solutions with their projects; with eco-city project Ken Yeang, and the others Rem Koolhaas, MRVD, in K. Çekmece region and Zaha Hadid Architects prepared Kartal Region Master plan as a macro-scale gentrification planning.

Just after the 1999 earthquake, realizing of some gentrification studies were emerged as an immediate necessity of city's agenda and the renewal of not earthquake-resistant residences initiated. Thus, related to gentrification projects some districts specified as priority places in the Istanbul city such as; Kadıköy, Göztepe, Nişantaşı, Suadiye, Bostancı, Kartal, etc.

Furthermore, with the recent pandemic, a new housing planning concept came to the fore with increasing demand of the people who wanted to live in green areas and suburbans in the healthy-houses with garden. Referenced to the 20th century "garden-cities" this demand was emerged to planning of new concept as "healty-houses" which planned by the private sector; in the out of city, peri-urban, suburbans and even in the city centers.

In addition to the recent problems such as the disasters that the city has encountered, also some studies realized to adapt to Agenda 21. Today, within the framework of Agenda 21, Istanbul is divided into 5 regions, including Zeytinburnu next to the Historic Peninsula on the West. Although, there are not seen some steps taken by the Government and Municipality regarding these specified regions yet, there are no newly developed projects in these regions within the scope of agenda 21. On the other hand, with the new Istanbul Airport, in the European side, the city is rapidly developing towards the northern axis and the northern forests, which are the most valuable green areas of the city as water supply basins placed.

Conclusion

There are poorly planned projects as well as some new housing planning that is well planned and available to be an good example and to be developed as an innovative green projects.

In this context, especially E. Howard's, old English "garden-city" housing models, emphasizing the modern living style of both the 1940s-1950s French derivatives which planned by French architect and planner Henri Prost and the recent, 1990-2000s, modern settlements outside the city, which are planned an example for new and innovative housing planning.

Various versions of these major "garden-city" models were previously designed by French Architect and planner Henri Prost with an innovative approach in the green areas as *cité-jardins*, "garden-cities" and especially in accordance with the groves and woods of pictoresque Bosphorus, in Istanbul planned as *cité-parcs* "park-cities". If new housing projects and innovative housing model are to be developed for Istanbul, these significant housing projects should be taken as an example and developed.

Also a green basis "zooning plan" should be a must for istanbul, which determines and grades the qualities of green areas in the city and which regions should be opened for housing development or how planning should be realize according to quality of green areas and regions.

Some good plannings such as Ken Yeang's K. Çekmece "eco-city" project even though the project awarded first place but could not implemented. Thus, this good project, which will be an example of green architecture and urbanism and "eco-city" planning for Istanbul in the future, could not be implemented, so a planning that allows for a good application could not be realized. If such a good example had been implemented, our belief and expectation that there would be better green planning practices in Istanbul in the future would have increased.

In İstanbul, new housing projects should be determined specificly according to these "zooning plans". Even some green areas should be determine as *zone non aedificandi* (non constructable –green- areas) as Henri Prost

did before or some regions determined only for conditionally for green housing planning can be applied to protect green areas.

As an only Governmental institution according to TOKI's future agenda, the institution continues the planning community-gardens only aims of the green planning without mentioned any other green planning or housing projects explained that in order to create healthy living spaces in cities and to increase the standards of urban green spaces (TOKI, 2021).
Also, the institution carries on its housing production activities in view of priorities such as; urban regeneration and slum transformation projects in cooperation with the Municipalities, as well as the social housing projects also forestation and landscapes (TOKI, 2021).

In this case, it is known that Municipalities in the Turkey do not develop housing projects so, developement of housing entirely at the initiative of TOKI. Since the plans of private construction companies about the future do not contain a very clear and realistic view, the source from which we can obtain the most realistic information about the future will still be Governmental institutions.

On the other hand, the city continues to be planned with new housing projects mostly constructed by the private contractors. There is not enough zooning specifying housing areas and green areas, forests, woods properly. For example, planning a new housing projects; near a forest or grove or lake is not very difficult for existing procedures. Moreover, when forest areas are burned, they can be made suitable for housing construction easily and unfortunately with some laws as seen in the fires in all country.

Although, there are some decisions taken at the 1996 Istanbul meeting and according to Agenda 21 and also it is known that 5 regions in Istanbul are reserved for innovative planning, but there is still an uncertainty about the future developments in this subject. The city continues to urbanization and concretization partially uncontrolled and green areas, woods, forests, continue to decreasing by the not properly planned new housing planning.

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Part II
City Planning: Urbanization and Development

Sustainable urban development: Bioregionalistic vision for small towns

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Abstract

Cities and towns are the social constructs in regional settings. They physically manifest and exist as power centres through various layers of culture, economy, politics and religion. There existed a symbiotic relationship between the 'setting' and the 'construct' in the past. With time and advent of technology, haphazard developments led to degradation of ecological systems and has become a confronted affair. Global warming, its adverse effects and the constant references to the words 'sustainability' and 'resilience' poses questions on the existing planning models. There should be an indispensable change in the planning models to mitigate this existential crisis. This paper unearths the role and possibilities of bioregionalism in the design of sustainable small towns. Bioregionalism derives its meaning from the coexistence of ecology, culture and built form. Small towns experiencing tremendous pressure of urbanisation and rich in natural resources, coherence and identity are taken as a subject of study. There is a possibility of intervening in such towns and guide the urban development in a sustainable way. The paper tries to draw parallels on three theories - sustainability, bioregionalism, small town urbanism and tries to establish bioregionalism as a sustainable development paradigm for an eco-cultural urban development perspective in small towns.

Keywords

Bioregionalism;, region; small town;, sustainable

1. Introduction

From time immemorial, the ancient settlements had a symbiotic relationship with its region. The region in its geographical domain coexists with the unique natural elements and is continuously evolving and shaping the cultural landscape within it. (Vidal de La Blache, 1926). The natural regional features sustaining life, the physical/built features ensuring health and safety and the cultural features propagating tradition were the integral components of early settlements. The relationship between natural and urban systems were strong, cohesive, and interdependent.

1.1 Idea of a 'region' and its uniqueness

***"A region** may have a historic resonance or provide a focus for the identity of its inhabitants. It may represent a landscape, an architecture, or a style of cooking. There is often a cultural element, perhaps represented by a distinct language or dialect. Beyond this, a region may sustain a distinct civil society, a range of social institutions. It can be an economic unit, based either on a single type of production or an integrated production system. It may be, and increasingly is, a unit of government and administration. Finally, all these meanings may or may not coincide, to a greater or lesser degree" (Keating, 2004).*

All regions are unique and distinct in their geography and characteristics. No matter the scale of the region, from local to global in terms of its natural boundaries, they are shaped by humans for various activities. (Passi, 1991; Keating, 2001; MacLeod & Jones, 2001; Murphy, 1991). "A region becomes established when it is identified in social practices and regional consciousness, both inside and outside the region – **it has an 'identity"** (Paasi, 1991). Every region is embedded with natural patterns and free flow of energies. These "natural processes are the foundation of every region's sustainability and are essential to all life and human settlements" (Daniel, 2007).

1.2 Loss of identity and shift from 'local' to 'global'

With the dawn of industrialisation, new technological advancements in the field of planning, transportation, materials and networking; man has overpowered nature and the classic concept of region as a sustainable setting and identity is lost. The studies on the worlds population projection trends informs that 68 percent of the total

global population will live in urban areas by 2050 compared to 54 percent in 2016 (data retrieved from UN World Urbanisation prospects). The trends of urbanisation, globalisation and networking elevates the detrimental effect on regional settings. Globalisation has further boosted the economy resulting in intercontinental transactions, large scale commercial trade and has emerged into a global consumer world. In the present era of networking the focus is on global values which resulted in stereotypes projects and few major accepted trends in all fields. “More than 90 per cent of the population growth occurred in developing economies and today, four in five people live in a developing economy” (UNCTAD stat data). Meanwhile, the **virtually connected global world has disoriented itself from its natural regional setting locally**. The interwoven layer of natural and physio - cultural systems have deteriorated because of insensible human interventions.The **urbanisation and modern planning** has led to a condition which **totally cuts off humans from the ground** where we are rooted. The urban pattern spreads out in a haphazard manner without respecting the natural systems and cultural landscape pertaining to the region.

“By 2030, the world is projected to have 43 megacities with more than 10 million inhabitants, most of them in developing regions. However, some of the fastest-growing urban agglomerations are cities with fewer than 1 million inhabitants, many of them located in Asia and Africa. While one in eight people live in 33 megacities worldwide, close to half of the world’s urban dwellers reside in much smaller settlements with fewer than 500,000 inhabitants” (UN World Urbanisation Prospects, 2018).

1.3 Case of Small towns

These smaller settlements are **small towns; “**they are towns where ordinary residents experience the vagaries of the global economy and the impacts of global climate changes. They are **places that often play a pivotal role within regional economies, that lend character and distinctiveness to their regional landscapes**, and that collectively account for a significant fraction of population in many regions” (Knox & Mayer, 2009). In view of the aspirations of small towns and the fast pace of urbanization; it is right to intervene and condition the emerging urbanity in a sensible way respecting the various layers of plurality that exist in an urban environment. This will make our developing towns more livable and add to the quality of life.

The urban systems are continuously transforming to become **complex and unsustainable** even in these small towns. This is evident in the increasing use of automobiles, resources, energy, escalating pollution levels, poor waste management, shortage of water and food, climatic variations; urban sprawl with increasing density and population, unemployment, unaffordability and economic disparity. This inturn has resulted in greater catastrophes of global warming, sea level rise, floods and drought. As per the World Disaster report 2020, during the first six months of Covid 19 pandemic, more than 100 disasters occurred, affecting more than 50 million people. Studies also show that most of these disasters were triggered by natural hazards and were related to climate and weather changes.

The whole scenario of urban development and planning should be questioned critically and sincere attempts for reviving the lost relationship with nature is to be worked upon for the sustenance of life on earth. What is needed is not a curtailment of urban space planning and design because we cannot afford to do it by means adopted in the past, **but recognition of natural factors as determinants of urban land use and reorientation of our planning and design** policies towards solutions based on management policies which harness the economic forces of nature (Laurie, 1979). “An **environmentally led approach** suggested a return to a more symbiotic relationship between built culture and natural systems, a return with far-reaching spatial implications” (Hagan, 2015).

1.4 Sustainable urban development

“The term '**sustainable development**' has become widely used to stress the need for the simultaneous **achievement of development and environmental goals”** (Pugh, 1996). The concept of sustainable cities has become the dominant universal model of urban development in the last few decades (Bibri, 2020; Bibri & Krogstie, 2017; Van Bueren, 2011; Wheeler & Beatley, 2010; Williams, 2010; Jabareen, 2006; Whitehead, 2003;). The need of the hour is to focus on sustainable agendas 1) at all scale from local to regional, from towns to megacities, from rural to urban on a spatial levels 2) promoting inclusiveness, universal access to all communities, gender, income groups 3) Optimising resource consumption and implementing concepts like ‘cradle to cradle’. “Understanding of sustainable urbanisation agendas could be through authoritative interventions contextualising, assessing and explaining clearly the relevance and importance of three **central dimensions of sustainable towns** and cities everywhere, namely that they should be **accessible, green and fair”** (Davila, 2016). “The concept of sustainability is itself a complex and contested notion at all spatial scales, containing diverse elements, some relatively easy to measure and others more qualitative” (Simon, 2016).

1.5 Alternate development paradigms

Newer development perspectives should be adopted for integrated growth between urban, nature and cultural landscape. This should take into account the carrying capacity, land suitability and feasibility of functions introduced in a region. Irresepctive of the spatial scales from regional to town level, new concepts of "ecological modernisation" (Hajer 1996) can be applied as the base for planning and informing ecological strategies as policies. (Hajer, 1995; Murphy, 2000; Simon, 2016). The urbanity of a region should be moulded locally with a holistic development paradigm as portrayed by the philosophy of bioregionalism, eco urbanism, ecopolis, biophilic cities etc. "Ecological urbanism is the development of multi–dimensional sustainable human communities within harmonious and balanced built environments" (Ruano, 1998). "One another approach gaining increasing attention in this context is ecosystem-based adaptation (EbA), explicitly bringing ecological principles and ecosystem conservation together with climate change adaptation; it may be linked to community-based adaptation (CBA), which may be a fruitful way forward in urban contexts"(Simon, 2016). All these newer paradigms constantly set the environment and ecology as a base to build upon sustainable solutions. Moreover, "transforming our world: the 2030 agenda for sustainable development" (coined by UN, Department of Economic and Social Affairs) reiterates the role of ecology in accomplishing the sustainable development goals and the "SDG, Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable" (coined by UN, Department of Economic and Social Affairs).

1.6 Bioregionalism as a sustainable development paradigm for small towns

This **paper tries to reinstate the relation between place-region-people centric philosophies/theories - sustainable urban development, bioregionalism and small town urbanism.** The paper argues to establish that bioregional planning, an inclusive doctrine which integrates ecology and social constructs, can build up a sustainable development framework for small towns. In the second section, the core values, thoughts and attributes of above mentioned theories are discussed. Third session focuses on correlating the theories and the arguments in favour of bioregionalistic vision for sustainable small twon development. The paper concludes with some parallels based on these theories and arriving at a comprehensive framework for designing sustainable small towns. Literature review is used as a methodological tool to analyse the various theories/philosophies.

1.7 Critical Stand and the questions addressed

Symbiotic relationship between man and nature can be reestablished by adopting alternate development paradigms based on ecological synergies and self sustainable entities. This will ensure the three worthy supports of sustainable development – Environment, Social and Economy with prime importance for the '**setting**' which makes the built landscape resilient, safe and healthy for living. In this view, "Bioregionalism is a new process of thinking and is one such option. It a way of making a new social construct through territories with different entrances, where we will have to work with concepts like consciousness of place and global archaeology and formulate new proposals and test them on the ground" (Prost, 2017). The questions addressed are:

- How can bioregionalism become an alternative development paradigm for sustainable urban development of small towns?
- How can integrated eco-cultural growth patterns of built landscape in small towns continue and develop being resilient, safe and self-sufficient?
- What are possible ways through which bioregionalistic vision moulds urbanism and sustainable development in small towns?

Findings and Way forward

Throughout the discourse of this paper there has been a constant attempt to establish the need for 'going back to our roots' for sustenance of life. Theoretically the paper argues that with sensible and sensitive planning efforts both the dimensions of cultural built environment and natural environment can coexist and mutually help each other to sustain and mitigate. Bioregionalism is one such paradigm, which could be mainstreamed in planning sustainable small towns. The research can continue taking up each of its thrust areas and elaborating further on the possibilities of achieving it fully. Case study based methodological research could be also one another take away for this research to continue.

It is extremely important to be global but better informed locally. "Bioregionalism developed out of a grass-roots interest in how to bring about social change that would lead people to protect and restore the environment on a local level" (Wahl, 2017). Within the concept of bioregionalism, it is flexible and adaptive based on place parameters. That is how it fosters self-sustaining habitats and maintains distinctive places (small towns) within a

region. A revival and reinhabitation at various scales are necessary to ground this concept and to make it practical. Thus, Geopolitics, fluidic boundaries and local communities and features forms the basis of the bioregionalistic vision. It also encompasses self-realization, self-propagation and being responsible in a certain way for being environmental stewards.

"The bioregional principle has important worldwide connotations. It is in line with the vision of Gandhi and Schumacher, who saw a new world order based on small, organic groupings, geared to satisfy all the needs of whole human beings, respecting each others' identities, exchanging surpluses and cooperating rather than competing with each other" (Hart, 1996).

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Carbon neutral district project for regenerating a suburban area within the Reinventing Cities C40 framework

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Abstract

A multidisciplinary approach to urban regeneration is crucial when the project of suburban areas, provides a functional program that includes the combination of technological, environmental, and social innovation. The Reinventing Cities C40 design contest has represented an opportunity for designers to deal with the crossing topics of innovation, sustainability, and circular economy. The project proposals focused on the regeneration of urban areas with specific needs, ranging from the reconstruction of urban ecosystems to the re-weaving of fragile and damaged urbanity, to the promotion of areas devalued by functional empty. The Reinventing Cities C40 framework is supporting worldwide the cities in the renovation process, oriented in developing the abandoned areas with the aim of social, energy, and environmental resilience. The framework promotes the link between the Municipalities, the designers, and the local communities to create innovation on multiple levels, in the design process, in the architectural product, in the validation tools based also on the new contractual definition of business models for social support. The renovation of the Crescenzago area in Milan, Italy, is based on an architectural project that entails an integrated mixed-use system of tower and line buildings ensuring an adequate social and housing mix and connection with the surrounding points of interest and green areas. The architectural project relates to the existing context with a synthesis between macro and micro-urban scale: territory, neighborhood, and the new district. The project moves by the definition of the open spaces that imprints the built ones and defines a direct connection with the green system, which pledges the carbon neutrality of the intervention. The site-specific proposal results from the matrix of strategic and technological transferable solutions that provide solar electricity for 82% of the energy needs and the green capture allows to achieve the zero-carbon goal of the district.

Keywords

Carbon zero district; Urban regeneration; Housing mix; nZEB; Green absorption; Resilient built environment.

Introduction

The challenge of Reinventing Cities (Sedova & Balakina, 2020; Strippoli 2020), is widely integrated in the Air-Climate Plan (PAC) (Energie Partagee Association 2018; Poupeau 2014) of which the Municipality of Milan has recently started the expansion process aimed at the reduction of air pollution (Ripple at al., 2019), to protect health and the environment and thus respond to the climate emergency (Crichton at al., 2009) in a certain and planned time. The challenge expands the perspective of urban regeneration action (Bamdad at al., 2021) in a concrete environmental sense (Houvila, 2007). This challenge, together with the strong emerging demand for new generation of social, collaborative and sustainable housing (Power, 2010), effectively aligns the city to a redevelopment prospect (Carli et al., 2015). This prospect is being pursued concretely by many cities, not only in Europe(Gong at al., 2018; Harding et al., 2004; Dwikardana, 2020) . The redevelopment is achieved both through the adaptation of the instruments of the Plan and therefore normative (Boddy & Parkinson, 2004), and through the facilitation of private interventions oriented in this direction (Kline, 2000). These strategic objectives, naturally integrated with the morphological characteristics of the area of intervention by invitation to tender, are the guidelines of the presented project. The area is located in a suburban area to the northeast of the city of Milan, aligned on the radial route of Viale Palmanova. In this area the building density is soon interrupted by the green section of the Lambro Park and by proximity agricultural residues linked to the ancient agricultural system

(Taccolini at al., 2006). In fact, there are farmsteads and irrigation ditches. The area participates in that morphological complexity made up of fragments - traditional fabric, open building and large single-functional complexes - separated in a rather drastic way from the Palmanova/Surface metro system - just like a river - from the historical agglomeration to the north, that is the core of the village of Crescenzago (Ambrosini & Quadri, 2020). This subway represents one of the main resources for both banks, but they are connected to each other only by a cycle/pedestrian underpass. As in many suburban areas, this 'shore' seems to lack a centre for the social and daily life of its inhabitants (Dalton et al., 2008). Although it has multiple services and connections, in fact, there is a lack of places of aggregation (Graham and Aurigi, 1997) and the whole area appears dominated by a peripheral tranquillity at the limit of anonymity (McQuire, 2017).

Conclusions

The project promoted the development of a social housing with services and mixed use in the area of Crescenzago, Milan, using the public space and the community aggregator of the local market as a key activity for social development and design enhancement. The climate challenges used to define the guidelines of the Reinventing Cities contest are used in the project to shape the morphology and architectural intervention. The project La Main Ouverte recalls the open hand and the space of the square as a fiduciary environment where social interaction are promoted and sustained. The sustainability has a key role in the project choices, the three pillar are all strongly included in the design, and strategies for the carbon zero intervention. The cooperation between built environment and natural environment achieves the goal to have a zero carbon settlement with a buffer of CO_2 absorption, which can be seen as a contribution for the city beyond the housing settlement. The calculation model has been adopted to define the energy needs and environmental impact related to the project defining a methodology for organizing a zero carbon new development while the social aspects are boosted and implemented.

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Investigation of pedestrian life and urban traffic situation with emphasis on human-centered transportation(walking and biking) for a low-income group of employees

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Abstract

Human-centered transportation (walking and biking) has been the cheapest, healthiest, and convenient mode of transportation since ancient times. In the new global economy, walking and biking have become a considerable mode of transportation for a low-income group of residents. The city of Kabul is the biggest city in Afghanistan with scattered space organizations. The unfavorable situation of pedestrian life in the city, insufficient attention to pedestrian routes in the plans, and the poor condition of the road network and sidewalks are among the issues that affect this 4-5 million population city. The purpose of this research is to analyze the current traffic situation in Kabul city and identify the role and share of citizens' use of human-centered transportation (walking and biking) for transportation. This research also aims to investigate the relationship between the economic scope of low-income employees and the use of walking and biking for transportation. The statistical population of the current study was selected from 3 municipal districts as travel zones. Using cluster sampling, a sample participant of 929 people was obtained. It was observed that in the broad context, due to increasing cost and insufficient public transportation, low-income group of employees use bicycles and walking as their reliable mode of transportation. Finally, it is suggested that the spatial organization of Kabul city is redefined, designed based on the new space organization, and in strengthening the local organization and formulating urban transportation strategies in urban strategic plans for pedestrian and bicycle transportation system, especially on the roads leading to employment places. Furthermore, in the plans priority is to be shifted to human-centered transportation(walking and biking).

Keywords

Pedestrian life; human-centerd transportation; walking and biking; Kabul city; low-income employees

Introduction

Human-centered transportation (walking and biking) has been the cheapest, healthiest, and convenient mode of transportation since ancient times(Bahrami, 2012). Researches to date have tended to focus mainly on walkability as being beneficial for health and the environment as it helps reduce many health issues caused by obesity which is the result of an inactive lifestyle (Speck, 2018). However, in the new global economy, walking and biking have become a considerable mode of transportation for a low-income group of residents. Walking and biking are some of the most widely used modes of transportation for work purposes of low-income employees in the city of Kabul although, the roads and pedestrian ways condition is not in favor of them.

Human-centered transport (walking and biking) facilities are not provided in Kabul city, and many roads lack sufficient width for safe passage by pedestrians. Consequently, on some roads, pedestrians are using the carriageways, causing conflicts with vehicles (JICA Study team, 2009). This situation reduces the traffic capacity and increases risks to nonmotorized transport as well. Furthermore, crossing facilities including road marking for human-centered transportation(walking and biking) is insufficient. It is very dangerous for pedestrians and bikers to cross roads without such equipment, especially on roads with heavy traffic. Despite these problems, to improve walkability in the city, it is necessary to use effective measures and strategies to recover the lost identity of sidewalks and design complete streets.

Research question

- With all the above-mentioned uncertainties in city walkability in Kabul city, why is the share of human-centered transportation (walking and biking) relatively high compared to other modes of transportation?

- To what extent does the low-income group of employees gain benefit from the use of walking and biking for transportation?

Conclusion

The purpose of this study is to determine the limits of the use of walking and biking for transportation for a low-income group of employees. It was also shown that human-centered transportation(walking and biking) was mainly used for intra zonal(district)trips because of the lack of proper zonal connectivity and walking and biking facilities. Although the current study is based on a small sample of participants, the findings suggest the investigation can be broadened to cover all 22 zonal districts to obtain more precise findings. Finally, it is suggested that the spatial organization of this city is redefined, designed based on the new space organization, and in strengthening the local organization and formulating urban transportation strategies in urban strategic plans for pedestrian and bicycle transportation system, especially on the roads leading to workplaces. Furthermore, in the plans priority is to be shifted to human-centered transportation(walking and biking).

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Climate-proof planning for an urban regeneration strategy and territorial rebalancing

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Abstract

This paper deals with the issue of the relationship between climate change and the government's land management policies, investigating how urban planning regulation may provide responses to the need for planning and designing the coastal urban settings affected by flooding phenomena as a consequence of gradual sea-level rise (SLR).

In this frame of reference, comparison among the strategic planning experiences put into play in a variety of national and international settings suggests the urgency for policymakers to implement knowledge frameworks on planning instruments, in order to identify– as a prerequisite for defining site-specific design actions – the territorial settings affected by the phenomenon of flood risk.

Keywords:

sea level rise; climate-proof planning; urban regeneration; strategic planning

Introduction

This paper is part of the research conducted within the Department of Planning, Design, and Technology of Architecture (PDTA) at Sapienza University of Rome, with the university research work entitled "*Strategie di rigenerazione urbana per territori climate proof. Strumenti e metodi per la valutazione della vulnerabilità e per l'individuazione di tattiche di resilienza degli ambiti urbani costieri soggetti a sea level rise*" ("*Urban regeneration strategies for climate-proof territories. Instruments and methods for assessing vulnerability and identifying tactics of coastal urban environments subject to sea-level rise*") (Principal investigator: Prof. Carmen Mariano). Dealing with the issue of the relationship between climate change and the government's land management policies, the paper investigates how urban planning regulation may provide responses to the need for planning and designing the coastal urban settings affected by flooding phenomena as a consequence of gradual sea-level rise (SLR). Associated with other climate events like storm surges, this phenomenon doubtlessly represents one of the next challenges with which the "world risk society" (Beck, 2013) will have to grapple, both for the growing impact on cities and territories, and for the empirical evidence of the economic, social, and environmental damage it causes.

The global mean sea level (GMSL) is constantly rising, accelerating in recent decades due on the one hand to the shrinking ice caps of Greenland and Antarctica, and on the other to windier tropical cyclones and increasingly intense rains – all phenomena that may be blamed on the higher temperatures highlighted in the SR1,5 report (IPCC, 2018).

In a nutshell, the global forecasts on SLR at 2100 vary from 53 to 97 cm according to the IPCC (2013), and from 50 to 140 cm according to Rahmstorf (2007). In this scenario, a major impact will be seen along the coasts, causing widespread erosion. This impact on the territories' morphological characteristics will probably trigger internal migration inside the coastal erosion, significantly increasing flood-related risk (Mariano, Marino, 2019a).

An interesting study titled "*Mediterranean UNESCO World Heritage at risk from coastal flooding and erosion due to sea-level rise*" (Reimann, L., Vafeidis, A.T., Brown, S., Hinkel, J., Tol R.S.J., 2018), published in the magazine *Nature Communications*, calls attention to the UNESCO sites located in the coastal areas of the Mediterranean most exposed to flood risk caused by sea-level rise, emphasizing the risk of loss not only on a

material level, but also in terms of the people's cultural identity. This brings the consequent risk of losing the perception of certain landscapes that we may define as "sub limen" , from the Latin *Sub Limen* ("under the threshold, limit" – the etymological root of "subliminal"), which in this context refers to the limit of the coast, the physical limit between earth and sea that determines the landscape, the transition between the present and future landscapes of territories that are in actuality "suspended" because they are affected by a phenomenon of potential risk of loss.

Conclusions

The comparative analysis of the strategic planning experiences conducted in an international setting, with particular reference to the content referring to climate-proof planning, underscores the "strategic role of knowledge" (Talia, 2020) in identifying – as a prerequisite for defining site-specific design actions – the territorial settings affected by the flood risk phenomenon as a consequence of sea-level rise.

Developing this knowledge framework allows policymakers and planners to interpret the content of the areas affected by the risk phenomenon, differentiated by level of danger and in relation to any temporal horizons analyzed for the medium and long term; and to provide for a possible adoption of indications relating to the detailed intervention categories aimed at resolving the risk within the planning instruments, with particular reference to the scale of local urban planning.

In this sense, it is emphasized, in the Italian national setting, how urgent it is to support and incentivize the building of complete and comprehensive databases, and to expand the framework of deliverables for more in-depth knowledge of the territory, aided by geographic information systems (GIS) and relying on the tools and methods of remote sensing and climate modelling aimed at the preliminary construction of vulnerability and risk maps of coastal urban settings, and at the consequent implementation of the planning instruments' territorial knowledge frameworks. The purpose is to guide the definition of intervention macrostrategies and the choice among the actions of defence, adaptation, and relocation for the territories affected by the risk phenomenon (Mariano, Marino, Pisacane, Sannino, 2021).

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The Power of Long-Term Residents in Consensus Building for Reconstruction of the Housing Complex Area: Case study on Tama City, Tokyo

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Abstract

In Japan, the development of housing complexes began around the 1950s, and today there is a stock of around 2 million units, mainly in the suburbs. In recent years, there has been a need to discuss the renovation and reconstruction of these housing complex areas, but it is not easy to coordinate the rights of many people involved. Suwa 2-chome housing in Tama New Town is a case in which the reconstruction project was approved by 91.5% of the inhabitants. This study aims to clarify the process of consensus building among the residents and obtain knowledge for the future regeneration of housing complex areas that require consensus building among residents.

Suwa 2-chome housing area was developed as part of a new town in the suburbs of Tokyo, with 640 units in 1971, and the reconstruction of housing complex area with 1,249 units was completed in 2013. The reconstruction project of Suwa 2-chome housing area involved a project promotion consultant, a design and construction supervisor, and a company in charge of construction work as a reconstruction association. In addition, the Reconstruction Promotion Subcommittee was planned to build consensus among the residents. The Reconstruction Promotion Subcommittee was an unofficial group of women who lived in the housing complex area for long years and were able to act as intermediaries between the residents and the companies. They paid attention to enhance the residents' concern and relieve their fear and burden about rebuilding.

Although unofficial activities are less likely to be recorded in official records, it can be said that the presence of the community, which has been grown step by step on a small scale along with the ageing of the housing complex area, can be a significant power when the area has to recreate a new future vision.

Keywords

Unofficial activity; Resident; Reconstruction; Apartment housing; Consensus building; Interview

1. Introduction

1.1. Background

In Japan, many housing estates have been developed since the 1950s, and now about 2,000,000 dwelling units are stocked. A half of these housing stocks are more than 25 years old, and reconstruction is often discussed due to the ageing of buildings and stricter requirements of earthquake resistance standards. However, the consensus building of residents is not easy, so the reconstruction of old apartments is a complicated task to realize. In fact, the number of completions of reconstruction is only 12,700 units by 2015. When we think about the life span of an apartment, it is important to obtain the way of smooth consensus building for the update of old apartment housing areas now.

1.2. Purpose of the study

The Suwa 2-chome housing area in Tama New Town in Tokyo was rebuilt with the approval of 92% of the residents. The purpose of this study is to clarify the process of consensus building among the residents in this case and to obtain knowledge for the future regeneration of housing complex areas. In this paper, the background and history of this reconstruction project are summarised using official documents and clarified the contents and significance of unofficial resident activities through interview surveys with the members of the activity group and a member of a consultant company. Furthermore, it is clarified that the motivation of the members to continue the unofficial activities even they have a burden in some way through the voluntarily work.

Although the legal framework of reconstruction apartments differs in each country, clarifying the role of unofficial organizational activities by residents in the consensus building process can be useful knowledge for reconstruction and renovation projects of apartment housings not only in Japan but also overseas.

1.3. Previous studies

Concerning the difficulties in reconstruction condominiums in Japan, Saito et al. (2001)[1] summarised the issues in consensus-building during the initial period of reconstruction condominiums. Meno (2004)[2] showed a conceptual model of the consensus building process in the reconstruction of an ageing condominium and showed that construction was started by going back and forth instead of going straight through the four stages of the process. In addition, Hasegawa (1999)[3] pointed out the following factors as successful completion of the reconstruction: (1) ample floor area ratio, (2) location and marketability, (3) dealing with owners who are difficult to pay the reconstruction cost by themselves, (4) a small number of house owners, (5) appropriate support by the developer, and (6) leadership of the promotion organization for the implementation of the reconstruction project. From this viewpoint, clarifying unofficial activity by the residents can be useful to understand the more concrete contribution of the factor (6).

Regarding the Suwa 2-chome housing area, it has been mentioned as a valuable success case in some official reports[4] [5][6]so far. They mainly describe official activities, and there is limited reference to unofficial activities that make use of the networks among residents. However, Yamada (2006)[7] pointed out the effectiveness of an approach method in which housing owners are autonomously involved in the consensus building process in large-scale housing complexes.

Conclusion

In the interview with the members of the unofficial subcommittee, it was pointed out that they paid attention to enhance the neighbours' concern and relieve the neighbours' fear and burden about reconstruction when they did their activities. That means they hold themselves responsible for the reconstruction project while constructing trusting relationships with residents. The reasons for continuing the activities with such responsibility can be: (1) a sense of the importance of reconstruction within themselves, (2) a sense of working together with colleagues to encourage each other, (3) cooperation with official organisations involved in the rebuilding, and (4) a low level of resistance to the activity due to the tradition of self-management.

Informal activities are less likely to be recorded in official records, but they contribute to consensus building within the neighbourhood and collaboration between different organisations by raising residents' awareness of the rebuilding process and by mediating between residents and professionals. When implementing a housing regeneration project which involves many stakeholders, the existence of long-term residents who can assume responsibility for their activities and can build cooperative relationships with various actors will be a significant driving force.

Since voluntary activities by residents are unofficial, they can change their activities quickly and flexibly according to the situation at the time. In addition, since all members live in the residential area, they can continuously participate in the activities for improving the living environment in the area other than the reconstruction project with accumulating experience (Figure 1).

Through daily self-management of the living environment and the realisation of major projects such as the reconstruction of residential areas, the residents themselves share their own ideals for their homes and take action to achieve them. This process makes the house a "home" for the residents themselves. If we can renew our current way of life with a view to the future in a housing environment that requires us to live in harmony with others, the future way of life of human beings and the future image of housing areas can be born from old housing areas.

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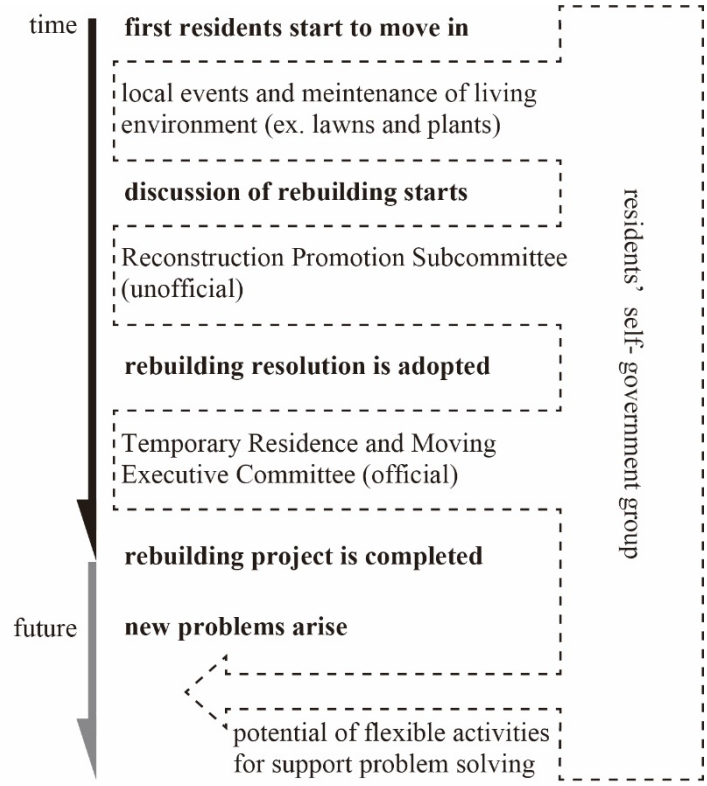

Figure 1 Flexibility of the residents' self-government group in Suwa 2-chome housing area

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New paradigms for city management and planning. From Open Data Knowledge Sharing Platforms to e-partecipation in Italy

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Abstract

For several years, the company has been transforming itself into a virtual society, at different intensities and speeds. The health emergency we are experiencing has accelerated this change also in the Public Administration, one of the contexts that has always presented major challenges in the field of digitization, but which can benefit more from it in terms of simplification and transparency of processes.

The intrinsic capacity of the virtual society, to be detached from spatial constraints in the construction of knowledge and the capacity for renewal, assumes a central role in solving problems due to the coexistence of interests and positions of even extremely different nature (different stakeholders).

One of the areas that could benefit from a digital transition is planning, specifically concerning participatory processes. Recalling one of the principles of the Charter of Public Space, according to which the design of public space should involve, through participatory processes, every singol citizen, it is useful to consider that the wider the perimeter of participation, the wider the possibility of obtaining indications that are genuinely shared within civil society.

The adoption of ICT (Information and Communication Technologies) can therefore allow the achievement of a greater number of city-users, building an in-depth knowledge of the territory both from an objective technical point of view, through the mapping of spaces and their technical characteristics (through BIM and GIS technologies) and through participatory processes, which can define a pattern of the needs of all subjects which insist on the territory, optimizing the definition of hypothetical scenarios.

The research is proposed as a moment of advancement in disciplinary practices aimed at experiencing with new frontiers of participatory planning. The use of ICT tools, whose operational impacts integrate and improve current and future scenarios, allows verifying an operational model that, through the interaction and interoperability between the different actors, can manage the uses and transformations of the territory in the process of urban regeneration and regeneration.

Keywords

ICT; GIS; BIM; eParteciption;

Introduction

In Italy, since the early 1990s, there has been a push towards innovation policies by public bodies through the digitization and standardization of procedures. The modernization of the country is necessarily linked to the digitalization of the Public Administration, which must become the vector of change, towards the elimination of the digital divide and the introduction of e-government practices. However, these objectives are met with widespread resistance to change, making the digitization process a real “cultural revolution” in the Public Administration.

Conclusions

The work aimed to sort out and assess the possibilities offered by ICT concerning the actors involved and their roles and objectives. The workflow identified aims to define what steps a Public Administration can take to make the best use of the ICT available to it, putting in the foreground the safeguarding of the public good,

through the search for the result that can satisfy the greatest number of users. Finally, there is a fundamental element that should be considered throughout the process to increase the effectiveness of actions, namely a constant effort to educate both technicians and citizens in the correct use of technologies. Dissemination of knowledge through the use of ICT in all its forms can only improve the chances of success of operations, which will have to tend to be increasingly optimised and directed towards safeguarding the common good.

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Towards adaptive planning of urban spaces in the context of a new agile urbanism

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Abstract

In the face of the pandemic, regulative measures and the consequent change in behavioral patterns had a tremendous effect on the use of urban public spaces. After all, the health crisis has shown essential weak spots of modern cities, relying on static infrastructures. Experiments like pop-up bike lanes and additional space for gastronomy have shown the ability of municipalities to adapt to changing conditions. Although such short-term interventions can be performed quickly and with minimal costs, municipalities did so in a state of emergency and normally struggle to open public spaces to more adaptive concepts. We argue that removing or adding space for certain uses will be an essential part of future urban planning, temporarily changing functions and infrastructural constellations to cope with ever changing environments. According to Swilling (2011), there are five different concepts of urbanism, describing different configurations of a city's infrastructures. Ranging from the concept of car-oriented urbanism (splintered) to a more modern understanding of cities as ecosystems (green urbanism) and human centered urban planning (livable urbanism), Swilling's categorization shall be used to identify further aspects of a new concept we introduce as agile urbanism. Therefore, best practices from ongoing projects are taken into account to evaluate potential measures that are effective in establishing more flexible planning procedures. The considered projects comprise living labs and undertaken interventions in a variety of urban contexts. The research questions thereby are: How can municipal planning departments react to short-term changes in the urban flow of people? What kind of processes work in adapting urban space allocation? How can planning procedures be adjusted to cope with the fast-changing use of infrastructures?

Keywords

Agile urbanism; Liveable urbanism; Adaptive urban space; City planning

Introduction

Urban system is one of the most complex systems to understand. Due to the high complexity the planning cycles for urban development are very long. For example, the spread of the automobile in the early 20th century pushed the urban infrastructures at the time to their limits. The roads were designed for mixed traffic of pedestrians, cyclists, and carriages. The car reached a higher speed than the other road users and it became clear that a repartition of the road surfaces had to take place. But a car-centric urban planning and urban redevelopment did not take place until the sixties and seventies. Several decades passed before the urban infrastructure adapted to technological developments (Diemer et al., 2020). A similar reorientation of public space could occur in the wake of the COVID-19 pandemic. The shift to home office and the reduction of permanent workplaces and the establishment of co-working spaces will also have an impact on the needs of urban residents. As a result, the need for a change in urban structure will be inevitable. There could be devastating impacts in the urban environment if urban infrastructure adjustments again take decades to rearrange. The municipalities must start to consider a more dynamic and agile urban planning and shorter iteration cycles to preserve and improve the livability of cities. Especially, car-centered cities, such as Stuttgart, should start acting now. Probably they have the biggest fears but on the other hand the greatest chances in a redevelopment of urban space. Considering the development of autonomous und shared driving the demand for parking lots will decrease enormously. The areas liberated from the parking spaces can now be allocated to other usages in the urban context. For example, the areas could be used for recreation but also for communication and information, including through virtual tools, thus initiating a vibrant urban society (Braun et al., 2019).

Conclusion

The interviews and the surveys underlined the desire of the urban inhabitats for social and adaptive urban space. Especially areas for social and community needs as well as for recreation will be more important than ever in five to ten years. The best practices showed how easily municipal planning departments could react to short-term changes in the urban flow of people, if there are willing to do so. The principles of tactical urbanism could be transforming

method for planning procedures. Tactical urbanism starts with simple methods and is kind of a do-it-yourself urbanism. It starts with ordinary ideas, follwing into urban interventions, just as Schanigarten oder Pop-Up Bike Lanes, and ends up in a consolidation for urban processes. This can also led to changed division of road areas and shifts the focus on liveability (Lydon, 2012). Therefore in Germany the establishing for living labs and areas for experimental innovations must go on and the legal restrictions must be exposed on this designated areas. Living labs have the advantage that they only go for a predetermined time, which gives the municipalites the opportunity to test and redesign the ideas for urban changing proceses, by living labs cities become agile. Being agile starts with tendering, so the tendering should also be agile. Therefore it would be useful and future-proof to define some modulare requirements, differentiated according to should and could be. One example of a must requirement could be end-to-end digital planning and the introduction of short iteration cycles. Possible flexible design components could include various target definitions, for example with regard to land sealing or flexible conversion, tailored to the current needs of the local population. In summary, there are already good approaches for establishing agile urban planning through adaptive planning, but in Germany there are still often legal restrictions that stand in the way of this, and this must be changed and flexibilized in the near future.

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The need to adapt and change the old planned areas of Indian cities with future needs of the city.

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Abstract

Evolving with the current trends in terms of transportation is a must for any city as a whole. Urban planning is always seen as the planning for people. Transportation is an integral part of the City's mobility, it's necessary to take the transport systems to the level at which it is required in today's world. With increasing development, there tends to be a pull by the city for the people in terms of better living. With increasing migration to the developing cities, the population of the city takes a rise up. With the rise up in population, the existing infrastructure becomes insufficient be it in terms of pedestrian or vehicle mobility. Before pull factors from the cities the existing scenario fits in perfectly for the people as there is a no larger demand for greater transport systems. But the rise in population demands higher locomotion of people which in turn demands better transport infrastructure and social equity in movement.

The research on the local area plan of Nashik Ward 15 which is located in Maharashtra, India, throws light on how the city needs to be molded into a better transportation hub as per the demand. From being an underdeveloped city to being one of India's fastest developing cities, Nashik has a good scope for serving the citizens in terms of pedestrianization and transportation. The majority of Nashik city has an insufficient infrastructure in terms of pedestrianization and this along with road widths that are left unutilized with large shoulders lose their identity and people use them as parking for cars. This leads to a dangerous trend as people interpret the space according to how they deem fit. This ward was planned under a town planning scheme but still faces these issues and with rapidly increasing residential dwellings pedestrian mobility has not been given the importance it needs.

This paper looks at how planning interventions are needed to even planned wards in Indian Cities that adapt to the current Indian realities and needs of the people. As an upcoming smart city, Nashik must be given elegant vehicle mobility as well. There currently lie various loopholes which should be cleared out. Many places in Nashik which are at an intersection of major roads are having roundabouts. The current capacity of roads is sufficient to the volume of cars which is flowing on the roads. The problem lies that the number of vehicles on roads in peak hours is increasing which may cause a difficult situation in the future. This research paper shows how junction improvement and smart and intelligent road design that is focused to a high degree on spatial requirements of each neighborhood in the ward will be able to meet the needs of the city in the future and drive connection of people and their movement through the city.

Keywords

*Mobility **;** Locomotion **;** Dwellings **;** Spatial*

1. Introduction

Before the 1990's India had a lot of developments made in terms of urbanization. Various towns were planned based on the required needs at that time. But the problem was updating the infrastructure with the current needs. Urbanization calls for more people settling in the developed area due to the pull factor for jobs and better facilities than rural areas. Currently, India has 28% of the population living in rural areas while the number is projected to increase up to 50% by 2050 (RAKESH MOHAN, 2004). Due to the ever-increasing demand for services and facilities as well as standard of living the population will keep increasing in the developed areas. India is one of the major developing countries in the world, has to bring updates in the way the new cities are planned (Byrd, 1990). The areas which were planned before the millennium may lack the infrastructure which is needed in today's world to withstand the capacity of increased population and the evolving changes that have taken place in these areas. These areas have space but that has not been utilized and put to use. The research

paper focuses on how the planned areas need to evolve with the times and ensure that development that takes place is sustainable and the planned aspect of these areas can be utilized completely

1.1 Case study of ward 15, Nashik

The following research paper focuses on the case study of the planned ward (Corporation, 2015) from the TP scheme (Maharashtra, 1966), which was a feature of the old planned cities. The paper will present a scenario of the ward in the neighbourhood of Nashik City as an example to show how modern interventions are needed to sustain the overall development in cities from the ward levels themselves. Along with ward-level focus, various other aspects will be discussed in brief. The ward of focus is Ward 15 from Nashik city, Maharashtra, India. The data includes primary as well as secondary data. The primary data is a part of observations from the primary survey while the secondary data is obtained from the Nashik Municipal Corporation.

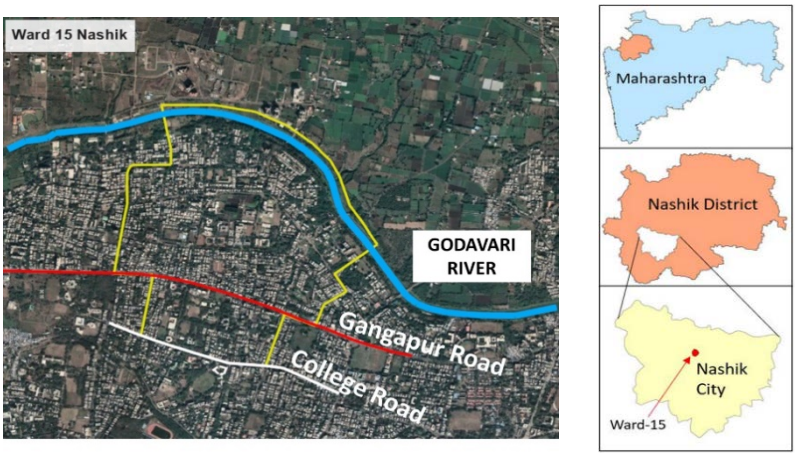

Figure 1. Key map and Satellite image showing the ward

The following images depict the development of the ward over the years. From 2005 to 2020 the ward has seen tremendous developments in terms of residential and commercial built-ups.

Figure 2. Change in development from 2005 to 2020

Conclusion

Evolution is a must if any city wants to stay with the growing demand in terms of infrastructure, connectivity, ease of living and facilities. Being one of the fastest developing cities in India, Nashik City is bound to have major infrastructure improvement in coming years. The above research paper took a deeper dive into the findings made from the primary survey conducted in Ward 15, Nashik City. The proposed recommended changes were given at the Ward level, which can be applied to all wards to develop a sustainable city which meets future demands. As of Nashik Ward 15, the area was planned earlier before the millennium. The requirements at that time were less as compared to the current and future requirements. The research shown also indicates that there were very few developments in terms of residential, commercial and educational spaces. The need for pedestrianization at that time was not taken into consideration. As the developments started to come in the city generated a full factor for people. The developers found the area as an important place for creating built up

spaces. With the increasing developments people started to reside and also educational centres developed. As people started to reside, more private vehicle ownership came in. Roundabouts were designed for smooth movement and non time consuming flow of vehicles. The analysis indicated that currently the traffic volume is within limits but with the increase in population it will invite more accidents. Therefore in the areas where there is a high chance of vehicle accidents should be given signalized junctions. Also, there is a lack of footpaths for smooth pedestrian movement in many places. Now currently as there are many schools in the ward and also as the ward is dominantly residential, the pedestrian movement must be taken care of and people must be encouraged to use cycling and walking by providing the necessary infrasturture like footpaths and cycletracks and bringing equity in allocation of road space that left by planners fifty years ago for vehicles. In the ward, many roads have unused shoulders. As per the demand, the footpaths need to be made for the smooth locomotion of pedestrians. Current public transport is not up to the mark. As the traffic is projected to increase, public transport must be developed for smooth vehicle flow. Thus, the minor aspects which people encounter on a daily basis need to be addressed and worked on, which will create a major impact to ensure that people will move towards making more sustainable choices when it comes to moblity and ensuring that the growth and development of these areas that were planned remain relevant and provide the needs of the city today and for years to come.

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Compactness as a Condition, Compaction as an Ambition - Potentials and Pitfalls of an Interdisciplinary Global Debate on the Compact City

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Abstract

The Compact City is discussed intensively in academia, with ambiguous and inconclusive outcomes regarding its contribution to sustainability. In the practice of urban design and planning, however, compaction is used globally - and largely uncritically - as a tool for sustainable development. Hence, there are large gaps in the communication between different academic disciplines, between academia and practice, and between different geographies. This paper aims to address these gaps by proposing a new way of structuring the Compact City debate and testing it through an extensive literature review and take-aways from an international symposium. The hypothetical premise is that the Compact City can be either a measurable *condition* of degrees and effects of compactness, or an *ambition* for compaction that is articulated by various actors. For compactness as a condition, the review looks particularly into studies that define indices for measuring compactness and studies that investigate the social and environmental effects of compactness. It is found that a missing consensus on indicators makes it difficult to address existing research gaps through comprehensive studies. For compaction as an ambition, the review looks into existing analyses on policies for compact development, as well as critical urban theory that questions the Compact City conceptually. It is found that while policy analysts are mainly concerned with aligning compaction ambitions for more efficient practical application, urban theorists express fundamental concerns about the desirability of compactness. Drawing on discussions of the symposium, the paper shows that the hypothetical premise is suitable to reveal numerous deficiencies. Central issues include the introduction of multi-scalar approaches and the establishment of indicators beyond urban form. It is concluded that while the Compact City debate has an urgent need for reformation, it has the potential to make holistic and inter-disciplinary contributions to sustainable development.

Keywords

Compact City; Compactness; Compaction; Urbanization; Sustainable Urban Development; Literature Review

Introduction

The Compact City is one of the leading paradigms in urban development (Bibri, 2020). The term was originally introduced by the US-American mathematicians Dantzig and Saaty (1973). While their actual proposal is merely discussed, their principles of high population density, high accessibility of public transport, and high degrees of mixed-use are commonly associated with the Compact City until today. More recent definitions try to simplify the concept into a combination of density and intensity (e.g., Garcia & Vale, 2017), but a common and specific definition of the Compact City is yet to be established (Burton et al., 1996; Lee et al., 2015; Neuman, 2005; Westerink et al., 2013).

In addition to the conceptual difficulties of the Compact City, its actual benefits are also constantly questioned: while the economic effects of urban compactness have shown to be mostly positive, its social and environmental effects are more ambiguous (OECD, 2018). Furthermore, scholars have been criticizing the Compact City to be a simplistic antidote to urban sprawl (Rode, 2018), and a tool to pursue neoliberal agendas (Kjaeras, 2020). These concerns have lead to significant scepticism towards compaction among researchers (Neuman, 2005). However, this has not stopped practitioners from heavily promoting the Compact City: a majority of national governments worldwide has introduced policies for compact urban development (OECD, 2012). Despite continuous criticism in research, practitioners keep pushing the Compact City as "the most preferred model of sustainable urbanism for responding to the challenges of sustainable development" (Bibri, 2020, p. 1). This enthusiams of practitioners is not supported by researchers.

The paradoxical nature of the Compact City makes it a controversial part of sustainable urban development. While much effort is put into empirical studies and the in-depth investigation of small aspects of the Compact

City, little attention seems to be paid to the overall structure of the debate, methodological approaches, and the formulation of research agendas. This paper addresses these shortcomings. After shortly reiterating the motivations for a reformed way of discussing the Compact City, a possible structure for the debate is proposed: compactness as a condition, compaction as an ambition. This structure is tested through a qualitative literature review that gives a comprehensive impression of the deficiencies and potentials of Compact City research. Lastly, the suitability of the hypotehtical structure is assessed by reflecting on its application in panel discussions during an international symposium. Hence, the paper tries to identify different strains of disciplinary discourses, structure them into sub-themes, and eventually contribute to a streamlined global debate for sustainable compaction.

Conclusions

The structural premise of compactness as a condition and compaction as an ambition has proven to reveal a multitude of deficiencies in recent research on the Compact City. The overlay with the panel discussions suggests that the premise is an effective way of giving an order to the debate. Nonetheless, the degree of consensus in the compactness-discussion seems higher than in the compaction-discussion. One reason for this might be the disciplinary discrepancy between practice and theory that was identified in the literature review. But this also shows the importance of establishing a discourse between critical theory and its efficient practical application. Continuing and advancing this discourse is thereby a crucial task for future research that might be more urgent than the need for quantification and empirical synthesis that was identified in the compactness discussion. Eventually, the combination of these elements is likely to be most suitable for a productive form of theory-building through concrete applications (cf. Storberg-Walker, 2003).

Despite numerous deficiencies and challenges, this paper also presents some promising potentials of the Compact City debate. Most importantly, the multiple disciplines concerned with the Compact City enable a comprehensive scholarly debate with holistic implications for various fields. An interdisciplinary debate makes it possible to communicate issues and suggestions to a variety of actors. Cross-disciplinary collaborations and the strong link to sustainability can lead to research that is highly sought-after in the current academic environment.

Lastly, the Compact City debate could have the potential to contribute to sustainable development without the pressure of comparable paradigms: as research by Schraven, Joss, and de Jong (2021) shows, the Compact City receives constant attention in academia since several decades, but did not experience a rapid jump in research activity like it was the case for the Eco City, the Sponge City, or - above all - the Smart City. This might spare the Compact City debate from activities that try to buy into a trendy topic, and instead enable a reasonable and rational development towards a useful principle for sustainable urban development. This positive possibility should, however, not hide the fact that the Compact City debate is already being harmed by inflated expectations from urban practitioners.

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From the Neighborhood Unit to the 15-Minute City.

Past and Recent Urban Models for the Post-Covid Future

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Abstract

This paper critically discusses the 15-Minute City model through a preliminary review of its historical trajectory, from prototypes to recent reconceptualization such as Perry's Neighborhood Unit, Caltrophe's Transit-Oriented Development, C40's Agenda for a Green and Just Recovery, the One-Minute City, to name but a few. Furthermore, it illustrates the limits and potentialities of this model to inform future research directions towards the creation of eco-social urban systems for the post-Covid future.

Keywords

15-Minute City; planning, urban design; proximity; sustainability.

1. Introduction

With the outbreak of the Covid-19 pandemic, the implementation of restrictive measures limited free circulation, forcing people to stay at home and walk around their neighborhoods. These massive changes in lifestyle and habits led to rethinking living and working conditions and fuelled discussion about sustainable urban models for the post-Covid future. Following up on the resurgence of the 15-Minute City model, other concepts such as the 20-Minute City and even the One-Minute City have gained momentum in public and specialized debate.

According to the Cambridge Dictionary[1], the 15-Minute City can be defined as a "a city that is designed so that everyone who lives there can reach everything they need within 15 minutes on foot or by bike". This model was recently revived by Carlos Moreno - smart cities advisor for the city of Paris - and proposed as a new sustainable urban planning model for Paris[2]. Similarly, the 20-Minute City model has been envisioned by the Melbourne Minister for Planning for developing the 20-Minute Neighbourhood Pilot Program, which is part of the metropolitan planning strategy defining the future shape of Melbourne over the next 35 years[3]. On the other hand, the One-Minute City is an urban pilot program operating at the street level launched by Vinnova, the Swedish national innovation agency, in partnership with ArkDes, a sustainable design firm and the Swedish transportation regulatory agency (Hill, 2020).

The 15-Minute City, although sometimes presented as a novel model, it is rooted in concepts and theories developed in the XX century such as Christaller 's Central Place Theory (1933), Hall's Proxemics Theory (1966), Perry's Neighborhood Unit (1929), Caltrophe's Transit-Oriented Development (TOD) (1993) and Gehl's Human Scale City (2010) to name but a few, which can be grouped under the umbrella term of the Proximity City.

These models are characterized by proximity and accessibility to mixed activities and walkability, and are applied for developing multi-scale sustainable and resilient urban regeneration strategies. However, once turned into design projects, they did not always contribute to strengthening social inclusion and sa ense of community nor achieving urban and environmental quality. Conversely, they indeed resulted in projects built in privileged areas of cities, such as tourist, business and fashion hubs.

[1] The Cambridge Dictionary has recently launched a pool to ask whether the 15-minute city should be added as a new word to the dictionary https://dictionaryblog.cambridge.org/2021/05/31/new-words-31-may-2021/.

[2] Source: https://www.paris.fr/dossiers/paris-ville-du-quart-d-heure-ou-le-pari-de-la-proximite-37.

[3] Source: https://www.planning.vic.gov.au/policy-and-strategy/planning-for-melbourne/plan-melbourne/20-minute-neighbourhoods.

Against this backdrop, this paper aims at critically discussing the 15-Minute City model by analysing its historical trajectory from prototypes to recent reconceptualization. In so doing, we aim at unpacking limits and potentialities of the 15-Minute City model to orientate future research directions in support of eco-social transitions of urban systems. Building on this preliminary review, a comparative case study analysis of proximity-based planning models implemented in three European cities is currently under development and will be published in a follow-up publication.

Conclusion and future research directions

From the preliminary review of the case studies illustrated in this article, it emerged that the theme of proximity crosses the history of urbanism either as a way to recover a human-scale urban model or more recently as a means to address sustainability. However, beyond statements of intent, these models not always contributed to strengthening social inclusion either a sense of community. Conversely, they often were turned into exclusive urban design projects in privileged areas of cities or low-income neighbourhoods, where they favoured the developemnt of gentrification processes. According to several authors (e.g. Smith 2002, Wyly & Hammel 2003, Hetzler, Medina & Overfelt, 2006), this happened in market-driven new developments and redevelopments taking place in US cities following New Urbanism's principles.

Currently, the 15-Minute City model is under implementation in several Western cities. The scrutiny of the selected policies, plans and pilots presented in this article showed that they share common characteristics consisting of human-scale design, access to public transport, a mix of services and activities, environmental quality of public spaces and pedestrian-friendly streetscapes. It also emerged that little research has been done to in-depth investigate the spatial, social and environmental outcomes of these programs and projects. To contribute to this research direction, a comparative case study analysis of proximity-based planning models implemented in three European cities is currently under development by the authors and will be presented in a follow-up publication.

Furthermore, this preliminary review highlighted that issues of replicability and inclusiveness affec the 15-Minute City model and deserve further research. For example, it is recommendable that sensorial and cognitive disabilities across different populations (e.g. the elderly) are accounted for, by mobilizing a diversity, equity and inclusion approach (see *inter alia* Agyeman and Evans, 2003). In terms of replicability, it is worth exploring to which extent the 15-Minute City model can be applied to other contexts, such as in cities in the Global South and Asia. The fact that this model is considered suitable for solving living and working issues, that originated from the pandemic outbreak in European and US cities, does not necessarily assure that it will work properly in other geographical contexts. Further studies are needed to explore the validity of the 15-Minute City as a sustainable, inclusive and affordable urban model for the post-covid future.

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Mapping Social Cohesion and Identity in Intercultural Public Spaces

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Abstract

Across the world, the ongoing Covid-19 pandemic has challenged urban systems and structures, highlighting societal vulnerabilities of cities and the systemic inequalities among communities within them. At the same time, the necessary measures enacted in response to the pandemic revealed the need for more work examining the role of social interactions and social cohesion in supporting resilient communities during challenging times. While we know that the presence of strong social ties among various communities, particularly in intercultural cities can promote civic engagement and participation, we do not know enough about the mechanisms - processes, places and tools - that create these ties and the ways in which they provide opportunities for equitable planning and recovery from unexpected and potentially catastrophic events.

This paper examines the role of urban public space in the development and maintenance of social ties, with a focus on intercultural communities, during the ongoing Covid-19 pandemic. Our focus on interculturalism is influenced by Levrau & Loobyuck's (2018) definition, which gives special attention to the contact between people of different backgrounds and shared community memberships, creating a new paradigm based on the idea of interpersonal contact as a tool to create a stronger sense of societal belonging. To this end, we pose the following question: Can social interactions, identity, and cohesion in public space be mapped spatially as a means to document and identify community resilience in the intercultural urban context? As it was observed that public spaces became dynamic places of gathering, of well-being, and of civic expression, in order to support the people and communities around them, we aim to shed light on the role of public space in supporting the development and maintenance of strong social ties in intercultural communities at the neighborhood level.

Keywords

Social Resilience; Space and Culture; Urban Public Space, COVID-19, Interculturalism

Introduction

Covid-19 has impacted low income and minority communities significantly. In addition to experiencing higher prevalence rates (Truong & Asare, 2021), people living in these communities have less access to high quality healthcare, and a higher prevalence of high-mortality diseases like obesity and diabetes. Data from 2020 showed that in New York City, the mortality rate from Covid-19 was twice as high for Black and Latino residents than for White residents (Wade, 2020). On a global scale, age-old issues of inequality in health and healthcare access were exposed, along with the need for more conversations around the role of social and community resilience in dealing with and recovering from the effects of the pandemic.

We know that the pandemic, and strategies to reduce the spread of the pandemic, have put a strain on mental health for all (Kumar & Nayar, 2020). Public spaces like parks, plazas, public squares, played a significant role in creating much needed opportunities for social interactions and connections during long periods of isolation. Access to green space and engagement in physical activity which provided mental and physical health benefits were useful tools in maintaining the health and wellbeing of people during these times. However, there are still a lot of unknown barriers and opportunities surrounding the impact of the use of public spaces as vehicles for social cohesion and connection. For instance, while research shows that both children and adults who visit parks are more likely to meet the recommended frequency, type, and intensity guidelines for physical activity (Flowers et al, 2019), gaining physical and mental health benefits, we do not know how the use of these spaces foster social interaction and strengthen community ties.

Urban public spaces allow people to mingle, interact, and connect, providing both social and mental benefits, and contributing to strengthening community ties. The pandemic fractured this balance in city living and created a

void in the social fabric of most cities by keeping people indoors and reducing their use of neighborhood parks and outdoor public spaces. While barriers to the use of public spaces can occur at the individual, family and community level and include neighborhood inequity, lack of access to high quality facilities, transportation, and safety, the pandemic has created a novel situation where in addition to these barriers, people are unwilling or unable to spend time in parks or engage in physical activity as a means to prevent disease infection, an attitude that might linger long after the pandemic ends (Volnec et al, 2021).

Our particular interest in public spaces in intercultural communities is inspired first by our experiences living and working in diverse communities, as well as our prior work in examining diversity of backgrounds and experiences as a facilitator rather than a barrier to social cohesion in communities. Social theories including the similarity-attraction principle posit that higher social cohesion occurs between individuals with high similarities. This theory states that people are attracted to those like themselves and prefer to be with other individuals they find similar in terms of values and beliefs (Stahl et al., 2010). The agreement of individuals on these values and beliefs reinforces positive attitudes. While individuals' attraction to others like themselves has a positive effect between similar units, the lack of attraction to dissimilar individuals has a negative effect on integration (Lichtenstein et al., 1997).

The negative relationship between diversity and social cohesion in the similarity-attraction principle is supported by Tajfel's social identity theory. The Social Identification and Categorization Theory states that individuals belong to a group based on their perceptions of how they fit within the group and their perceptions of similarities between group members. Social Identity is described as the self-identification or self-categorization an individual places on themselves to situate themselves within a team or a group. People categorize themselves into groups based on similar social identities and exclude themselves from other groups based on dissimilar social identities. The belief in shared values between members of the same identity groups promotes favorable behaviors between team members (Stahl et al., 2010; Tajfel, 1974).

We care about interculturalism because although theories tell us that there should be lower social ties in these cities, we view this diversity of backgrounds as a driver of social cohesion and community resilience, and are interested in the spaces and places that support and foster intercultural interactions. Interculturalism "gives special attention to social interaction, contacts between people of different backgrounds and shared membership, creating a new paradigm based on the idea of interpersonal contact as a tool to create a stronger sense of belonging together" (Levrau & Loobuyks, 2018). This differs from multiculturalism, which has been the main focus of western research and has received backlash since the 90's through policies and rhetoric reflecting anti-immigrant sentiment (Levrau, 2018). Multiculturalism is hyper-focused on cultural difference, thereby disregarding the presence of common values that are present across different cultures. Interculturalism poses "a remedy, being allegedly well-suited to address some shortcomings of the multicultural approach" (Levrau, 2018).

This paper examines the role of urban public space in the development and maintenance of social ties, with a focus on intercultural communities, during the ongoing Covid-19 pandemic. Uncovering these factors and identifying the reasons behind social interactions and the use of public spaces in intercultural communities requires the use of social theories and methods in order to provide multi level strategies that can, in part, address present day challenges of social and community resilience and contribute to strategies to achieve equity, catalyze communities, and improve the health and wellbeing of people in society.

Conclusion

The aim of the study was to explore the relationship between urban public space and social cohesion within intercultural communities. This research suggested a positive correlation between areas that had increased public space usage and social cohesion the Germantown community. We suggest the benefits of this research could be extended to sustainable urban development and space planning for resilient communities in line with the 2030 United Nations Sustainable Development Goals. In addition, we suggest this research provides potential into the

exploration of the role of the public built environment to help in times of collective traumatic events such as pandemics

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City-effect: new centralities in post-pandemic regional metropolis Pescara-Chieti

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Abstract

Through Covid-19 pandemic, the functioning of cities has been challenged, both spatially and a-spatially, exposing parts of urban areas to obvious disruption. It is clear that so far cities have expressed spatial centralization on centralities with identity values and specific functions. The frequent inconveniences from health limitations have underlined the important relationship between the compact city and the conterminous fragments, in order to start a process of sustainable rebalancing of the urban system. The purpose of this work is to present the case study of the regional metropolis Pescara-Chieti, highlighting how these fragments can become new complementary centralities with respect to the continuous city. These additional centralities can form a multi-polar system with different intensities and contribute to raising the quality of life in peri-urban areas.
Based on a review of the literature, a set of indicators and criteria is proposed to identify the city-effect, that is the capacity of the city to offer, attract and contain. The recent paradigms of the 15-minute city reinforce the thesis advocated and the consequent reconfigurations of urban space as a driver of regeneration and mitigation action at different planning levels. The methodology was applied to a conurbation of 14 municipalities in the Abruzzo Region (Italy), with polarity the city of Pescara. The proposed work reasons on city users, defined as dynamic on the territory by Istat (Italian National Institute of Statistics), on the spatial dislocation of amenities and accessibility. The results have underlined the relationship between spatial continuity and functional integration of urban fragments – interested by the movement of internal dynamics – with different degrees of city effect. For the latter to be triggered, it is necessary that urban fragments assume the role of new centrality through the project, in order to counteract phenomena of marginality.

Keywords

City-effect, centralities, spatial planning, public space, post-pandemic city

Introduction

The Pescara-Chieti conurbation has always been an area characterised by strong dynamism thanks to the provision of administrative, educational, health and cultural services and the consequent presence of flows gravitating towards the latter.

In recent years, Pescara has assumed the role of the main pole of attraction for the conurbation of the mid-Adriatic area, both at a regional and supra-regional level; however, the recent changes in the socio-economic system and the interest in a socio-ecological policy are forcing a review of the overall governance of the conurbation, so that it can rebalance the existing gap between the compact city and the "dust municipalities".

The continuous evolution of the role of the metropolitan area - with respect to its classical interpretation - not only modifies the relationships between the city itself and its parts, but also determines a territorial influence and initiates structural changes in the socio-economic sphere. The emergence of centralities defines both the trends of the real estate business as well as the decision of users and, therefore, the consequent development of certain parts of the city.

The thesis of the paper is to support how the creation of a network between the city in spatial continuity and the neighbouring fragments can trigger the *city effect* and an incremental development of the Pescara-Chieti conurbation, in terms of spatial quality and socio-economic and environmental sustainability.

This paper is divided into:

- *Literature review*, as a reflection on the main research conducted on the theme of the *medium sized cities*, *centralities* and the *city effect;*
- *Methodology*, that is the presentation of the various stages of research;

- *Conclusions*, namely a reflection on the Pescara-Chieti conurbation and how space should be reinterpreted in order not to be a passive component of territorial dynamics.

Conclusion

«The environmental quality to be restored is that [...] produced by the unstable balance of many autonomous building projects within a system of incomplete collective rules. If the demand for beauty leads to an appreciation and defence of historic centres, it is because in them we are looking not only for a sum of values, but for the secret of a method to emulate or approach in the preparation of modern scenarios» (Benevolo, 1996).

Until now we have lived in the city of the *hyper-centre* where everything is concentrated in a business centre; today the search for beauty, for psycho-physical wellbeing, for a city on a human scale has led us to re-discover the historic centres. To emulate the historical urban palimpsest in modern cities is not to replicate the spatial configuration, but to read it with modern paradigms. The 15-minute city paradigm, understood in its essence, is nothing more than the idea of the historical city and the multiple religious structures within a few metres. In modern terms, the same concept makes clear the need for essential services within a few minutes' radius, especially in peripheral and marginal contexts. Unfortunately, talking about essential services, equipment and facilities implies a reflection on how they have been interpreted - often exclusively - in terms of monetisation. The minimum endowment in terms of services and equipment has been reduced to "monetisation" to be invested in generic '*urban regeneration*' (Agostini, 2020). Standards, services and equipment must evolve from an exclusively economic concept to a socio-economic and socio-ecological one, especially in the peripheral areas of the city. In fact, «the theme of the peripheries, parts of the city where situations of social fragility, inadequate urban quality and poor services are concentrated, has recently come to the attention of researchers, political debate and institutions, both at national and local level» (Cognetti, 2020: 126).

Therefore, the continuous and progressive change of the role of urban places and territory must be accompanied by the construction of valid contextual visions. «The 'space project' (regardless of the scale) must be able to produce new local configurations adapted to the needs imposed by 'recovery and resilience' programmes"» (Mascarucci, 2021b: 76).

Current planning requires the cooperation of transversal knowledge: (i) territory and urbanism, (ii) economics, (iii) sociology, (iv) geography, (v) administrative law, (vi) management, (vii) meteorology. One cannot continue to talk about social infrastructure if sociologists and geographers are not involved. One cannot talk about combating climate change if one does not cooperate with meteorologists. A strategy that is in line with the environmental issues of the *New Green Deal* and the socio-economic recovery assets of the *Recovery Plan*.

The time of Urban Planning and Architecture as protagonist-actors has long since passed; the challenge is to understand to what extent they are still able to ensure functional, adaptive and performing urban environments: it is the time for synergy. «Should we abandon the interpretation of urban space we have inherited as a specific form of settlement, or at least radically rethink it?» (Brenner, 2015: 26) The question is not to '*abandon*', or to rethink space "radically", but to understand what value it exerts in the urban and socio-economic system, both in the material/immaterial dimension and in the local and territorial dimension.

Anthropic systems have been stressed by urban concentrations, uncontrolled land consumption, economic crises and health emergencies, subordinating urban space to a residual element of the city. Both space and multifunctional buildings can become vectors of a newfound urbanity, especially when combined.

In order for the conditions for such a reversal to occur, it is necessary for urban environments to return to being 'pivotal elements' of the 'city-system' and to perform social, environmental and cultural functions.

The new configuration of medium-sized metropolitan conurbations requires the definition of an unprecedented concept of 'multipolar centrality', investigating the new 'rhythms of use' of the widespread networked city.

It is evident «that the intermediate urban system can prove to be a powerful lever for development, in the current economic situation, particularly for the revitalisation of the territorial areas most characterised by phenomena of socio-economic stagnation. Therefore, not only is the city once again the fulcrum of development policies, but it is precisely the intermediate urban system which (if properly planned) can become the possible *strategic asset* of

the new territorial competition» (Mascarucci, 2021a). Therefore, we speak of «systems of areas, which are redefined around a specific 'network' fruitive dimension, linked by processes of multi-level *governance*, in which formal actions of the urban project interact with spontaneous actions, temporary or lasting, able to strengthen the identity of local communities» (Arcidiacono, 2020: 33).

The current city and conurbations are no longer represented by the theory of central places, but are the result of a system of centralities organised by attractiveness and capacity for self-containment.

Previously, the term centrality was associated with strategies aimed at giving quality to the existing city with policies to spread that urban quality constituted by the centre's attractive and identity values (Marcelloni, 2006); today - instead - the term is configured as something new and flexible, that is, the capacity to be a "place" and express urban effect and optimal levels of quality of life.

The aim of this work was to reinterpret the contemporary city with new terms and new design guidelines in order to abandon the planning of the «urban without place» (Webber, 1964) and pursue the idea of a «palpable urbanity» (Marcelloni, 2006), that is a *city-effect* intended as an alternative, complementary and synergic structure for territorial and local development.

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Transit Oriented Development (TOD) vs. Capability Approaches vs. Sumak Kawsay: conceptual steps toward the decolonisation of transport knowledge

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Abstract

This paper aims to add to the debate on the decolonisation of transport knowledge. It will do so through a brief consideration of Transit Oriented Development (TOD) through the lenses of Capabilities Approaches (CAs) and Sumak Kawsay indigeneous philosophy.

Current thinking on transport has the tendency to focus on efficiency of movement and on economic growth. This has led to the birth of various urban planning methodologies, where Transit Oriented Development (TOD) has gained popularity over the last decades. However, this focus does not lead to improvement of living conditions per se, especially in regarding the most vulnerable urban populations. The TOD 3 Value (3V) model draws together current thinking in TOD, which is largely focused on economic growth and Land Value Capture (LVC). In contrast, for CAs 'value' is understood as a person's capability of having a freedom of choice to achieve what they have reason to value. Furthermore, truly understanding 'valuable' might entail stepping back from pre-existing conceptual frameworks from the Global North. This paper argues that examining TOD and CA through the lens of Sumak Kawsay philosophy will enable such a step back. TOD focuses on economic growth. CAs on personal freedom of choice. In contrast, Sumak Kawsay seeks to reach a balance between community, nature and the cosmos.

Raising an academic debate around TOD, CAs and Sumak Kawsay is likely to lead to the complication, slowing down and disruption of certain epistemologies underlying current Compact City theory that is promoted for sustainable city planning the world over. Nevertheless, bringing new concepts and theories into circulation is necessary if we are to achieve true decolonisation of transport theory. Whilst there is no clear-cut methodology for this to date, contesting expert knowledge about transport from outside historically emerged centres of expertise inevitably plays a crucial role.

Keywords

Decolonisation of Transport Knowledge; Transit Oriented Development; Capability Approaches; Sumak Kawsay.

Introduction

We need to question the pedestal of western science, and absorb, respect and learn from other ontologies regarding the world around us and our role in it. In scholarship this is conceptualised as the decolonisation of knowledge. Harari (2015) highlights how the spread of colonialism went hand in hand with the belief that science held answers to everything, and that capitalism would finance this. He writes how with the correct scientific research things just needed to be 'discovered'. This research was financed with capitalist investments that offered reaping potential future benefits. He argues this winning formula led to the spread of a Eurocentric view, which through Imperialism came to dominate the world. The view centered on beliefs of growth; in knowledge, in capital and in power. Great leaps have no-doubt been made in the generation of knowledge and science over the last few hundred years. However, some of the destructive legacies left by Imperialism-led-science are also clear (apartheid, weapons of mass destruction and global warming, to name but a few). In this context, movements began to emerge to decolonise knowledge and related political practices (see for example Creary, 2012). Regarding knowledge and decolonisation, Smith (2013) questions the validity of the very notion of 'research'. She writes how indigenous populations are treated as subhuman artefacts of inquiry and cognitive

dissection. We have come to disregard ancestral beliefs as myths of little worth. Additionally, our hunger for growth has led to humans exceeding the Earth's capacity to continue to sustain life due to climate change.

Regarding transport knowledge, western expertise is currently formed on the assumption that an ever faster and more reliable circulation of vehicles and people is desirable (Schwanen, 2018). This has spawned a plethora of urban development models to reach this objective, including Transit Oriented Development (TOD). Alternative approaches emphasise the need to measure accessibility to different locations, but overall seem to miss those impacts that transport brings beyond the potential for fast connections to core locations (Pereira, 2019). For example, Schwanen (2018) points out how most of the recent geographical research on transport in the Global South (Africa, Asia and Latin America), at best adapts pre-existing theoretical frameworks to empirical deviations from western norms. He proposes a dual strategy towards the decolonisation of knowledge about transport. First existing expert knowledge should be complicated, slowed down and disrupted. Second, new theories, concepts and methodological practises need to be brought into critical dialogue with each other. This strategy entails allowing established expert knowledge about transport to be contested from outside historically emerged centres of expertise. These last centres are usually found in the 'West'. However, the disruptive concepts might come from alternative sources, such as the "elderly in indigenous communities in Latin America" (Schwanen, 2018, pp. 5). This reflects a growing scholarship surrounding decolonisation for empirical studies in Latin America (Gerlach, 2017). In decolonisation the interpretation of Sumak Kawsay philosophy as 'Buen Vivir' has gained popularity, coming into academic debate, laws and even state constitutions (Gudynas, 2013). An example of the latter is the reforming of the Ecuadorian constitution in 2008. It was thought that Buen Vivir offered an opportunity for development paths to move beyond Western modern culture (Gudynas, 2011). However, it is still not clear exactly how we can work on the decolonisation of knowledge about transport (Schwanen, 2018), and this paper seeks to begin to address this.

Conclusions:

This article set out to add to the emerging academic discussion surrounding the decolonisation of transport knowledge. This was carried out through a reflection of Transit Oriented Development (TOD) through the lenses of Capabilities Approaches (CAs) and Sumak Kawsay philosophies.

TOD is widely praised as a solution for the development of sustainable cities, and has risen as a panacea for all our urban ills from green house gas emissions to legacies of apartheid in urban planning. However, it is debatable whether TOD improved living conditions for the urban population that fall outside of the wealthier strata of urban residents. Proponents of the methodology highlight the improvement to quality of life in areas that have received TOD investment. And yet, examining this through the lens of CAs calls us to question what improvements in life actually mean. CAs argue a person to have achieved a good quality of life if they have a freedom of choice to achieve that which is considered valuable. For example, it might be considered to be valuable to live within walking, cycling or transit distance from your child's school and one's own place of work (TOD style). It might also be considered of value to be able to study and work from home, which has a significant impact in reducing greenhouse gas emissions wherever you might live. We cannot help but to see this through the current light of Coronavirus restrictions, where living, working and studying from home suddenly became the global norm.

Additionally, in attempting to reach the decolonisation of knowledge we must question the very foundations of western thought. The concept of growth is an example of a mindset that we are wired into. TOD focuses on economic growth. CAs on personal freedom of choice. In contrast, Sumak Kawsay philosophies share a common ground in seeking to reach a balance between community, nature and the cosmos. As such, thinking through the lens of these indigenous philosophies questions the end objectives of TOD and CAs: economic growth and personal emancipation (through freedom) is not possible at the expense of nature and community.

Overall, an academic discussion of the commonalities and conflicts TOD, CAs and Sumak Kawsay quickly leads to a complication, slowing down and disruption of certain epistemologies underlying current Compact City

theory that is promoted for sustainable city planning the world over. Nevertheless, bringing new concepts and theories into circulation is necessary if we are to achieve true decolonisation of transport theory. Whilst there is no clear-cut methodology for this to date, contesting expert knowledge about transport from outside historically emerged centres of expertise inevitably plays a crucial role.

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Part III
Circular Economy: A Sustainable Solution for a Sustainable Future

Design experimentations for built environment's care

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Abstract

In view of necessary changes towards land use and buildings renewal, the research looks at the redevelopment of complex urban areas where different disciplines' contributions collide towards the circular reuse of spaces and buildings. In the 2018 Eurostat "Waste generation" survey, construction waste is an obvious burden in Europe and a priority theme for the European Circular Economy Action Plan, while the recent Waste Framework Directive set a target for 70% waste recovery by 2020. These issues are presented through the Italian case study of the city of Prato but making comparisons with innovative projects in Europe and beyond. The need to think about best suited strategies of reuse and regeneration before the formulation of fully defined projects is clear. Universities can guide the res publica to achieve these goals in complex contexts, also encouraging partnerships with private or public investors. Prato Municipality had the foresight to address the Department of Architecture of the University of Florence to obtain support from the academic world. The resulting design experimentations were necessary before intervening in a dense of overlap of productive, residential, and social fabric, and obtained the honourable mention from the Common European Sustainable Built Environment Assessment in the category of developing retrofitting projects in 2019. These processes can foster participation in Horizon Europe 2021-2027 calls in a sustainable vision that places cities like Prato in the European network of circular cities. Prato's urban plan uses building recovery as a tool for change supported by sociology, architecture, and art, based on the awareness that environmental sustainability can only take place if integrated with circular economy and urban resilience. The applied design experimentations aim to change traditional production-consumption-disposal processes into strategies of renew and recycle, from the material to the unfinished building to transform waste into a resource for the city.

Keywords

design research; environmental control; urban regeneration; sustainable development; public engagement

Built environment: an opportunity

In the year in which, in Italy, the Ministry of the Environment and the Protection of the Territory and the Sea changes its name to Ministry of the Ecological Transition with the law DL 22/2021, it is clear how relevant it is to speak of circular economy in cities and territories, of reuse of built heritage and energy efficiency. In particular, the themes of the built environment's care and the consequent improvement of the quality of life and the relationship between man and nature are central in this change of direction reported in this contribution.

The awareness of being in a finite system of resources has taken place at various levels throughout the world for several decades, but the application of the necessary measures is still under discussion because of conflicting interests in today's societies and by a naive, or deliberately superficial, confidence in the development of new technologies as a solution to the problem. The examples presented for the explanation of these issues are in the Italian context but turn their gaze to the rest of Europe by making comparisons with projects with significant results. The debate focuses on the overcoming of technicality in addressing the theme of the recovery of existing buildings and the 'implosion of cities' described by Renzo Piano (Vv. Aa., 2014). This question can be answered by the direct involvement of research institutes and universities in the preliminary phases of recovery interventions within the delicate systems of existing districts, among which peripheral, public residential and disused industrial ones stand out for their complexity.

Universities, namely places of innovation, can guide the res publica to achieve these common objectives in complex contexts, also encouraging the definition of partnerships with private investors or, as in the cases reported, with the contribution of public funding. The aim is the transformation of cities and landscape with an environmental and social approach (Rossi Prodi et alii, 2013) by using research methodologies in the field of architectural technology. Strategic design experiments, developed in collaboration between public administrations, universities, and managers of existing building complexes, should therefore be preparatory to the definition of urban

implementation tools and projects according to the theory of Urban Acupuncture (Lerner, 2014; Casagrande, 2014) but keeping a holistic vision of the urban system.

Final considerations and future developments

From analysis to design, design experiments create visions to present ideas in a stimulating but simple way: the potential of buildings and areas is revealed by transmitting, at an emotional level understandable to all, the feelings that you would experience in the place if reinterpreted. These qualitative results are useful for administrations to innovate and integrate urban planning tools and participate in European funding calls. From a financial point of view, measuring the feasibility of the intervention proposals will be the next step that will be developed with the disciplinary contribution of the economic evaluation of the project. An analysis of this type, already in the phase of project experimentation, can facilitate public administrations in proposing attractive opportunities for public-private partnerships, The aim is to promote sustainable environmental and social action.

The Intrinsic complexity of creating methods and standards for cooperation between scientific research and public administrations requires constant updating and innovation. The examples of collaboration described have been translated into fragile contexts both at urban, technological and social levels. The success of these interventions, the approach to design, theoretical and empirical research can be the basis for articulating and structuring a methodology for similar actions in Italy and Europe.

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THE CIRCULAR ECONOMY INNOVATION POTENTIAL BEHIND THE SCARCITY OF RAW MATERIALS - A LITERATURE REVIEW

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Abstract

Globalisation, climate change and scarcity of raw materials are key challenges of the 21st century. Most industrialised countries depend on raw material imports, as their domestic raw material deposits are smaller than their needs. Due to today's growing demands, the question arises “how the future supply of raw materials can be secured?” and “has the current shortage of raw materials already led to new innovations?”
The sustainability development goals (SDG) were created by the United Nations (UN) to ensure sustainable development by considering all three pillars of sustainability (ecological, economic and social). SDG No. 12 responsible consumption and production aims to ensure (United Nations and Department of Economic ans Social Affairs, 2021) that the needs of the present can be ensure without compromising the ability of future generations to meet their own needs. (Lebel and Kane, 1987: 41).
The Green Deal is on a European Level an integral part of the Commission's strategy to implement the United Nations 2030 Agenda and the SDGs. In the same context, the Committee presented an initial roadmap of the key politics and measures needed to achieve the European Green Deal. One of the various elements of the Green Deal is it to mobilize the industry for a clean and Circular Economy. (European Commission, 2019) A well-functioning and effectively implemented circular economy as well as the use of secondary raw materials can relieve countries, companies and customers from the risks of international raw material policies and thereby represent a reliable supply more econotmically. (European Commission, 2019).
For this reason, the authors decided on the topic of raw material scarcity and what innovation potential brings with it in the area of Circular Economy (CE) as the leading overall topic of the entire PhD project. The literature review aims to reveal how the attention and relevance of the Circular Economy in research has increased in recent years and how the innovation potentials arising from the scarcity of resources have already been investigated. To answer the main Question:
- Does raw material scarcity lead to greater innovation in the circular economy?

Keywords

Scarcity of Raw Materials; Circular Business Models; Circular Economy (CE); Cradle to Cradle; Circular Product Innovations; Closed Loop System;, Closed Loop Value; Closed Loop Economy; Circular Design; Circular Product Design

Introduction

There is only one planet Earth, yet by 2050, the world will be consuming as if there were three. (European Commission)

As the world´s population is expected to grow and will reach nearly 10 billion by 2050, (The World Bank 2018) the global consumption of materials such as biomass, fossil fuels, metals and minerals is is increasing while annual waste generation is projected to increase by 70% by 2050.(European Commission; Kaza 2018). Today's understanding of economic activity, which (Michael Porter 1985) explored in their Value Chain Theory (Barnes 2001), is based on the principle of the take make waste pattern. Companies extract materials, apply energy and labour to manufacture a product, and sell it to an end consumer—who then discards it when it no longer serves its purpose. (Ellen Macarthur Foundation 2013) It is not only research and science that have understood that this type of economic activity cannot continue in the long term without having an impact on our environment. Recent movements such as fridays for future[1] have generated much more attention for sustainable development. However,

[1] #FridaysForFuture is a movement that began in August 2018, after 15-year-old Greta Thunberg and other young

there has been environmental activism in the past, so it is nothing "new", but through these developments sustainability and CE has become salon capable. This trend is also a part of this literature review. The release of greenhouse gases has never been higher than in 2017, and the levels of carbon dioxide, methane and nitrogen have reached record levels and quadrupled since the 1960s. (Hartfield et al. 2018) As a result, the temperature of the earth and the oceans also reached the second highest level in 2017 since records began. (Hartfield et al. 2018) In 2020 we faced another year of records. (NOAA National Centers for Environmental Information, State of the Climate: 2021, retrieved on 2021) The years since 2014 were also the four warmest years since records began. (Hartfield et al. 2018) Climate Change, Energy & Fuel, Material Resource Scarcity, Water Scarcity, Population Growth, Urbanization, Wealth, Food Security, Ecosystem Decline and Deforestation (KPMG International 2012, S. 14) are considered to be the greatest sustainability challenges of our time, which will affect everyone in the future. The great hope is that the private sector together with other organizations and institutions can develop solutions that resolve the ecological challenges. This requires innovation approaches that bring about new technologies as well as new business models. (Bocken et al. 2019, S. 20) Balancing traditional economic goals with social and environmental concerns has created a new measure of corporate performance (W. McDonough and M. Braungart 2002). Therefore creating a sustaining industrial system in the new context is necessary to specify a new definition of quality in product, process and facility design. (W. McDonough and M. Braungart 2002). It can be called the next industrial revolution. Which is defined by McDonough & Braungart into equity, economy, and ecology:

Equity refers to social justice by taking responsibility for all people along the supply chain. It has to be ensured for example that all people involved in the value creation process have an appropriate standard of work. They should not be exposed to chemicals for example.

Economy refers to market viability. Intelligent designs and new business models can be a solution for challenges of the future.

*Ecology*refers to environmental intelligence. The new industrial revolution should also rethink materials and set new design criteria. (William McDonough and Michael Braungart 1998)

The main goal is to reduce all environmental impacts through eco-efficiency based methodology which looks at each step of the product, process or service's life cycle, in order to design or redesign these with less impacts (Beaulieu, Luce & Durne, Gabrielle & Arpin, Ml. 2016) and at the same time to limit the consumption of resources leading to only as much is taken as the world can represent. As defined in the Brundtland Commission Report (Our Common Future), sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. (Lebel und Kane 1987, S. 41) The triple bottom line, a concept developed by (Elkington 1998) is defined by the principle that the ecological, economic and social pillars are considered equally important in everything a company does. Economies will benefit from substantial net material savings, mitigation of volatility and supply risks, positive multipliers, potential employment benefits, reduced externalities and long-term resilience of the economy (Ellen Macarthur Foundation 2013) A widely discussed sustainability strategy in this context is the CE as a way to overcome the current production and consumption model based on continuous growth and increasing scarcity of resources. By promoting the adoption of closing-the-loop production patterns within an economic system CE aims to increase the efficiency of resource use with special focus on urban and industrial waste to achieve a better balance and harmony between economy, environment and society (Ghisellini et al. 2016, S. 11). But an implementation of a CE requires the full mobilisation of all industries. It takes 25 years to transform an industrial sector and all the value chains. To be ready in 2050, decisions and actions towards a sustainable and circular economy need to be taken in the next five years. (European Commission 2019) To fulfil this ambition the EU needs to accelerate the transition towards a regenerative growth model that gives back to the planet more than it takes, advance towards keeping its resource consumption within planetary boundaries, and therefore strive to reduce its consumption footprint and double its circular material use rate in the coming decade (European Commission).

Conclusion

In this section, the potential of the scarcity of raw materials leading into new circular economy innovations will be evaluated. The circular economy is the attempt to achieve both economic growth whilst minimizing resource use. (Wiebe et al. 2019, S. 28). After the systematic scanning of the articles, the basis is now set on which the research article will be processed in depth. A deeper knowledge of the circular practices is essential to identify which

activists sat in front of the Swedish parliament every schoolday for three weeks, to protest against the lack of action on the climate crisis. She posted what she was doing on Instagram and Twitter and it soon went viral. Fridays For Future 2021.

practices are currently being performed and which still need to be implemented or improved (Munaro et al. 2020, S. 2) As been seen in the content analysis, current researches have not really been considering the potential of the scarcity of raw materials as a potential for CE. However, aspects like waste reduction and the carbon footprint were frequently mentioned as reasons for the introduction of CE. Even though Europe has a consistently higher consumption of embodied materials than extraction of materials, but overall the smallest share in the world, especially regarding metals. (Wiebe et al. 2019, S. 25) By this, a research gap has been identified. Barriers and obstacles to the introduction of the CE and new innovations as mentioned above have also arised.(Bernard und Ryan 2009, S. 18) However, benefits coming from the implementation of CE within companies are not always clear to managers. (Rosa et al. 2019, S. 940) That is why future research should also include how companies can implement CE and what kind of hurdles are there to overcome during implementation. New innovations are needed, which include systems thinking, mindset change, diversity, effectiveness, resilience and long term strategies for all stakeholder approaches. (Rossi et al. 2020) Upcoming research work should also include why resource scarcity has played a subordinate role in the past. Furthermore, the question arises as to which of the above-mentioned business models can counteract the impending scarcity of resources and whether there are already practical examples based on it. Also, the consideration of why resource-intensive companies have not yet intensively dealt with the introduction of CE models should be paid attention to. Additionally, the aim of a tendency which raw materials will become scarce in the future, as well as a consideration of potential substitutions also couldn't be made.

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Barriers and Enablers to a Circular Economy Transition in Small Island Destinations: The Case of the Orkney Islands

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Abstract

The tourism sector is often the main socio-economic activity for islands (Sheldon, 2005) whilst also representing a source of negative impacts (e.g., Briguglio & Briguglio, 2002). As a response, the circular economy (CE) is rapidly entering the tourism agenda as a promising approach to the sustainability of small islands (Girard & Nocca, 2017). Yet, the transition to a CE is not without challenges that should be understood to inform planning. While the literature provides an overview of these disablers and enablers (e.g., de Jesus and Mendonça, 2018), this is largely based on *one-size-fits-all* approaches. Contributions are therefore limited when it comes to small island destinations (SIDs) where methodologies should be context-based with an understanding of the relationship that exists between *islandness* and the CE. Given the dynamism of the CE (Tapia et al., 2019), *islandness* is understood by the author as a spatial-geographical reality (Fernandes & Pinho, 2017). Accordingly, this short paper builds upon a *work-in-progress* doctoral project that investigates the tourism sector transition to a CE and the hampering/facilitating role of the spatial-geographical *islandness.* The research's key thesis is that islands require tailored approaches given their often physical/digital isolation, regional fragmentation and boundedness, and the smallness of their territories. The paper introduces preliminary findings that will – as the research progresses – develop into a working framework delineating a territorial understanding of the CE transition in SIDs. Such a framework would potentially benefit tourism planners towards the promotion of a CE in small islands. The researcher adopts a case study and qualitative research approach by conducting the study in the Orkney Islands, Scotland.

Keywords

Circular Economy; Tourism; Small Island Destinations; Sustainability; Islandness

Introduction

A fundamental transformation in the economic system is needed (Steffen et al., 2007; Galaz et al., 2008) as it is strongly suggested (e.g., Howes et al., 2017) that we are not close to environmental sustainability. The tourism sector inevitably contributes to these global concerns. In fact, while it generates significant benefits for destinations (Hall, 2007) it also leads to dramatic negative impacts (Hall & Lew, 2009). These negative effects of tourism are mainly rooted in the *linear* economic approach or *take-use-dispose* management of resources that currently characterises – largely - the tourism industry (Manniche et al., 2018). Consequently, the need to re-think the sustainability of tourism operations is essential and the circular economy (CE) seems to be a promising framework to guide this process as it provides practical guidance to resource valorisation (e.g. Manniche et al., 2018).

This short paper - based on a *work-in-progress* doctoral project - draws upon this broad requirement to re-think the sustainability of tourism operations. This discussion is particularly relevant for small island destinations (SIDs) where tourism impacts are often more acute (e.g. Seetanah, 2011; Luchman et al., 2012) and where specific territorial features, such as small size, isolation and scarce resources (Sheldon, 2005) call for tailored sustainable tourism strategies that capitalise on local strengths and weaknesses emerging from these specific islands' features.

Yet, the literature tends to neglect the role of the islands' territorial characteristics in hampering and/or facilitating the tourism sector's adoption of a CE. As a response, this study seeks to provide an understanding of

how SIDs' contextual issues – conceptualised as *islandness* - expresses barriers and enablers to a CE. Thus, the relevance of the study mainly lies in its potential to inform planners in designing customised solutions facilitating the sectoral transition to a CE in small islands.

Drawing upon a qualitative study approach in the Orkney Islands, the research investigates:

a) the factors that drive the implementation of a CE in the Orkney Islands' tourism sector.

b) the challenges and enablers to the adoption of a CE in the Orkney Islands' tourism sector.

c) and the ways islandness affects the transition to a CE in the Orkney Islands tourism sector.

Having defined the problem that this study seeks to address, the following section reviews the literature, both, from a conceptual and empirical perspective.

Conclusion

This work-in-progress study – by presenting some preliminary findings - suggests that a CE in SIDs must be driven by an understating of territorial dynamics in contrast to the *one-size-fits-all* strategies that currently dominate the literature. In fact, the nature, intensity and feasibility of resource flow in a CE depend upon the territorial conditions of the region and we should be concerned about how we capitalize on the enablers and mitigate the barriers to a CE. This appears to be especially important for island regions, representing complex systems and different expressions of islandness. The study is also showing that Covid-19 is playing a role in enabling as well as hampering the transition towards a CE. Yet, while the research sheds light on the broad range of enablers and barriers, future research may narrow down the investigation to the application of specific circular business models.

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Development of new bio-based materials derived from Sicilian agri-food industry waste

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Abstract

Green building is gaining momentum driving an ever-growing demand for sustainable and healthy building materials that keeps doubling every three years and which is expected to reach $377 million, globally, by 2022, according to recent studies. The European Green Public Procurement (GPP) policies, the rapidly dissemination of the green building rating voluntary programs and the increasing attention on reducing our dependency on raw materials through the principle of the circular economy, are among the key drivers that are transforming the market landscape. As a result, the need for bio-based, sustainable building material solutions has increased remarkably. In such context, this article will present the initial outcome of the ongoing research project which has been undertaking with the aim of investigating the possibility of creating new products from the bio-based materials derived from the waste of the agri-food production, typical of the territory of the Sicilian Mediterranean. The project's focus on the environmental sustainability will be pursued through testing and application of new biomaterials and components aimed at improving the quality of human life, with a particular emphasis on sensorial aspects and technology transfer. The initial objective was to identify potential agri-food waste material streams to regenerate and transform in valuable resources. Almond shells, hazelnut shells, Sicilian dried fruit were considered among the waste resources currently discarded by the Sicilian industry. A variety of processes were considered to shape new bio-based materials and test their performances and potential applications. Qualitative and economic aspects were evaluated in order to exploiting ways to enable the transition towards a regenerative supply chain and activate economic opportunities within the Sicilian territory and beyond. Considerations on the possible impact of the novel materials on health and wellbeing of the building occupants were also embedded into the investigation process.

Keywords: *Waste, biomaterial, circular flow, reause, recycle, sustainability*

Circular economy for sustainable development

A well-established paradigm nowadays is the "circular economy", from the simple combination of the use of raw materials that identifies a production, a use and a waste, we go from production to use, collecting the waste and recycling it in order to reuse it. The mechanism of the linear economy provides for the infinite use of raw materials, but the concept of circular is precisely in the fact that the material is not extracted but reused as the extraction of new materials is no longer sustainable in any field of innovation. The commitment to the mitigation of these risks and the search for new tools to ensure an efficient use of resources has led organizations to undertake innovative paths by approaching in a different way the issue of sustainable use of resources, through an ever decreasing waste and waste disposal and an increasing reuse in new production processes. A technical and scientific opportunity for environmental sustainability in various sectors is now the implementation of the circular economy, identified as a centripetal driver of innovation. So an agricultural company, or a company of building materials are able to participate in this sustainable project by enhancing the value of waste materials by giving new capacity for technological and innovative use. In this general framework focuses on the research of the reuse of waste from food production in innovative and sustainable materials, which can be revitalized in a new form and function that can be reconfigured as necessary materials for development.

Conclusions and implications

Sustainable and recycled building materials are beginning to move the world of green building and design in the field of green architecture, thanks in part to European policies on green public procurement (GPP), the rapid spread of voluntary green building assessment programs, and the growing focus on reducing our dependence on raw materials through the principle of the circular economy. In a world that is increasingly focused on energy and the use of recycled raw materials, the decision to go for the reuse of agro-food production waste is a potential focus for new products and consumer elements, as well as elements for contemporary or historic buildings. The driving process of circular economy is the possibility to reuse the waste of materials or natural elements that until today are eliminated, so the research has set itself the goal of reusing the waste of agro-food production of Sicilian dried fruit. The experimentation proposed has given the result that the rebirth of this material, the waste from the

production of dried fruit, using natural and homemade binders, is possible. This opens a number of possibilities for the reuse of all those biomaterials that are currently discarded without reintroducing them into the market. The research can be extended to all agro-food production waste, reflecting on the concrete possibilities of eliminating all waste to reconfigure it as a new material for many fields of work, and this can be done in many research contexts as the set of solutions to revive a waste embraces many different fields of work all projected to obtain the same sustainable result.

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The 'Human sphere' and the Figure of 8 as the Enabler of Circular Economy in Developing Countries: A Case Study.

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Abstract

Circular Economy (CE) models offer an alternative to linear production processes that lead to resource depletion, waste management problems and environmental degradation. This is particularly true for End of Life Tires (ELTs), which at the end of their use in the automobile industry are generally burnt or dumped. The use of whole ELTs in civil engineering can be a successful, low cost application. This is especially relevant for emerging economies, and in this context a case study was carried out through the construction of a gravity retaining in Llano Chico, a low-income urban area of Quito, the capital of Ecuador.

The transformation of whole ELTs into a raw construction material required nothing more than human ingenuity, making the most of the ELT's inherent mechanical properties. In addition, the loops of the technical and biological spheres of the common CE "butterfly diagram" were critically assessed. In the case study, the ELTs were cycled through the technical sphere in a collection and recycling process. The humansphere processes transformed the ELTs from being a waste product into a retaining wall. However, once constructed, the retaining wall from ELTs serves as a matrix for local flora to take root. This is in stark comparison to a traditional concrete retaining wall, which has little ecological value. The end point of the ELT wall is its incorporation into the environment, where its cycle ends in the biological sphere.

The authors argue that the technological and biological spheres of CE do not always function as two independent cycles. The humansphere can link the two loops, drawing tires through one sphere and into the other. This is a newly defined, "figure of eight" cycle.

Keywords

Participatory circular economy; community driven CE; "Humansphere"; ELT management; CE in developing countries.

Introduction

The extensive use of natural resources since the rise of industrialization in the mid-eighteenth century has led to environmental degradation (Wit et al., 2018). Worldwide, 92.8 billion tons of resources are used annually and only 9.1% of this use is circular whilst the lack of material management at end of life (EOL) accounts for 67% of global greenhouse gas emissions (Wit et al., 2018). Additionally, uncontrolled landfilling has negative impacts on population health and the environment (WBCSD 2010).

A circular economy (CE) is essential to promote efficient production and sustainable consumption (EC, 2014; EC, 2015). The Ellen MacArthur Foundation (EMF, 2013) defines a circular economy as "an industrial system that is restorative or regenerative by intention and design" (Pag.8)., Kirchherr et al. (2017) analyse the concept in the realm of scholars and practitioners. The review of over 114 definitions concludes that the CE embeds at its core the concepts of reducing, reusing, recovering, remanufacturing and finally recycling materials in the different processes of the supply chain: production, distribution and consumption.The review highlights that the CE concept can operate in different realms: companies, industries, cities and regions.

Transitioning to CE is a highly complex process which requires diverse but consistent routes of action involving changing new business and market models, policy frameworks as well as consumer behaviour (EC, 2014; Wit et al., 2018). A number of countries, cities and organisations have developed CE route maps and strategies to transition towards the CE. These strategies address ways to ensure efficient use of resources, promotion of cycling opportunities and strategies to restore natural capital. Within those, Extending Producer Responsibility schemes have played an important role. In most cases they involve a financial responsibility of end of life products and systems to take-back or recover products, with aim to promote reuse, and recycling and prevent pollution from inadequate treatment of waste products (Preston & Lehne, 2017).

In developing and emerging economies, implementation of Circular Economy policies faces several important barriers. Often waste regulations are weak and infrastructure for waste collection, treatment and recovery is to a large extent lacking (ETRMA, 2011; Toffel, 2003). While the CE model is based on increasing the circularity of the flows of biological and technical materials, it is important to acknowledge the social, policy and infrastructural dimensions that shape the flow of resources. It is also important the role that the informal sectors play in waste management processing (Preston & Lehne, 2017).

An example of wasteful use of resources is scrap tires. Every year an average of one-billion tires reach EOL and nearly four billion are in landfills and stockpiles worldwide (WBCSD 2008). The objective of this work is to explore the role of the human component (humansphere) in enabling CE practices. We do this through an analysis of how material, energy and human contribution interact and shape End of Life of Tires (henceforth ELTs) in a developing country through a case study in Ecuador. Based on this, a new conceptual framework is put forward that is appropriate for the humansphere in relation to the realities faced by the Global South.

Conclusions and Recommendations

Circular Economy (CE) models offer a powerful alternative against linear production processes that lead to resource depletion, waste management problems and environmental degradation. This is particularly true for End of Life Tires (ELTs), which at the end of their use in the automobile industry are generally burnt or dumped. CE innovation includes the breakdown of ELTs to being a granulated rubber, or even to their core materials. However, this entails a high-energy expenditure and certain environmental impacts. As an alternative, the use of whole ELTs in civil engineering applications can be a successful, low cost alternative. This is especially relevant for emerging economies, and in this context a case study was carried out through the construction of a gravity retaining in Llano Chico, a low-income urban area of Quito, the capital of Ecuador.

The transformation of whole ELTs into a raw material for civil engineering works required nothing more than human ingenuity, looking at the ELTs from a different perspective regarding their inherent base mechanical properties. In this sense, the humansphere currently at the frontier of CE thinking was highlighted. In addition, the loops of the technical and biological spheres of the common CE “butterfly diagram” were critically assessed. In the case study, the ELTs were cycled through the technical sphere in a collection and recycling process. The humansphere processes transformed the ELTs from being a waste product into a retaining wall. However, once constructed, the retaining wall from ELTs serves as a matrix for local flora to take root. This is in stark comparison to a traditional concrete retaining wall, which has little ecological value. The end point of the ELT wall is its incorporation into the environment, where its cycle ends in the biological sphere.

Overall, the case study invokes the need for further research into CE practical applications in low-income communities in emerging economies. Additionally, it calls us to critically assess the loops of the technological and biological spheres in current academic debate surrounding CE. This article argues that the case study highlighted the importance of the human sphere in drawing out the potential of End of Life Products (ELP), without necessarily having to radically change those products through energy intensive industrial processes. Furthermore, the observation is raised that the technological and biological spheres do not always function as two independent cycles. The humansphere can link the two loops, drawing tires through one cycle and into the other. This is a newly defined, “figure of eight” cycle.

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Nature Based Solutions: lessons learnt from 3 case studies spanning cocoa production with forest landscape restoration, mangrove restoration and the fishing industry in marine systems.

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Abstract

Within the discourse of sustainability and sustainable development, Nature based Solutions (NbS) was developed by the International Union for the Conservation of Nature (IUCN). The concept was put forward in the IUCN and United Nations Framework Convention on Climate Change (UNFCCC) Position Paper in 2009, and has been gathering strength ever since. A formal definition was agreed on in 2016 and an international standard given in 2020, based around eight criteria to determine how strong or weak an application of NbS is.

This article looks at findings of three case studies from Peru, El Salvador and Ecuador, where results highlight how many win-win situations can be achieved for the project, nature and society.

Nevertheless, the study also shows how far NbS still has to go. We are currently only able to skim the surface in our complex systems and interactions found in nature. It is therefore difficult to design a NbS project, when we understand little of the implications of the solution that is being applied in the complex system within which it operates. It is a call to the academic community to continue studying ecosystems and their interactions.

Keywords

Nature based Solutions; Forest landscape restoration; Ecosystem-based adaptation; Integrated water resources management.

Introduction

Within the discourse of sustainability and sustainable development, Nature bases Solutions (NbS) has multiple definitions in circulation to date. Among them, the concept of the International Union for the Conservation of Nature (IUCN) and the European Union (EU) stand out. On the one hand, the EU in the Final report of the Horizon 2020 expert group on "Nature-based solutions and re-naturing cities" conceptualizes NbS as follows:

> They are actions which are inspired by, supported by or copied from nature. Some involve using and enhancing existing natural solutions to challenges, while others are exploring more novel solutions, for example mimicking how non-human organisms and communities cope with environmental extremes. (European Commission, 2015, p. 5).

The European Union (2015) also points out that the NbS use the characteristics of complex processes of nature to achieve the goals set, in this vision it is highlighted that maintaining and improving natural capital is of crucial importance when implementing strategies such as also the efficient use of resources together with resilience to change and adaptation to local conditions. In this conceptualization, the objective of NbS according to the European Union (2015) is to help societies face environmental, social and economic challenges in a sustainable way.

On the other hand, the IUCN defines Nature based Solutions as "actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits." (Cohen-Shacham, Walters, Janzen, & Maginnis, 2016, p.5). The same authors argue that their main objective of the NbS is to safeguard human well-being and address social challenges such as: food security, climate change, water security, human health, disaster risk, social and economic development;

so that the actions and proposals that contemplate this concept reflect social and cultural values and at the same time improve the resilience of ecosystems, their capacity for renewal and provision of services.

The concept of the EU and the IUCN is based on a common objective that is to face the challenges of today's society and at the same time achieve benefits for both human beings and nature, together with the vision of maintaining and improving natural capital. The definitions differ when it comes to expressing which actions can be taken into account as NbS, in the case of the IUCN they are actions to protect, sustainably manage and restore natural or modified ecosystems and provide benefits to human wellbeing and benefits for biodiversity. Therefore, for a project to be considered an NbS by IUCN, it must work with solutions that involve a better use of ecosystem services or solutions aimed at managing or restoring ecosystems or creating new ecosystems. On the other hand, the conceptualization of the EU refers to the fact that NbS are actions which are inspired by, supported by or copied from nature, which allows solutions that do not necessarily produce a net gain to biovidersity to be considered as NbS. Exemplifying this situation, we speak of a construction inspired by a termite nest for which energy expenditure is optimized, if the EU concept is considered this is a NbS but if the IUCN definition is considered this is not a NbS due because it does not promote benefits for biodiversity. The two conceptualizations are correct and necessary to promote sustainable development today, but when designing a project, the context and landscape on which the project is developed is a decisive factor when choosing a conceptual direction. mentioned above, it is observed that the conceptualization of the EU is more appropriate for territories that have modified their natural state for the most part, such as cities, while the IUCN concept is recommended for projects that are developed in territories that still retain their natural characteristics.

This document works with the IUCN conceptualization of NbS. This concept was presented in 2019 within the position paper on the United Nations Framework Convention on Climate Change (UNFCCC) COP 15, for 2012 the IUCN formally adopted the concept and became part of one of the three edges of the IUCN Global Program 2013-2016 (Cohen-Shacham, Walters, Janzen, & Maginnis, 2016). The concept of NbS appears in documents of other organizations throughout the first decade of this century, such as the World Bank report of 2008, but it was not until 2015 that the concept took hold in the scientific literature (Cohen-Shacham, Walters , Janzen, & Maginnis, 2016). In 2016, IUCN launched the book Nature-based Solutions to address global societal challenges, which establishes a formal definition for NbS along with eight principles of NbS with the aim of promoting the implementation of these strategies.

These principles are: 1. embrace nature conservation norms, 2. can be implemented alone or in an integrated manner with other solutions to societal challenges, 3. are determined by site-specific natural and cultural contexts that include traditional, local and scientific knowledge, 4 . produces societal benefits in a fair and equitable way, in a manner that promotes transparency and broad participation, 5. maintain biological and cultural diversity and the ability of ecosystems to evolve over time, 6. are applied at a landscape scale, 7. recognize and address the trade-offs between the production of a few immediate economic benefits for development, and future options for the production of the full range of ecosystems services and 8. are an integral part of the overall design of policies, and measures or actions, to address a specific challenge (Cohen-Shacham, y otros, 2016).

Establishing a treatise with the formal definition and the principles of NbS constituted a breakthrough for the definitional framework. This process was consolidated with the development of operational parameters and thus the IUCN Global Standard for nature-based solutions was born in 2020, which seeks a common understanding and interpretation of the NbS concept along with quality controls for design and implementation. of projects (UICN, 2020) , which will increase confidence in NbS for decision makers and investors. In turn, the Standard provides a guide for the design, improvement and evaluation so that projects that implement NbS achieve the desired results and also seeks to reduce the risk that actions that harm biodiversity are considered as NbS (UICN, 2020).

The IUCN Global Standard for nature-based solutions is a broad concept that allows standardizing the design and implementation of NBS without neglecting the characteristics of the specific context, participatory processes and the various factors that impact on social challenges (UICN, 2020). The Standard is made up of eight criteria based on the principles of NbS and each criterion has specific indicators, these are listed below:

- Criterion 1: NbS respond effectively to social challenges.

- Criterion 2: The design of the NbS is adapted to the dimension.

- Criterion 3: NbS result in a net gain in terms of biodiversity and ecosystem integrity.

- Criterion 4: NbS are economically viable.

- Criterion 5: NbS are based on inclusive, transparent and empowering governance processes.

- Criterion 6: NbS provide a fair balance between achieving their main objectives and the constant provision of multiple benefits.

- Criterion 7: NbS are managed adaptively, based on data.

- Criterion 8: The NbS are sustainable and are integrated in an appropriate jurisdictional context.

The criteria set out above support the development of methodological tools to strengthen the focus of projects within a specific thematic framework, with the objective that more projects on a global scale take NbS into account.This article sets out to answer the research question: “What happens when the NbS standard is put into practise?”

It does this by examining three different case studies that were selected 1) due to them being projects that were carried out within the NbS paradigm, and 2) because they had three different ecosystem-related approaches based on the project type and circumstances. By offering some insights into NbS being carried out in reality, the authors hope to enrich current academic debate and offer possible lessons learnt for practitioners seeking to embark on new projects in the field.

Conclusion

The IUCN NbS concept is useful to address development challenges such as climate change, risk management, water and food security, but when we talk about sustainable urban development and taking into account that this challenge has a place mainly in places where most ecosystems have already been modified the concept of the EU allows generating more accurate project guidelines for urban contexts. In contexts where ecosystems have not become urbanized, the IUCN concept better addresses the complexity of these territories and its main challenge is to integrate public policy projects that address the needs of both ecosystems and human beings that they inhabit them. It is important to highlight that the ecosystems to be protected, managed in a sustainable way and restored coexist together with socio-spatial characteristics so complex that they require transdisciplinary solutions and from multiple approaches, where the important role of ecosystems is recognized and how they can address different lines of action within these territorial dynamins, which also generally produce multiple benefits due.

The second challenge that is identified is the delimitation of the scale of the landscape in the projects, since the ecosystem interactions do not recognize the geographical limits and for years the development of projects has exclusively recognized these delimitations, which does not allow to see the complete perspective of the situation of the ecosystem as such. Implementing projects that recognize this need is a positive guideline for the creation of new initiatives that address the real scale of the various problems faced by ecosystems and generate mediation mechanisms and collaborative work on a national and international scale.

NbS is a relatively new concept, so academic efforts to understand ecosystems and document these projects that apply its principles are a fundamental element to disseminate this successful way of implementing initiatives on ecosystems that need to be protected, restrained in a sustainable way and restored. The verification and dissemination mechanisms allow the community to recognize successful experiences, identify possible problems and also recognize guidelines and technical treaties to implement these principles that allow generating net gains for biodiversity and human well-being simultaneously.

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Part IV
Reimaging Cities, Territories and Landscapes

Turning urban streets from infrastructures to living places
Early research outcomes of a case study in Prato, Tuscany

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Abstract

During the second half of the Twentieth Century heavy phenomena of infrastructural development have affected urban landscapes. With regard to the streets, hosting the growing fluidity and speed of motor vehicles fluxes has been a priority for most designers. Nowadays there are multiple driving forces towards a transition that could accomodate different uses within the streets, primarily the cultural, social and economic exchanges that streets could enable in the past and have progressively lost.

By the spreading practice called “shared street” most signage and traffic lights can be removed to host a self-regulated and spontaneous circulation of all users and vehicles. This paradigm is being discussed with regard to its potential in strengthening urban landscape identity, ensuring accessibility, redefining uses and practices within the street, reducing injuries and misbehaviours, offering real and perceived safety to all users.

“Back to the street” is an ongoing research by design dealing with strategies of integration of different kinds of urban streetscapes. Which design features are needed to encourage a change in attitude, speed, hierarchy for street users? How can these features positively affect urban landscapes in general and streets liveability primarily?

We propose the case study of San Paolo street in Prato (Tuscany) presenting a set of quality requirements for street design such as plants integration, water drainage, comfortable paths for both cyclists and pedestrians.

As the design for separate flows cannot fulfill all quality features in San Paolo street, mostly due to its varying width, we assume the “shared street” can replace it for enhancing collective life within the streets while promoting the local sustainable mobility. The research is investigating two options: sharing the street in the narrow stretches or along its whole length. A preliminary comparison is proposed to discuss the earlier outcomes of research.

Keywords

*Landscape design; Urban streets; Shared streets; Accessibility; Liveability**Introduction**intorduction*

The widespread distribution of cars as prevailing private means of transport since '50s have entailed significant transformation to landscapes, and mostly to cities. These changes primarily concerned the streets, as places addressed to vehicles transit, but have consequently concerned several aspects of the urban life. Habits have changed with modes of transport, for example reallocating commercial, working and leisure activities outside the settlements (Bohigas, 2007; Capuano, 2020).

As Sylvia Crowe (1960) had foreseen, the need for a faster transit has radically changed the way people use streets, thus resulting in the loss of many advantages for the social, cultural and economic exchange, and so in the contradiction of cities' primary function: to be a place in which to live. So, while cities' dynamics have being deeply analyzed by architects, urbanists, economists and sociologists, some authors started to focus their interest on streets as crucial elements of collective urban identity. Despite many differences among perspectives and key issues, starting from the '60s a debate is fostered on the relational, multiscalar and multifunctional role of public spaces and particularly of streets. While Lynch (1960) underlies the importance of legibility and identity of space, relating to memory and orientation trough streetscapes, Cullen (1961) and Alexander (1977) read the streets as coherent sequences of frames. At the same time, Appleyard and Lintell (1972) analyze the consequences of traffic increase on outdoor activities and Gehl (1971) starts its still ongoing studies on the social dimension of urban streets focusing on uses in relation to their morphological, material and functional qualities. A new way of interpreting urban streets gradually emerges, looking at people's emotional and sensory experiences as quality features for changing urban landscapes in search for a new spontaneous and awakening social process, where streets take on a metaphoric and cognitive meaning (Rykwert, 1982).

Nowadays, after around seventy years of cars moving through cities, problems of conflicts, injuries, pollution and places' identity have considerably increased, depleting the liveability of urban open spaces, peoples' health and social equity (Illich, 1981). Growing traffic flows and the suggestion of speed as a major means of freedom

have reshaped our proximity (Smets, 2007) and detached our bodies from the ground (Pavia, 2020). As the lanes increase in number and width and the spread of parking areas have become new parameters for cities' transformation, the liveable space within the streets has been significantly reduced. The expansion and densification of cities' infrastructures and the combustion of fossil fuels is also causing a severe quality decline for air, water and soil, affecting not only the ecological functioning of natural systems, but also indirectly the quality of life for humans (EEA, 2017).

The awareness of need for a change in attitude is widely shared among the scientific community and the public authorities, and most cities around the world are moving towards a new understanding of urban mobility systems. Contemporary visions are emerging where pedestrians and cyclists have priority over motor vehicles and public open spaces are designed to host a wide range of activities and convey a sense of place and wellbeing. Sustainable mobility is being included in city planning theory and practice as a multilayered strategy for citizens' health: it reduces air pollution, produces enhancement of people's lifestyle, promotes physical activity, helps social interactions and little economies. Walking is an inherent activity trough which humans learn and discover since their early appearance in the world. It is also a medium for connecting with objects and other people. Furthermore cycling enables a freedom of movement and an impromptu use of space that no other means of transport can offer except one's feet.

As in urban streets the vehicles' average speed equals the bicycles', exceeding by only 2 km/h pedestrians' during traffic congestion hours (Fiorillo et al., 2018), cycling even turns out as the most efficient means of transport in the urban realm.

The plan for pedestrian and cycle mobility deals more with the research on places' identity than with the infrastructural arrangement for slow transit fluxes (Furtlehner, Licka, 2019). Therefore sustainable mobility can become a playful practice, an active experience where the physical space can take on a symbolic meaning and strengthen the awareness and joy of belonging to the urban community (Panzini, 2020).

Since the main Buchanan's work "Traffic in Towns" (MoT, 1963) brought to light the need to face the problem of cars in cities many contributions have been given both in the scientific discourse and in the professional practice on this issue. The design for sustainable mobility has become relevant, trying to figure out which quality features are needed to encourage walking and cycling and enhance places' identity in cities while reducing the danger produced by vehicles. Different approaches have emerged to accommodate by design all functions required to streets in this perspective. Among others "woonerfs", term first coined in 1965 by Niek de Boer, refer to residential areas where vehicles conform to pedestrians and cyclists rules, "complete streets" emphasize the need for a comprehensive design for users of all abilities and with all kind of transport. Besides, in Mark Francis theory (2016) "democratic streets" deal much more with the concept of collective use and social equity, and "shared streets", as promoted by Hans Monderman, concern the removal of signage for a self-regulated sharing of space among all users and vehicles.

An insight of this last approach is provided to better understand its implication in landscape design.

Discussion and open conclusions

The two options show different solutions that could both contribute to improve the urban landscape in terms of accessibility, micro-climate, hydrology, identity; ultimately enhancing resilience, well-being and sustainability. With regard to the early outcomes above mentioned we propose some general arguments:

In option 1, the presence of an actual vehicular lane, should not allow cars to exceed 30 km/h, due to the often changing spatial configuration that alternate the shared and the separated fluxes layout. However we could consider that the streetscape itself can suggest such a behavior without imposing restrictions. In fact the succession of different levels acts as a speed bump. So we can assume that the two options don't show any differences in terms of vehicles speed.

Option 1 results in frequent changes in landscape scenery and use, that could cause disorientation in users. However, this could positively affect a less fragmented street, producing interesting differences within a more homogeneous landscape.

Flows separation in option 1 requires more space for transit, depriving the street of many other uses and components, including parking lots, permeable soil and vegetation features. This sometimes can prevent the landscape from achieving a widespread adequate quality level. Furthermore the citizens' frequent claim for parking lots could generate opposition to such kind of transformation, even if it could represent an opportunity for reallocating them elsewhere away from the streets, for example inside buildings.

Options 2 allows a general and better integration among all street components that generate a widespread landscape quality. Since we assume it is better to avoid a sectoral and partial approach to design in order to

achieve an higher efficacy for the project, we would recommend option 2 for via San Paolo and in general for streets which show similar spatial and functional features. Nevertheless, as the “shared street” layout can't be implemented in the whole city's network of roads, it could be useful to evaluate hybrid solution such in option 1 to trigger a transformative process where different solutions can fit the diversity and hierarchy of the streets in the urban landscapes.

In conclusion it is worth looking deeper into the shared street layout to better understand its potential in enhancing urban landscapes, promoting the integration of different uses and components of road networks, encouraging people to come “back to the street”. In fact, as it results in this design experiment, the shared street can be a solution to provide much more space for non-transit activities, to generate places where to grow proximity relations among citizens, and this is mostly valid in narrow streets. In order to develop a transition towards a more sustainable urban environment it is necessary to overturn the current paradigm where motorized transit influences and often undermines people's freedom of movement. For enhancing sustainable mobility streets should be more attractive and pleasant, and vegetation plays an important role in this strategy. As the above mentioned results show, the shared street layout often allows the presence of a wider vegetal system within the streets, even where the ordinary layout reveals a lack of space. Planting trees along the road network is notably important for the connectivity and the ecological efficacy of the urban vegetal system, which can positively affect not only the beauty, health and micro-climate conditions of the city, but also the environmental quality at wider scales. However while for these reasons the shared street seems to be a proper transformation for some kind of urban streets, a few critical issues must be still widely discussed, such as the real and perceived safety for visually impaired people and the need for notifying a change in mobility rules from one place to another, which could be a driver for users' disorientation and confusion. As the shared street precondition is the absence of rules and the informal self management of people's activities, we argue it is the landscape, as designers conceive it, that should address this critical issues, conveying a sense of place where people are induced to behave in a respectful and safe way and share their public space without conflicts.

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The potential of multi-located work for research: From Covid-working to distributed university campus

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Abstract

Academics are a peculiar category of knowledge workers whose work, by nature, lacks predefined time and space and includes individual and collaborative activities. Over the past decades, academics have progressively evolved their typically university-centric way of working towards a hybrid, spatially distributed model that includes home and third spaces. The spread of the Covid-19 pandemic has accelerated the redrawing of the geography of workspaces for academics and it has opened opportunities to enable creative and innovative ways of working as well as more sustainable spatial patterns throughout the territory. Indeed, working from *other spaces* than the official workplace can not only have positive impacts on productivity, creativity, and collaboration, but also increase the attractiveness and inclusivity of university campuses by proposing a campus model that is spread across the territory and integrated with it. While there are already some cases where university campuses accommodate coworking spaces, libraries and innovative hubs within them, evidence of academics using *other spaces* off-campus is scarce. This research investigates whether and to what extent the use of off-campus spaces by Italian academics is a likely and desirable prospect for the future, based on how much their way of doing research has evolved during Covid-19 pandemic. A descriptive analysis of data collected through a questionnaire distributed among Italian tenured academics is presented. Results describe different profiles of multi-located Italian researchers, in relation to the types of locations they work from, the experience they had during the Covid-working period and the likely future they suggest for university campuses. Policy-makers, rectors and academic staff can benefit from the results presented to rethink the way research is done, the size of the campus and the function of the university as an extended and more inclusive organism at the urban scale.

Keywords

Covid-19; Third Spaces; Academy; Coworking; Distributed Campus.

Introduction

In recent decades, the diffusion of Information and Communication Technology (ICT) and the availability of new digital tools enabled knowledge-intensive workers to spread their work activities across multiple locations (Ojala and Pyöriä, 2017; Di Marino and Lapintie, 2018). Multi-locality of work means mixing several locations in different time of the day or of the week to perform work activities (Di Marino and Lapintie, 2018). Recent literature has focused on multiple reasons that drive the choice of working multi-locally, as well as on the ideal personas that select a multi-local pattern. However, only few studies (e.g., Bruchell et al., 2020; Wheatley, 2020; Di Marino and Lapintie, 2018; Ojala and Pyöriä, 2017) analysed which types of locations workers access and with which frequency and, namely, which may be the impact of such a phenomenon on the urban environments. Moreover, current literature extensively focused on broad categories of multi-local workers – e.g., knowledge workers at large (Burchell et al., 2020) – while job-type specifications may be crucial.

Among the population of multi-local workers, academics are usually under-represented. Few research focused on the academics' need to find collaborative spaces for multi-disciplinary work, entrepreneurial activities, and connections with enterprises off-campus (Rajalo and Vadi, 2017). Others explored the need for a reserved space for concentration and individual work (Seddigh and Berntson, 2014; Gornall and Salisbury, 2012) as well as familiar and personal motivations which may push academics off-campus (Mokhatarian et al., 1998).

This research focuses on academics as a specific type of knowledge workers (Davenport et al., 1996; Gornall and Salisbury, 2012) who adopted multi-location of work and, accordingly, may be proponents of new models of university campuses within urban contexts. Moreover, the disruptive impact of Covid-19 on the world of work has been crucial also for academic work and opened new opportunities for re-designing work policies and workspaces within campuses. Indeed, campuses are centres of innovation and social sustainability within cities and requires an adequate collaboration between its users (i.e., students and academics) and the city at large (den Heijer et al., 2018).

For these reasons, this research aims at understanding who were the Italian academics that adopted a multi-local pattern during the so-called Covid-working period, meaning the period in-between strict lockdown phases when academics were not "obliged" to work-from-home but they were almost free to decide where to work (Tagliaro and Migliore, 2021). The analysis aims at finding which *other spaces*, beyond home and the campus, they accessed during Covid-working and which are the most valuable needs that drove their choices. Consequently, we aim at reflecting on the implications that these flexible habits may have on future university campus models. According to this framework, this paper attempts to answer the following research questions: Who are the academics that adopted multi-location of work during Covid-working? Which implications does multi-locality give to plausible models of distributed university campuses?

In order to address the two research questions, the study presents a literature review on multi-local work for academics. Furthermore, the paper presents the descriptive results of a survey distributed to the whole population of Italian tenured academics in summer 2020. The analysis yields three ideal types or profiles of multi-local workers and their research and spatial practices within different work locations. Although it is not possible to generalize the multi-local academics' needs with these data emerged from the survey since these are strictly connected to the Italian academic community, the analysis helps in defining the profiles of multi-located workers informing the limited literature on the topic and figuring out plausible implications for future universities campuses and cities at large. Our findings contribute to the literature on work location patterns, multi-locational work and remote working. Our results also contribute to the literature on academic work and university campus management, by drawing attention to an important but understudied type of knowledge workers.

Implications and conclusions

The results of this study give an original contribution on the understanding of the multi-local work in the academic context, which generally received less attention from the literature (e.g., Koroma et al., 2014). Even during the Covid-working period, multi-local workers carefully selected their work locations between the university campus, the home and *other spaces* (Di Marino and Lapintie, 2018). This study shows that specific types of *other spaces* resulted crucial for work continuity of some academics. Namely, other organizations' premises were exploited for collaborative and individual activities, public third spaces such as bars, libraries or coworking spaces were used for teamwork and collaborations, and other locations such as in transit spaces (e.g., cars or trains) or privately owned studios were accessed for individual and collaborative activities respectively.

This scenario related to the Covid-working period helps in figuring out future development of the phaenomenon and possible implications at the individual, university, and city level. The three ideal profiles identified together with the descriptive statistics reported lead us to important implications for understanding how the physical spaces may be supportive for (i) managing social sustainability of the academic work environment, (ii) effectively improving the alignment between campus facilities and the academic activities, and (iii) increasing the interactions between industry, universities, and public institutions. Considering these external *other spaces* as

integrated physical support to a model of distributed campus may have strong advantages for academics, universities, and cities.

First, we found that, during Covid-working, academics who adopted a multi-local pattern for their research were especially older adult men without family constraints (i.e., children). They were mainly associate or full professors who do research in life sciences, legal sciences, architecture and civil engineering. Even if, the ability to work remotely promotes workplace inclusiveness (Pyöriä, 2003), the unbalanced access to these spaces in relation to disciplines, genders and age show that multi-location of research work was generally not socially sustainable during Covid-working. Future campus models should engender policies of inclusion, in order to increase social sustainability and gender equality in academic institutions. For instance, literature is showing how female-oriented coworking spaces (Sargent et al., 2020) may be sources of equality and inclusion in the work environment, providing also more favourable commuting times (Clifton et al., 2019). Universities may think to create partnerships with coworking space suppliers. These actions may lead to positive results on collaboration and hybridizations of skills. Moreover, universities have to rethink their policies for supporting their diverse workforce at every level of the career, also providing supportive spatial strategies which may help in work-life integration.

Second, future campus models should integrate the *other spaces* that academics effectively used before and during the Covid-working period. We need to increase our awareness that the work of academics does not only take place within the traditional campus and that *other spaces* can be valorised within a unique strategic model. Accurate planning policies of future campuses should support research life before, during, after working hours by providing accessibility to campus and off-campus spaces located near the campus. Although a model of distributed campus may lead to a diffusion of university's identity that may hamper academic sense of community (den Heijer and Curvelo Magdaniel, 2018), exploiting and converging off-campus spaces within a unique campus strategy can represent a development opportunity from which all actors involved (academics, students, campus managers and public society) can benefit. Indeed, rethinking the methods of access, use and timing of use of spaces may lead to better integration of new functions in collaboration with external actors or other institutional and cultural actors, neighbourhoods, cities.

Third, the distributed campus model could contribute to city planning towards multi-functional districts which actively integrate higher education functions within residential and tertiary activities (den Heijer and Curvelo Magdaniel, 2018; Di Marino and Lapintie, 2018). The biunivocal beneficiary relationship between the campus and the city stays in the mutual benefits that universities and campuses can gain from the distributed campus model: universities can benefit from the network of functions and physical resources available in cities in order to attain shared goals (e.g., stimulating innovation, improving university-industry relationships, increasing sustainability, which are already on the agenda of universities and public party alike). Cities may benefit from the presence of university communities of students and knowledge workers, adding to the vitality of areas close to the campuses as urban regeneration strategies.

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City, public space, architecture. Looking for community.

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Abstract

Thinking about the future of the city, public space and architecture after the recent upheavals caused by the pandemic necessarily implies thinking about the idea of community as a vehicle for facing future challenges for the contemporary city. Working on the city does not only involve working on space, but also on the social, economic and cultural fabric.

Sustainability of urban and architectural scale projects is here intended not only as an increasing dependency on renewable energy, an implementation of sustainable building materials and many other aspects concerned with sustainable developments, but also, and perhaps especially, as cultural sustainability, according to which the architectural project is placed in an appropriate and congruent way with the elements that characterize the context in which it is placed.

We can therefore speak about urban and social sustainability. In this context the school, intended as an educational space for future generations, represents a paradigmatic opportunity for this process of collective, sustainable, urban and social reconstruction. This paper will develop these issues through the presentation of a project, a case study, that underlines an innovative vision for the future of educational spaces.

Keywords

Architecture; Contemporary Cities; Public Space; Social Interaction; Sustainability; Educational Space

Introduction

The research investigates possible planning trajectories through which the emergency crisis of recent months can become an opportunity to define innovative and long-term strategies for development and transformation of city's spaces. The theme of schools is taken as a paradigmatic tool to define a possible method of intervention that interacts with the mechanisms of both urban and social development.

The project for the post-Covid-19 school presented assumes therefore a character of theoretical and compositional experimentation, a radical design experience that expresses its value if interpreted as a research trajectory for future urban visions.

The investigation deals in particular with the project elaborated for the International Award "(Re)designing the school with the new generations post Covid-19" that, during the months of pandemic, has opened a debate in the field of architectural discipline for an overall rethinking of school architecture, towards an open, cohesive and inclusive school able to trigger new relationships with the surrounding urban space.

The school project not only investigates the specific spaces for teaching and education for new generations, but also, and above all, a new system of relationships between school and city, student and society, individual and community.

The deepening relationship between school, city and public space highlights a possible and desirable synergy between education place and city, as an expression of *civitas*, the *logos* place for individual and community. Recovering the reflections of famous authors such as Oswald Mathias Ungers and Aldo Rossi, the city is understood as the fixed scene of the theater of man's daily life: "Architecture as a theatrical representation enters the scene on the urban level. The arrangement of architectural bodies in space can also be interpreted as a stage set. The arrangement of objects in space is the setting up of a stage for the different human activities, for the roles of the actors, for the life that takes

place there. Consequently, every area, every place is transformed into an architectural theater that stages the representation of the individual if the stage is private, or of the collective if it is a public stage, that is, of the city." (Ungers, 1998).

6. Conclusion

In a situation of globalized crisis that invades all aspects of human life, both private and collective, what is the relevance of these reflections on dwelling, and specifically, on spaces for education? What can be their teaching in defining the features of a new way of building? The pandemic, economic recession, isolation, social disruption and climate change urgently require a rethinking of values so that architecture, understood in its broadest sense as the construction of places to dwell, can address these problems with a long-term vision.

Schools is not just an establishment dedicated to the educating and instructing pupils, it is an active, vibrant community open to wider society. It is the place where we prepare for the future, where we experiment, grow, socialize, and learn to respect other people, places and the environment. For this reason, school spaces must be devised, designed and built not only to be safe and foremost, but also to ensure flexibility between different school environments and activities, to provide a place of interaction between classrooms and urban spaces, to encourage socialization, to be a place to meet and discover, open to the entire community even after school hours. Designing such spaces must therefore be geared towards continually seeking balance between the school community and the city, and the general pubblic.

According to the hypotheses formulated here, the project ideas presented are not definitive solutions or quick recipes, easily reproducible, that can trace the idea of a new way of dwelling, an error of method that cannot be proposed considering the complexity of the themes that nourish the issue. Through the project, intended as a phase of research, have been investigated rather than some trajectories through which we can develop a re-education in the essence of living today.

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Rethinking urban habitat: the *green* challenge in planning experimentation for building reuse in the city of Prato

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Abstract

How Municipalities will be able to overcome technical barriers in addressing urban revitalization implementing more sustainable planning policy? The involvement of research institutes and the support of universities as driver of co-design process represents a key success factor in the preliminary phases of recovery interventions within the delicate systems of existing districts and disused industrial areas. The need to think about best strategies of reuse and regeneration before the formulation of fully defined projects is clear. Universities can guide public administration to achieve these goals in complex contexts, also encouraging partnerships with private or public investors. The paper presents the experience shared with Municipality of Prato intervening in a dense of overlap of productive, residential, and social fabric, and obtaining the honourable mention from the Common European Sustainable Built Environment Assessment in the category of developing retrofitting projects in 2019. These processes fostered participation in PINQUA national programme, to support Social housing retrofitting actions and revitalization of urban space to implement well-being and quality of life. Municipality of Prato uses building recovery as a tool for change supported by sociology, architecture, and art, based on the awareness that environmental sustainability can only take place if integrated with circular economy and urban resilience

Keywords

Sustainable Urban Planning, Buildings Reuse, Urban Habitat, Social Housing, Co-design partecipatory proces

Background: the city identity and the roadmap for urban revitalization

The city of a hundred chimneys. The concentration of textile factories was so high that the City of Prato is mentioned for the industrial vocation, since the medieval period, shaping the identity his people and place. In the nineteenth century, the city changed due to an important industrial development, which still makes today one of the most important districts at European level. After the Second World War, when technological progress made the old factories obsolete, the large brick chimneys disappeared, except for some that are still standing today as relics of industrial archeology.

The demographic and economic increase of the second post-war period, characterized by a consistent immigration from all the southern regions, double up the resident population, accelerating on the one hand the birth of a mixitè (social mix) enriching over time, on the other a great urban growth along various lines. A particularly disordered growth that generated countless mixtures between small production activities and residential buildings according to a typical model of the productive city characterized by small production companies prevailed with employment relationships based on the entrustment of individual companies to third parties processing of the production cycle.

The Administration has been involved for years in the organic revitalization of the urban fabric of a city so complex and full of overlaps between the productive, residential and social fabric. A programmatic work started many years ago, developing some tools and related interventions, partly concluded or actually ongoing: DUP (Programming Document), PAES (Sustainable Energy Action Plan), PUMS (Urban Plan for Sustainable Mobility), PIU (Urban Innovation Project), PRIUS (Extraordinary program for urban regeneration and suburban security, DPCM 25 May 2016), URBES ISTAT Report, Guidelines on Immigration, Digital Agenda, Plan for the Smart City, Project 100 Squares.

In 2014, as part of the *Por Fesr 2014 - 2020 - Urban Innovation Project* P.I.U investments in favor of growth and employment and the resolution of social, economic and environmental problems, the first project *Piu 'Prato* was

financed. In 2016 the *Prato Al Futuro* program started, as a communication and participation path supporting new Operational Plan [1]. A dense program of moments and places, physical and virtual, where you can meet the inhabitants, associations, professionals, entrepreneurs and share with each one the general vision of social, cultural and economic development of the city of Prato. In 2019 the Operational Plan of Prato was approved as a new municipal urban planning tool by proposing a medium-long term vision, based on an idea of Sustainable Development, identifying strategic themes on which to concentrate the programming and towards which to converge the actions of both the public and private sectors. The aim of Operational Plan, to contribute for a healthy and resilient city using Nature Based Solutions in architecture, materialized in the launch of the Prato Urban Jungle [2] project in July 2020, a co-design project on 3 areas pilot for sustainable and inclusive development, carried out by the Municipality of Prato with European funds from Urban Innovative Actions.

Figure 1 The advertising campaing relatd to the *Creative District* and *Più Prato* project

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The Ontology of Landscape Architecture; Design thinking and semantic networks

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Abstract

Landscape architecture, both in practice and research, encompasses an extended range of concepts, many of which may seem separated and well-demarcated in their subject area. However, our current knowledge of this field corroborates the deep connection and mutual impact of all the issues that comprise the correct definition of landscape. A large number of factors contributing to landscape architecture on the one hand and the variety of issues affected by the decisions in this field, on the other hand, highlight the significance of knowledge management.

For this purpose, we suggest using semantic models with the help of the latest advances in the ontology technology.

In the lexicon of artificial intelligence, "Ontology" is a knowledge-based computational model consisting of concepts and relationships within a domain. As a tool for knowledge management, it is a modeling system of logical orders and relationships between the concepts in a discipline. This research aims to introduce the "Ontology of Landscape Architecture" (www.landont.com) as a means of thinking enhancement that aims to help practitioners and researchers build a coherent mental model and achieve a systemic, holistic and integrated thinking process.

Keywords

Landscape Architecture; Thinking, Ontology; semantic relationship; knowledge representation; knowledge management

Introduction

Landscape as the host of many complex systems, including the ecological, economic and even sociopolitical systems, is believed to be well captured in Steiners‟s definition as the "connective tissue of our world" (Dinep & Schwab, 2010)

Notwithstanding Steiner‟s definition, the interdisciplinary character of landscape architecture makes it hard to be defined (Williams, et al., 2004). Landscape experts are therefore concerned with the array of different issues that need to be addressed in their work. These issues may seem disparate in many cases, since their cover subject areas including but not limited to the cultural context, formal considerations, land use, public policy and regulations, etc. Based on the assumption that there is a core to the body of landscape architecture knowledge (waugh, 2013), some of the issues are at the core of this knowledge and some hold a less focal position. The wideness in this conceptual range indicates that research and design in this field are prone to fragmentation, which may be defined as the failure to recognize the connection between the issues, or the magnitude of their mutual impact. Therefore, any comprehension and integrated engagement with the connective tissue of landscape depend on the recognition and clarification of issues and their relationships. Computational models could help this clarification.

The computer models of semantic networks have been designed to replicate the structure with which the human brain stores knowledge (Quillian, 1968). Ever since the

first computer model for associative memory, the "semantic memory system", the modeling of the knowledge domain and capturing the semantics of information and facilitating their retrieval have been very useful in supporting the thinking process (Katifori, et al., 2010). The objective of this research is to introduce the "Ontology of Landscape Architecture" as a means of thinking enhancement. The result is not a simple classification (Deming & Swaffield, 2011) of words, but a logical framework (Groat & Wang, 2013) formed based on the analytical comparison of references‟ content and their presented ideas in order to discover and state relationships between different concepts.

The objective of this research is to introduce the "Ontology of Landscape Architecture" as a means of thinking enhancement, which aims to help practitioners and researchers in building a coherent mental model and achieving a systemic, holistic and integrated thinking process.

In the lexicon of artificial intelligence, an "Ontology" is a knowledge-based computational model, consisting of concepts and relationships within a domain. It is a tool for knowledge management; a modeling system of logical orders and relationships between the concepts in the context of a discipline.

In view of that, the article proceeds by dealing with thinking process in landscape architecture. The concept of "Ontology" is introduced in section three and its benefits of ontology for thinking about landscape architecture are discussed in section four. A brief introduction is offered in section five about developing the Ontology of landscape architecture. Afterwards, there are some notes on the development process. Finally, section seven focuses on the future of the research.

Conclusion

This study set out to introduce the "Ontology of landscape architecture" by which to manage the knowledge and information in this field. This ontology can help and guide users through the thinking process and provide support for integrated thinking in landscape architecture. By means of language clarification, it offers a platform for a common vocabulary and terminology as a major requirement for communicating within the field of landscape architecture along with the other relevant fields of study.

The present Ontology also offers a platform for mapping previous and ongoing projects and research based on keywords in order to monitor, assess and predict emerging trends in the subject area by means of network analysis. It can indicate knowledge gaps and guide new efforts to clarify and establish the comprehensive map of the discipline. Besides, we believe that students of landscape architecture should be skilled at developing the Ontology of their project in order to represent and map the thinking process during research or design. These thinking maps facilitate both the reflective practice and the peer review of the final work. Clarifying the decision making and thinking process, helps us achieve coherent solutions for the complex and pressing challenges of the future environment.

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Liveable urban open spaces for health and wellbeing. Towards the Careggi Campus landscape masterplan for the Florence University Hospital.

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Abstract

Spatial fragmentation and congestion have more and more involved cities also because of functional specialization of open spaces. Such phenomena also affects accessibility of public realm and so urban liveability. Dealing with this main topic with regard to the public open spaces it seems necessary to turn them into dynamic and flexible places able to induce wellbeing and to develop a shared identity. Among all urban open spaces, those related to hospitals and universities play a double role concerning both the specific functions of care, research, learning, innovation and the overall liveability of the city in which they provide collective services. The ongoing research "Careggi Campus" deals with the case study of the Florence University-Hospital as an important part of the wider urban network of public open spaces. In this complex over twenty thousand people per day live fragmented and cluttered open spaces with a clear lack of accessibility and liveability. The research aims to carry out a landscape masterplan focused on a concept of transition from a street-based model of mobility and accessibility towards a people-based network of liveable places. In such a context accessibility is a complex driving criterion for landscape design to investigate how the hospital open spaces could perform as a high-quality network and sustain health by providing wellbeing and feeding lifestyles changes. A main topic of research is how this collective system can host the existing wide variety of permanent functions and spontaneous uses without creating conflicts and dysfunctions. As a vision of innovation about public transport, active mobility, intermodal parking-lots is promoted by the new Urban Sustainable Mobility Plan, we suggest that rethinking hierarchies between vehicles and people's active mobility within the University Hospital could lead to a sustainable transformation of its landscape.

Keywords

University hospital; Urban open spaces; Liveability; Accessibility; Health campus.

1. Context

Spatial fragmentation and congestion have more and more involved cities also because of functional specialization of open spaces. Fragmentation is not just a key concept in ecological landscape studies, but also in the sociological urban ones (Piroddi & Colarossi, 1991; Madanipour, 1999, 2005; Parker et al., 2012; Mela, 2014; Dayo-Babatunde et al., 2019; Kärrholm & Wirdelöv, 2019). Fragmentation is also considered with regard to the relationships between single open spaces and the urban landscape (Romaniak et al., 2014; Kilić et al., 2019) and to the concept of tissue (Piroddi & Colarossi, 1991), but it matters at the single open space scale too (Carmona, 2010), especially in the urban landscape and with regard to the public realm. The splitting of open spaces in sections with functional specialization makes every part less than the whole, not just about the unitarity and expressivity of its image but also considering its 'breath' and the related capacities to meet and support different needs and loads of use. Such phenomena affected accessibility of public realm and so urban liveability.

Open spaces are often cluttered also because spatial congestion due to objects, signs and signals is added to factors of size of flows of people and vehicles. Dealing with this main topic it seems necessary to turn open spaces into dynamic and flexible places able to induce wellbeing and to develop a shared identity. Among most visionary, meaningful and effective contemporary experiences we consider the critical proposals by Jan Gehl (2010) and initiatives carried out by his agency (Tsay & Gold eds., 2017). Furthermore, according to Kathryn Gustafson, Neil Porter and Mary Bowman (2021), the research by designing of uncluttered and barrier-free places emerges as a key towards more healthy and liveable cities: it allows to 'clear' spaces, but also to foster the non-motorised mobility (Forsyth et al., 2009). Since the main Buchanan's work "Traffic in Towns" (MoT, 1963) brought to light the need to face the problem of cars in cities many contributions have been given both in the scientific discourse and in the professional practice on this issue. The design for sustainable mobility has become relevant, trying to figure out which quality features are needed to encourage walking and cycling and enhance places' identity in cities while reducing the danger produced by vehicles. Different approaches have emerged to accommodate by design all functions required to streets in this perspective. Among others "woonerfs", term first coined in 1965 by Niek de Boer, refer to residential areas where vehicles conform to pedestrians and cyclists rules, "complete streets" emphasize the need for a comprehensive design for users of all abilities and with all kind of transport. Besides, "democratic streets", in Mark Francis theory (2016), deal much more with the concept of collective use and social equity, and "shared streets", as promoted by Hans Monderman, concern the removal of signage for a self-regulated sharing of space among all users and vehicles. An insight of this last approach is also provided in this research to better explore its implications in landscape design.

Credits

The research Careggi Campus is an initiative of the Department of Architecture of the University of Florence and of the General Direction of the Careggi University-Hospital Public Company. The process has been promoted by Gabriele Paolinelli and Saverio Mecca for the University and by Rocco Damone e Valentino Patussi for the Company, is coordinated by Gabriele Paolinelli and it's being carried out by Francesco Alberti, Nicoletta Cristiani, Giacomo Dallatorre, Lorenza Fortuna, Luca Marzi, Claudia Mezzapesa, Emanuela Morelli, Lorenzo Nofroni, Nicoletta Setola, Antonella Valentini. Several students are providing their collaborations in the master degree programmes in Landscape Architecture and in Architecture.
Pictures in this paper have the following specific credits: figures 1-6, Nicoletta Cristiani & Gabriele Paolinelli; figure 7-9 Nicoletta Cristiani & Giacomo Dallatorre; figure 10, Lorenza Fortuna & Claudia Mezzapesa; figure 11, Andrea Giorgi, Iliass Houbabi, Biagio Martino; figure 12 Alessandro Dallalibera & Giacomo Premoli.

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Artificial wetlands as a key for the construction of new sustainable urban systems.

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Abstract

Traditionally, in the water route, an intimate relationship between man and nature could be observed. Its flow, its occupation, generated a natural relationship, respecting the logic of this route. However, this relationship between man and natural processes, based on a deep understanding of complex and dynamic ecological processes, has been affected in modern times. The idea of control and centralization buried these processes through a system of invisible infrastructures, resulting in a disconnection between the path of the water and the ecological processes of the landscape. Providing clean water and an adequate sanitation system does not represent great complexity. Basic technologies and engineering principles are known and mastered; however, it is striking that more than one billion people in the world still suffer from inadequate access to clean water and almost two billion from unsatisfactory wastewater treatment. Furthermore, it is possible to affirm that water-related diseases are the leading cause of premature death in developing countries. In the search for a solution to the contamination of water sources and soils, we propose exploring Nature-Based Solutions (SNB). These are solutions that provide environmental, social, and economic benefits. The research focuses on a hydraulic sanitation system disconnected from the central network; this system consists of designing a system of artificial wetlands to treat wastewater produced by direct discharges to streams and rivers. The most important results show that this phytoremediation technique is characterized by being a passive and aesthetically pleasing cleaning practice that takes advantage of the capacity of plants and solar energy to treat these polluted waters. Therefore, it is urgently necessary to rethink these sanitation concepts with a new approach that interrelates constructing infrastructures, ecological functions, and free spaces for people as a possible way of new sustainable urban systems.

Keywords

Artificial Wetlands, Sustainable Development, Ecological Processes, Wasterwater Treatment

Introduction

The accelerated growth of urban agglomerations is a phenomenon that, although globally accepted, admits nuances and particular considerations depending on the local context. In the territorial case of Latin America and specifically of the city of Cuenca-Ecuador, we can foresee two characteristics for the coming years: 1) the consolidation of a majority of urban population and 2) a high rate of urban growth, which has overflowed the city itself and threatens the territory as a whole.

Thus, it seems evident that such a projection anticipates an enormous challenge in its planning. However, such an opportunity requires a thoughtful reconsideration of the methodologies and instruments with which the city has been *organized*. This study explores off-grid infrastructures in the transitional space between the countryside and the city known as peri-urban, then it is the edge space where a fundamental role is played for a sustainable urban future in the broadest sense.

In this context, this paper takes a theoretical-methodological approach consisting of three sections: 1) *Urban Edge*, which argues the need to recognize urban edges as a new project category that allows us, on the one hand, to move away from the negative connotation of the term peri-urban, and on the other, to go beyond the urban

scale and overcome old binary oppositions such as center/periphery. 2) *Social metabolism and the city*, which explains the relationship between social systems and ecological systems. Moreover, 3) *Off the grid*, which reviews decentralized and off-grid infrastructures for wastewater treatment. The most important results revolve around new sanitation concepts with an approach that interrelates infrastructure, ecological functions, and free public spaces for people.

Conclusions

The urban fringe is a transitional area between the countryside and the city where its proximity to the urban center makes agricultural or forestry use difficult; Therefore the main characteristic is the ambiguity of different uses, actors and interests.

Moreover, it is important to note that this area will congregate the majority of the population in this century. It is essential to recognize the urban edges as a new project category which allows us to move away from the negative connotation of the term peri-urban, and also overcome the traditional city/countryside dichotomy.

This third space (neither urban nor rural) has its own characteristics and problems, but above all, it has a great ecological value constituted by agriculture, forestry, as well as the corridors that are formed from the rivers and streams which are part of the unquestionable ecological value that must be recognized and appreciated. It should also be considered as a central element for the design and planning of a new sustainable and resilient urban/rural dimension.

Therefore, eliminating urbanistic expectations is fundamental to preserve this area, which beyond being seen as an expansion zone, should be understood as a space of opportunity which articulates in a complex and evolutionary manner crops, forests, communities and city

In the specific case of the Sinincay parish, 5 of its 38 communities do not have running water and 16 of these do not have a wastewater treatment system which is 42% of its territory. This repeats in the other rural parishes of Cuenca, and of the country in general which is the main cause for water sources pollution.

However, this problem presents new opportunities for better harmonization between urban growth and environmental values. For this reason, exploring innovative strategies that allow for a paradigm shift in water resource management, particularly with regard to wastewater, will allow the optimization and greater access.

The construction and maintenance of a conventional wastewater system is very costly (Delgadillo-López & González-Ramírez, 2011), and requires a long amortization period of between 50 and 100 years, which this transition area does not have due to the accelerated process of transformation and growth of these territories.

Consequently, it is necessary to urgently rethink these sanitation concepts with a new approach that interconnects the construction of infrastructures, ecological functions and free public areas as a possible path to new sustainable territorial systems (Stokman, 2008).

Thus, the exploration of an off-grid water treatment system not only favors the protection of water sources, but could strengthen the productive character of agricultural areas, promote food self-sufficiency, and increase the economy.

In addition, it is very important to promote a geographical approximation between production and consumption, which by the end of the 19th century, anarchist geographers (Reclus and Kropotkin) saw as capital and now contemporary ecology sees it as absolutely essential for energy saving and the reduction of greenhouse gases (Oyon, 2011).

Finally, these studied territories with multifunctional characteristics have the capacity to produce their own water, energy, assimilate their waste, and above all, are a good place to live. Thus, ideal for shaping new sustainable centralities to reduce the dependence on the center and create a multipolar urban/rural ecosystem; an isotropic body, an ecological-social system without center or periphery (Viganó et al., 2016).

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The transfer of territorial mosaic principles to manage the peri urban landscape of Lille, France, The case study of the la Deûle Park

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Abstract

The transfer of knowledge from territorial mosaic theoretical frameworks to the actual urban sustainable policy success story of La Deûle Park, Lille France which I have studied since 2005, shows potential applications for peri-urban regions in developing countries as similary does our initial case of study: the Chivilcán - Nielol- Rukamanque landscape network, in the Temuco urban region, located in the Araucanía region of southern Chile.

Since 1998, Lille's regional government introduced ecological landscape policies in peri-urban planning for managing a total of 10.000 ha. of its urban region surface. A process of renaturation with corridors and ecological networks under territorial mosaic criteria model was developed. Thanks to landscape and ecological connectivity, these structures have a dual function or co-occurrence: 1) natural dimension: ability to function as an ecological structure for water management and biodiversity conservation and, 2) positive human results: provision of a diversity of socio-cultural and economic services.

First I will present the origin and trajectory of the research and then I will explain the case study of La Deûle Park peri-urban corridor. Subsequently I shall explain why this park was developed from a territorial mosaic model proposed in the research of RT. Forman, J. Ahern, C. Solar who defined the following criteria for sustainable landscape management of peri-urban territories: 1) the interconnection of hydrological systems allowing flood management of wetland and restoration of natural sites and wildlife reproduction, 2) increase of recreational spaces for multiples socio-cultural activities, 3) growth of economic activity with collaborative small-scale farming agri-environmental interventions to improve biodiversity and 4) the implementation of forms of transportation that fully take into account pedestrian, equestrian, cyclable.

Keywords : *Ecological networks, multifunctionality of landscape, urban sprawl, sustainable peri-urban planning.*

Introduction

It is a fact that landscape connectivity has been an object of study since 1860 and a principle that has inspired network projects carried out by Frederick Law Olmsted (1822 -1903) in several cities in the United States (Emerald network of the city of Boston), along with the hygienist work on avenues and landscape networks performed by Jean-Charles Adolphe Alphand (1817 - 1891), Jean-Pierre Barillet-Deschamps (1824-1873) and Jean Claude Nicolas Forestier (1861 - 1930) in Paris at the end of the XIX century.

From the beginning of this research process, in 2005, we ask ourselves about the natural and human dimensions of the territorial mosaic model to manage peri-urban landscapes and territories in the La Deûle Park. The objective of the research has been to achieve a theoretical and empirical framework to structure a hypothesis that could allow us to analyse and make possible the generation of holistic development of peri-urban landscape by territorial mosaic, always taking into account the connectivity and the co-occurrence criteria. The idea and vision of our studies were inspired by an ecosystem concept of the city and its surrounding territory. It is proposed that the design of public policies and management should integrate the rural landscapes and natural resources of hinterlands as a center of attention.

The research confirmed the hypothesis regarding La Deúle Park as a prototype of sustainable management of landscape in peri- urban areas through the territorial mosaics model. The Park integrates all the concepts to create an ecological park, founded on the principles of landscape ecology and landscape architecture, promoted and implemented by Richard Forman and Frederic Olmstead. Both have guided and inspired the theoretical and empirical research process.

Thus, this article aims at explaining the process of studying and researching in the realm of design and policies of green structures under sustainable criteria of connectivity and co-occurrence of territorial mosaics. The knowledge

transfer from territorial mosaic theoretical frameworks to the actual urban sustainable policy success story of La Deûle Park shows potential applications for similar peri-urban regions in developing countries such as Chile.

In this context the following question arises: how to manage peri-urban landscapes under criteria based on adequate design and sustainable public policies for the ecological climate change transition?

Faced with a reality of lack of protection, conservation, enhancement and sustainable management of sites, landscapes and peri-urban territories around the City of Temuco, in Chile, in 1996, I decided to devote myself to developing the scientific and empirical knowledge of management of such spaces.

Conclusions

Three mains conclusions could contribute to apply landscape architecture science to improve urban regions planning :

1. Transfer from science to political program of Lille Metropole. From the end of the 1990, local and intercommunal landscape projects in the peri-urban landscapes of Lille urban region are giving more spaces and well-being for nature and human needs and connecting urban spaces with rural landscape through the corridor of La Deûle Park as the hypotheses of co-occurrence propose.

2. The awards of the Council of European Landscape Convention and the Minister of Environment of France received by the La Deûle Park have confirmed the benefices of landscape connectivity and co-occurrence criteria of territorial mosaics to improve environment conditions for human and nature dimension of landscape in peri-urban areas of Lille urban region.

3. The study of peri-urban ecological network being presently could become a scientific base to be applied in countries where there is little experience in this field, like Chile, especially in the case of study of Temuco urban region: the Chivilcán - Nielol- Rukamanque landscape network.

4. What is proposed and confirmed today in this article and presentation, could define that in the global ecological crisis where cities play a fundamental role, it is advisable to found a new hygienist paradigm for a post-covid 19 urban regions ecological planning, to collaborate in the rocess of climate change and social inclusion through a socio-politic construction of territorial mosaics under co-occurrence criteria.

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Part V
Innovative approaches to Urban and Architectural Design towards Sustainability

Solar City, Future City; Analysis Of Solar Radiation Towards Optimization And Location Of The Urban Blocks In The Neighborhood Units

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Abstract

Energy consumption has been on the rise uncontrollably due to population growth. Therefore, paying attention to energy production and consumption in different parts of cities is inevitable. Since the energy production process depends primarily on fossil fuels, it causes a lot of environmental pollution including the discharge of carbon in the environment. In order to reduce environmental pollution, it is essential to consider renewable forms of energy, especially solar energy. This requires attention to energy issues in the early stages of urban design as well as practical and creative solutions for more efficient use of this type of energy. This study aims at calculating the annual solar radiation at a city scale through a novel process and methodology. In this regard, artificial intelligence algorithms and satellite data can help maximize the amount of sunlight in neighborhoods and urban blocks in neighborhood units during the development process. In the process of simulation, location and optimization of the urban form, it is necessary to take into account the limitations and resources for field study and simulation of urban blocks. Therefore, in this study Farhangian neighborhood in phase 1 of Kermanshah, Iran, which has a good level of structural diversity and lends itself to field studies, was selected and studied at neighborhood and urban block scales. The case study indicates the significant role of calculating and optimizing the patterns of urban blocks with the aim of achieving maximum solar energy. Estimates at different levels show that urban block variables are effective in accessing the solar radiation energy and, given various scales of development - from macro-scale spatial planning to micro-scale local design - can improve energy intake by 3 to 5 percent. Accordingly, the results show that in order to accelerate the calculation of energy at the planning scale, the use of 2.5D locating model and 3D optimization contribute to achievement of the maximum or minimum solar radiation, respectively. On the other hand, this method can be used to organize calculations and planning for maximum absorption of solar radiation at different stages of development.

Keywords

Urban Morphology, Solar Radiation, Optimization, Parametric Design, GIS, Ladybug;

Introduction

Efficient energy planning and design basically denote the relationship between land use and building design. Principles of efficient energy planning involve the systematic examination of the city in terms of three different scales, i.e., settlement characteristics, building block characteristics, and building characteristics when deciding on land use. It is therefore necessary to consider ideas for mitigating the effects of climate change and to ensure the efficient and effective use of energy (Mert and Saygın 2016). The related literature shows that urban geometry and energy consumption are closely related. In this regard, previous studies have examined in detail the relationship between urban morphological parameters and the theoretical energy efficiency and energy heat

generated by the spatial configuration of cities. A common theme in global approaches to the city and energy revolves around the potential of the sun as the largest energy source available to all urban areas(Amado, Poggi, and Amado 2016).

The process of energy efficiency or, more broadly, improving the sustainability of building quota, is not just a matter of technology optimization, but also involves decision-makers, investors, and citizens. In order to promote and regulate such a large and complex process in renovation projects, local authorities, i.e., decision- makers, must have the required knowledge and tools to design plans or programs that integrate the energy model into more comprehensive approaches to urban renovation(Pili, Desogus, and Melis 2018). In addition, the analysis of constraints on an urban scale makes it possible to determine more realistically the solar potential of construction surfaces. However, the analyses of typological factors and their sensitivity and relationship with the use of solar technology can lead to different interpretations by introducing weight indicators for different geometry, typology, and construction constraints that affect the integrity of the solar energy system. Despite the use of solar energy in cities to create sustainability in housing facilities, there is no related commitment in construction. Similarly, the amount of solar radiation is usually not taken into account in urban planning decisions. In fact, to formulate energy efficiency measures in new buildings, it is essential to know the levels of solar radiation reaching those parts of the building that can be used to install solar panels or heat collectors(Fernández-Ahumada et al. 2019).

The methods and tools used in the initial design phase should support architects and planners in decisions that lead to solar buildings and help further development and evaluation of various solar technologies in the construction phase(Horvat and Wall 2012). Tool constraints include model configuration and model simulation time for urban projects indicating the need for different solutions and simplifications to increase the speed and accuracy of such models(Dogan 2015). Urban morphology has a significant impact on solar potential, daylight and natural ventilation. Hence, comprehensive planning largely determines the inherent environmental performance of a neighborhood and its blocks. A wide range of related guidelines and simulations should be developed by architectural and urban planners in their design process. This parametric study, which is performed by simulation tools in a process-oriented approach at two different scales, is probably the first step to this end because it analyzes the different types of morphological structure and urban blocks and their potential contribution to locally produced energy. This study seeks to find a comprehensive solution to quantify the role of solar energy as a source of renewable energy in various urban morphologies. In addition, it investigates the possibility to achieve the maximum amount of solar radiation through the use of 2.5D measurement method and three-dimensional data, especially data on the urban block scale, and a combination of these two data types.

Conclusion

Although city and urban morphology is subject to numerous dependent and independent variables and reviewing and isolating variables in the research process is the only possible solution at this point in time, research in the field of energy, especially solar radiation, has always been a challenging topic. The need to produce early models of solar radiation levels for a city and ways to access them has been widely discussed. This study suggests a complete model in which the independent variable of average height and a dependent variable of solar radiation and optimization of the research variables were evaluated to achieve an optimal model in which the amount of solar radiation absorption is increased by about 3 to 5%.

The study of simulation at different scales has been assessed in both macro and micro domains, each with its own algorithm and type of analysis. However, in general, it can be concluded that in the macro-level data used in city planning whose documents and requirements are more related to land use, analyzes and simulations require higher speeds and less information. Thus, the process uses 2.5-dimensional DEM data, which are either collected through satellite data or through point clouds as fully described in the previous section. However, at the intermediate level, and especially at the micro level, 3D detailed data are needed, which is done using simulation within longer durations with higher accuracy. The only difference between the micro and the intermediate level

is the amounts of variables being measured. At intermediate level, the number of data should be controlled, because the amount of data in this case is very high and there may be an increase in computational error. However, in the micro approach, the number of independent data is lower and the analysis speed is naturally higher.

The main purpose of this study was to provide an optimal model to evaluate the maximum amount of solar energy absorption at urban block levels. First, the morphological variables at urban block level were studied. Then solar radiation energy at macro scale and micro scales were investigated. At macro scale, using two radar and point cloud techniques, solar radiation energy was calculated in the study area, which indicated the importance of macro data analysis at the neighborhood scale. and even urban blocks in the field of planning. On the other hand, the results showed that radiation data in different seasons produce fixed spatial data in comparison with each other. The method of calculating radiation time, which is a very important variable, was also calculated. Then in the next part, the neighborhood was divided into four sub-neighborhoods to measure the impact of different blocks on each other. In this part, optimization was done based on height dimension, indicating that the limitations in optimizer algorithms do not allow the measurement of more variables due to the large amount of information and data. Results on the average height at urban block level showed an increase of 3 to 5%.

On the other hand, a comprehensive algorithm was presented, starting a new approach in optimization and architectural algorithms, which can be discussed by researchers and relevant laboratories. Adaptation of genetic algorithms to satellite data and spatial variables can help solve major problems in solar radiation calculation. The first mode shifts the radiation and energy data to point-to-point spatial data, expanding the data beyond the general mode for different cities. It opens a new window into artificial intelligence algorithms for a better understanding of the structure of the earth and its impact on cities.

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Energy Efficiency and Building's Envelope: An Integrated Approach to High-Performance Architecture

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Abstract

One of the significant categories that profoundly influence global warming is the building industry. Many measures have been considered to reduce the building industry's impacts on the environment. However, there are still too many problems, especially in the implementation of the *Zero Energy Buildings*. Thus, in the following research, five green architecture principle categories have been analyzed on the 70 different projects chosen randomly around the world. Moreover, this article illustrates the impacts of green architecture indicators in both existing and designed buildings to find available capacities in various sectors for improving the building industry. As a result, the lack of proper plans for these green initiatives has resulted in arbitrary measures. Therefore, authorities should establish decisive and implemented rules to lead the construction industry to prioritize sustainable principles. Since even in projects concentrated on sustainable regulations were only designed and built based on a few green features, their significant potentials have been missed.

Keywords

Building Envelope; Conserving Energy; Green Architecture; Shell; Sustainable Building

Introduction

Controlling the amount of energy consumption, waste emission, and environmental damage in architectural fields is used to characterize a technology with a lower impact on environmental problems (Grierson & Moultrie, 2011) as future uncertainties such as climate change may worsen the condition (Bazazzadeh et al., 2021a). Indeed, Sustainable development can be considered continuous development in financial, natural, and human resources. It could provide sustainable economic, social, and cultural development (Mahdavinejad et al., 2014; Poodineh, 2017; Bazazzadeh et al., 2020). Therefore, for having high-performance buildings, sustainable principles should be according to these five main ideas (Yardimil et al., 2020).

- Energy conservation to protects energy throughout the life of a building by designing the flexible building interior or high-quality structure
- Design principle regard to climate land to take advantage of the natural elements and factors such as sun angles and shading (Mansourimajoumerd et al., 2020)
- Reducing the consumption of new resources by minimizing the waste in the construction process and reusing or recycling materials and the resources which are used in the construction phase (CGB, 2009)
- User needs to consider occupants' satisfaction and productivity in the building
- Condition of sites in design to reduce the impact of development on the natural environment, such as using wind patterns to shape the building form. (Ragheb et al., 2016; Peters, 2019).

In this paper, those factors have been analyzed on buildings envelope. Moreover, the building envelopes have been used as a shelter, security, solar and thermal control, indoor air quality control, moisture control, daylight access, and cost-effectiveness (Bolin, 2016). Hence, conserving energy by building envelopes could foster the energy efficiency of the building industry. Furthermore, a building envelope can enhance the efficiency of the building that is planned to construct and meanwhile, it is functional for existing construction (Bano & Sehgal, 2019). However, sustainable building envelope design is a complicated process involving many factors explained individually in the following paragraphs (Mickey et al., 2016).

Besides, these elements (building envelopes) act as a barrier between the building and the external environment and have a significant role in providing comfort conditions and energy demand (Kheiri, 2018; Acar et al., 2021). These elements not only have an active role in the sustainability of structures (Tabrizi et al., 2021a), even for historic buildings (Javanmardi et al., 2021), but also have the capacity for improvements through retrofitting strategies (Tabrizi et al., 2021b).

That is why an optimized building envelope can directly affect the capacity of a building's system, such as HVAC systems. The potential of the building envelope is so high that it has been reported that it can save energy demand of the building between 32% and 58%. It can also save up to 85% energy demand in the late evening, achieving delays peak (Alalouch et al., 2019). While envelopes of buildings traditionally characterized by a significant thermal resistance prevent their overheating, optimized ones tend to control the indoor condition with new solutions. (Zachar & Daoutidis, 2018) To this end, this paper aims to study the impact of optimizing the building's envelopes on buildings' energy consumption.

Conclusion

The building industry is one of the major categories that have a considerable impact on global warming. That is why many alternatives have been suggested to reduce the effect of the construction industry on the environment. However, it can be noted that there is still plenty of problems that have to be measured in this field.

Base on the findings, by considering the effects of the green architecture principles in the construction and design stage, the following data were achieved: 1) The rate of considering sustainable principles both in the construction section and design stage is lower than the average by 4.467 and 5.069 out of 14, respectively. 2) The average stability in the design section is greater than the implementation by 0.602.

Consequently, a zero energy building is only achievable with a comprehensive analysis of existing projects until the weaknesses are distinguished. Moreover, these sustainable architectural principles should be established as a law for all buildings with various functions to accelerate the process of having sustainable constructions. Also, an organization must deeply put all its attention to sustainable principles aspects of constructed buildings.

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Evolution of Users Behavior Towards Designing Public Buildings in The Era of Covid-19

Alexandria New Restaurants Design Case Study

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Abstract

A series of specific buildings and open spaces and more had a new design thinking and framework which require the rethinking in our built and open spaces after the pandemic of Covid-19. In this era of the pandemic, the design for public buildings could be a challenge, such as the design of commercial places as the restaurants since some needs have changed to provide contemporary open public spaces to get better good quality of life and interaction for the diverse populations in the cities. In this paper a new behavior towards architectural design was studied to achieve social distancing guidelines that promote separation to avoid the spread of the virus and encourage the design of open public spaces. In addition, the pandemic crisis has proved that the interaction between people and the built environment are the main engines that innovate architectural design theories. This paper reviews the evolution of architecture in the context of a survey about the opinion of users in the new design of the public buildings such as the new restaurants in Alexandria as a case study. As a result of the questionnaire is the development of the architectural adaptability to achieve the needs of the users and improve the design of public spaces to achieve the transformation of the behavior of people. Finally, the results of the analysis of the survey demonstrate the transformation of the architectural concepts and idea about the behavior of the users after Covid-19 and their interaction into the built environment and the outdoor design.

Keywords

Built Environment; Evolution; Rethinking; Quality of Life; Pandemic, ;Social Distancing.

1. Introduction

The decisions of restaurant visitors were related to visiting the restaurant again are not based solely on food satisfaction, but rather on psychological satisfaction with the interior elements and functions (Lee CJ, 2015) and specially after the world pandamic of covid-19 some behaviours and thoughts about closed and indoors public buildings design become a threat for some people. In this paper an evaluation of the user's behavior towards designing restaurants and café from different categories of visitors and different ages was explained in a survey. The results of this survey indicated that there are some main requirements and precautions to the visitors of the public buildings after the pandemic of the Corona virus specially the restaurants and café. The design of restaurants depends recently on the indoor and outdoor environment quality and visitors' satisfaction, which should provide a good quality of life and health since the environment is being attacked daily by human life and restaurants are a part of the problem (Choi, G., & Parsa, H. G., 2007) . Generally, research is also needed to better understand the suggestions of user's satisfaction in environmentally friendly restaurants design in the era of covid-19.

Conclusion

The findings from this research and survey offer valuable data showing that it is important for architects and designer to respect the changes in needs,and rethinking the preferences of the users toward the built enviroment and especially towards the public buildings since the survey has approved the evolution in the behavior of visitors towards the restaurants and café after the pendamic of covid-19, in addition of the importance to create new innovative idea to achieve better indoor and outdoor enviromental solutions and better quality of life as in the case study of the restaurants and café in Alexandria city in Egypt.

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Analysis of the development prospect and application of smart streetlamps in Macau based on the background of smart city

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Abstract

Smart cities are the mainstream trend of modern city development. With the promotion of the policies of the Guangdong-Hong Kong-Macao Greater Bay Area, Macao, as one of the four central cities in the Greater Bay Area, has pioneered the development of smart cities. The development goal of the smart city is to use modern electronic information technology to efficiently manage, coordinate, share, and interoperate the city's transportation, logistics, energy resources, and communication services. Comprehensive perception and information collection are the basis for its smart urban management. As one of the important node devices in the smart city perception layer, smart streetlamps are not only the lighting infrastructure, but also include important functions such as environmental monitoring, video surveillance, communication network, Internet of things, information interaction, and charging piles. Under the above premise, this article discusses the urban policies, applications and prospects of smart streetlamps in Macau. At the same time, it compares the social nature and related policies of the mainland, analyzes the particularity of building smart streetlamps in Macau, and based on the application of smart streetlamps in Macau, propose optimization and development suggestions to promote the construction and development of Macau's smart city.

Keywords

Smart streetlamps; Macau; smart city; Guangdong-Hong Kong-Macao Greater Bay Area; urban governance measures

The development history of Macau's smart city

The development of smart street lights in Macau is closely related to the construction of smart cities. With the launch of the "Outline of the Twelfth Five-Year Plan for National Economic and Social Development", the concept of smart cities has been widely promoted and implemented in my country. According to the National Development and Reform Commission’s According to the statistical report, more than 500 cities in my country have proposed smart city development plans. At the same time, the Macau Special Administrative Region Government clearly set the development goals of Macau to build a smart city in the 2016 "Macao Special Administrative Region Development Plan (2016-2020)" and "Policy Address", and established a “Smart City Special Group” and the “Smart City Task Force” coordinated, promoted and promoted the related work of smart cities within the government, and since then launched the prelude to the development of smart cities in Macau. Since then, the development of smart cities in Macau has been accelerated in various departments and fields and has achieved remarkable results.

At the end of 2016, the Macao Science and Technology Development Foundation sponsored four professional teams to carry out the research activities of "Macao Smart City Development Direction and Strategy Research" and "Macao Smart City Development to Smart Travel Feasibility Study". Scholars, industry representatives, social organizations, etc. investigate and visit, and hold relevant seminars and consultation meetings to collect opinions from the community. In 2017, the smart city development guidelines and policies that conform to the actual conditions of Macau were launched.

In August 2017, the Macau SAR Government and Alibaba Group signed the "Strategic Cooperation Framework Agreement for Building Smart Cities", using Alibaba's cloud computing and big data technology to accelerate and complete the government's infrastructure construction and information technology for building smart cities reserve.

In May 2018, the Science and Technology Commission of the Special Administrative Region Government held a consultation meeting, press conference and forum on "Macao Smart City Development Strategy and Key Field Construction", and collected more than 200 suggestions, focusing on laws and regulations, electronic payment, and data sharing. , Traffic issues, data privacy, electronic medical records, SME support, urban comfort and other issues.

In August 2018, the University of Macau established the State Key Laboratory of Smart City Internet of Things to promote the development of Macau's Smart City Internet of Things technology.

In November 2018, the Guangzhou Blockchain Industry Association, the Hong Kong Blockchain Industry Association and the Innovation Center of the University of Macau established the Guangdong-Hong Kong-Macao Greater Bay Area Blockchain Alliance, which aims to integrate the resources of the three places and achieve complementary advantages. In-depth application of blockchain technology in smart tourism, smart finance and smart logistics.

In December 2018, Macau Telecom signed a memorandum of cooperation with Tencent to use Tencent Cloud technology to cooperate in the fields of cloud computing, big data, Internet of Things and artificial intelligence in Macau.

In February 2019, the Macao Science and Technology Development Foundation and WeBank signed a cooperation agreement. The first cooperation project will use blockchain technology to achieve safer and more efficient entity identity authentication and data exchange, accelerating the popularization of electronic payments in Macau.

In May 2019, the Macau Smart Street Light Project was completed, integrating more than 20 functions such as smart lighting, 5G/4G communication micro base stations, flood monitoring, people flow monitoring, charging piles, etc., providing the SAR government in energy, transportation, public security, tourism, etc. Provide services in multiple fields, achieve multiple uses with one shot, and help build smart cities.

In September 2019, China Mobile Hong Kong, China Mobile Guangdong, Macau Telecom, and Guangdong Communications Industry Association jointly established the "Greater Bay Area 5G Nagano Alliance", which has deepened the coordination of communications technology in the Greater Bay Area and promoted the development of the 5G ecosystem.

In December 2019, Bank of China United Net Union Clearing Co., Ltd., UnionPay International Co., Ltd. and Macau Pass Co., Ltd. launched a "cross-border wallet" service that facilitates cross-border mobile payments, breaking the barriers of mobile payment in the two places.

In April 2020, the Macau government issued the "2020 Policy Address", which specifically pointed out the development plan of creating a "digital Macau" through a new generation of information technology, and speeding up the construction of 5G networks, data centers, and digital infrastructure to improve the city. The level of intelligence in management, industrial development, government services, and social governance will promote the construction of smart cities such as smart government affairs, smart customs clearance, smart medical care, smart tourism, and smart transportation.

In June 2020, the General Office of the Ministry of Transport, the General Office of the People's Government of Guangdong Province, the General Office of the People's Government of Guangxi Zhuang Autonomous Region, the General Office of the People's Government of Guizhou Province, and the General Office of the People's Government of Yunnan Province issued the "About the Pearl River Water Transport to the Guangdong-Hong Kong-Macao Greater Bay Area" Implementation Opinions on Construction" to promote the construction of smart ports, smart waterways, smart ships and smart maritime affairs in Guangdong, Hong Kong and Macau. Accelerate the construction of smart port projects, advance the construction of the digital waterway of the Xijiang trunk line, advance the research and development and application demonstration of intelligent shipping in Guangdong, Hong Kong and Macao, promote the integrated application of Beidou navigation system, Internet

of Things, cloud computing, big data and other information technologies in the field of water transportation, and promote the integration of information technology based on the area. Research and application of block chain global shipping service network platform.

Conclusions and recommendations

At present, smart street lights in Macau are still in the experimental application stage for the first time. Compared with some mainland cities, they are not the first to be carried out in the Guangdong-Hong Kong-Macao Greater Bay Area. Therefore, through the development of smart street lights, we can see that Macau has a certain degree of contribution to the construction of smart cities. In addition, due to the legal division and protection of the historical urban area and the buffer zone of the world cultural heritage in Macau, some residential areas in the old urban area have not been able to put smart street lights into use, so they are more restricted.

In this regard, the research suggests: for the reclamation area of the new city, smart street lights can be considered to be deployed in urban planning and construction to make subsequent urban data detection and management more convenient; and for the larger historical urban areas such as the Macau Peninsula In the area, the application of smart street lights is more difficult. If the original street lights are relatively modern and have a certain destructive effect on the city, they can be considered to be transformed into smart street lights; for Taipa and Cotai City areas with more modern buildings and denser traffic, then It is necessary to increase investment in the application of smart street lights to facilitate standardized management of urban traffic and urban crime prevention. At the same time, it should be considered that the appearance of smart street lights in different areas is consistent with the urban style or architectural style of the area, instead of using the same smart street lights in the entire Macau SAR.

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Predicting Performance Measurement of Residential Buildings Using Machine Learning Algorithm

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Abstract:

Applications of the Earned Value Management (EVM) as construction project control techniques are not widely used in Iraq, despite the benefits of the EVA in the scheduling and costs control of construction projects. Therefore, this article aims at introducing a novel approach, using Artificial Intelligence Techniques (AIT), for EVM for Iraqi projects. This aim will be achieved through the use of two techniques; Multi-Linear Regression (MLR) and Support Vector Machine (SVM). These techniques are used to build mathematical models for estimating the Schedule Performance Index (SPI), Cost Performance Index (CPI) and To-complete Cost Performance Indicator (TCPI) in the residentials buildings in Iraq both before and during their executions phases. Web-based software is designed to achieve the estimating calculations swiftly, precisely and with fewer efforts. The MLR technique was used to identify the impact parameters using Statistical Package for the Social Sciences (SPSS) program, which presented sufficient estimating results regarding the Average Accuracy percentage (AA%) and correlation coefficient (R) calcualted for the SPI, CPI and TCPI. The values of AA% were found to be (95.89%, 96.89%, and 95.91%), and those of R were 92.911%, 98.916% and 97.837% for each of SPI, CPI, and TCPI, respectively. The second technique was applied in creating prediction models is the SVM, whereby the SMOreg algorithm is used in the WEKA software. The outcomes were explianed in terms of Average Accuracy (AA%) being equal to 94.12%, 71.76%, and 84.82% and the correlation coefficient (R) being equal to 99.56%, 91.744% and 99.71% for SPI, CPI and TCPI, respectively. To sum up, the outcomes indicate that the SVM technique provides high-quality results of estimation in comparison with the MLR technique.

Keywords: Earned Value Management, Cost, Schedules, Residentials buildings.

Introduction

Performance evaluation of any project plays a central role in the development of a management plan for that project. Performance size gives critical information to analyse the general performance, which is very important for the owners, contractor, and managements professionals to control the development of the construction processes, assess the future cost of the projects, and estimate its competitionx in the global markets. One of the most influential and well-known machine learning algorithm that enables a system of learning through built-up experiences (hidden in the data fed to the system) and knowledge generalisation. The theory of SVM, as introduced by Vapnik and others, basically depends on the concepts of statistical learning [1].

The developed community's coaching is run using the SMOreg algorithms that consists of 3 once developed and phases; the feed-ahead phase of the inputs training pattern, the calculations and backpropagations phase of the related errors, and the weights adjustments phase. The aim of this article is to development of the MLR and SVM models to forecast the earned values (EV) of residential buildings projects. To meet the objective of this article, it is crucial to find out the factors that are affecting the performances of residential buildings projects. Thus, this work focuses on the development and evaluation of the model performance, which forecasts the EV through (1) identifying the effective factors that have effects on the EV index (EVI) in residential buildings projects utilising the multiple linear regression techniques that were run using SPSS software, (2) developing and assessing the performances of the suggested MLR and SVM models to forecast the earned costs and scheduling indicators, and (3) verify and validate the developed models. Additionally, web-based software was created, developed, and applied to perform the calculations of the required information to estimate the EVI swiftly and precisely.

The author in [2] proposed an SVM-based model to present early budget estimations for the construction of bridges. The developed cost predicting model uses the basic information and parameters on bridges during their initial early stages as input. The obtained predictions were sufficiently accurate, with an acceptable error range of estimation being 25-30%. As for the work in [3], they developed materials quantity models for the abutments and caissons as parts of the complete bridges structures, using a pre-stressed concrete I-girder super-structure. The authors proposed the use of MLR analysis whereby several equations are applied in estimating the concrete volume and reinforcement steel weights of the aforementioned components.

The present study aims towards the development of an alternative model enabling quick and accurate estimations of site overhead costs. The proposed estimation model depends on machine learning algorithms which is SVM, for estimating time and cost indexes, which eventually help in predicting the overhead site cost during the initial project construction stages accurately and precisely. The use of MLR and SVM techniques in this work is mainly for predicting the EV of projects to help project managers, contractors, and planners in making appropriate

decisions. This study contributes to the identification of the most efficient activity regarding model structures and variables in predicting the project's EV. The performance of the SVM will be compared with Regression Analysis (RA).

In terms of the study novelty, it could be summed up in obtaining standard local equations that are very accurate in predicting the earned value indexes with less error, using smart technology in the activities of earned value management. This should save lots of time, efforts and costs. These models provide fast solutions to the management authorities of the Iraqi projects in terms of the EVM. In addition, web-based software is created and developed whereby the proposed system and framework of basic rules are formulated to be adopted as a guide for predicting the earned value indexes in a modular architecture with several components. The research methodology followed throughout this study is illustrated in Figure (1).

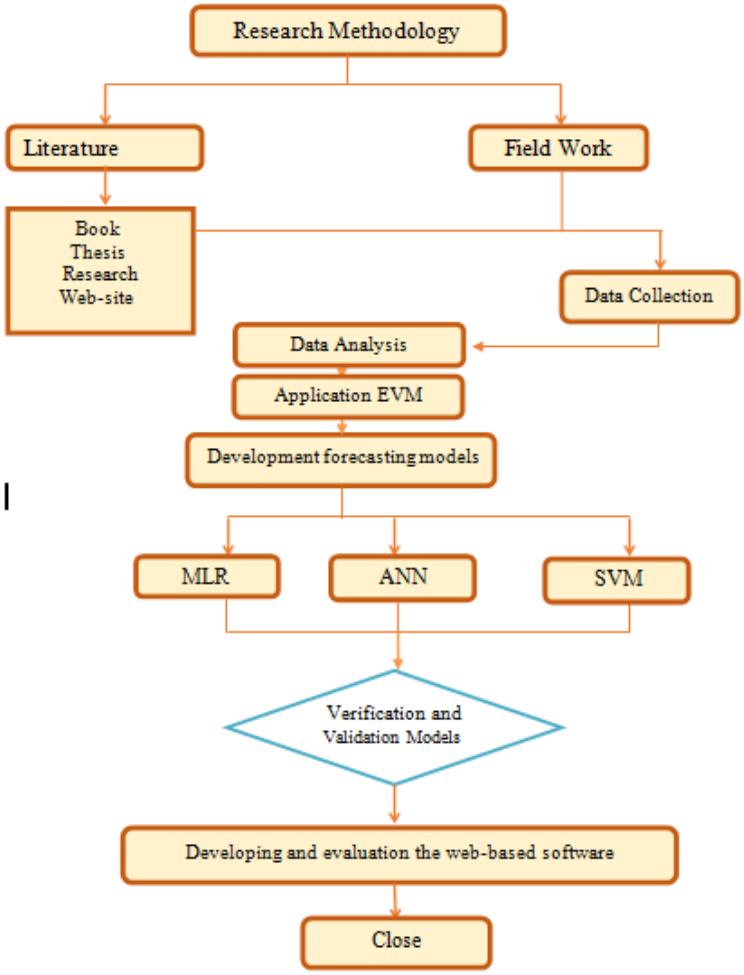

Figure 1: Research Methodology.

Conclusions

This studied focused on the prediction performance measurement of residential buildings using machine intelligence techniques like MLR and SVM. The outcomes of this research are quite compelling, and thus, it is possible to draw the following conclusions:

1. In comparison with other methods, it has been noticed that the SVM method shows excellent outcomes of prediction.

2. The results of this investigation show that the MLR technique has been used to build the prediction model for EVM by using SPSS software. It was found that the MLR technique showed good results of estimation in terms of (AA%) and (MAPE) generated by the MLR model for SPI, CPI and TCPI, where the AA% values were 95.89%, 96.89%, and 95.91%, and the MAPE values were 4.11%, 3.11% and 4.09% for SPI,CPI, and TCPI respectively. In order to check the verification of the resulted prediction model, data has been collected on different projects in Iraq, which have already been accomplished. The prediction model shows almost the same results, but there are few differences

between the theoretical and the practical results.

3. The SVM technique was used to create a new prediction model by applying the SMOreg algorithm through WEKA software. In this technique. The results were interpreted in terms of (AA%) which were equal to 94.12%, 71.76%, and 84.82%, and (MAPE) equal to 5.88%, 28.24% and 15.18% for SPI, CPI and TCPI, respectively.
4. It was found that the prediction model derived from the SVM technique indicates that there are a few variances between the theoretical and the practical results.
5. The results above are completely similar to the results obtained from models, which shows how accurate the web-based software is so it could be used to predict earned value indexes. This software can be used to obtain prediction results quickly, with excellent accuracy and less effort.
6. To ease the application of the proposed methods for forecast future behaviour based on current and past outcomes, the results of web-based software were interpreted in terms of (AA%) equal to 95.89%, 96.89% and 95.91% for SPI, CPI and TCPI, respectively by MLR technique, (AA%) equal to 94.12%, 71.76% and 84.82% for SPI, CPI and TCPI respectively by SVM technique. The results above are completely similar to the results obtained from models, and this shows how accurate the web-based software is so it could be used to predict earned value indexes. This software can be used to obtain prediction results quickly, with excellent accuracy and less effort as compared to alternative methods.

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2. The Availability of Data

The study findings, which are supported by the data, are obtainable by the corresponding writer upon request.

3. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Urban regeneration through Climate Adaptive Design for the Mediterranean area

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Abstract

Seventy percent of cities globally are already dealing with Climate Change, and studies and research have proven various harmful effects on urban and human health due to extreme weather conditions (Heaviside C., 2017). The global and European goals for 2030 and 2050 aim at becoming a climate-resilient society by strengthening and promoting the adoption of solutions that protect nature and biodiversity while ensuring a just, healthy, and environmentally friendly environment (2030 Agenda for Sustainable Development, 2015; Paris Agreement, 2017; European Green Deal, 2019).

Facing these challenges is complex and requires a holistic approach, raising the question: How can we create adaptive strategies and solutions that simultaneously tackle environmental, functional, and societal issues while assessing climate change's effects on public space? The article explores this question through a case study of a square redevelopment in Florence, Italy, with the aim to demonstrate how systems thinking methodology can increase the resilience of the public spaces located in the Mediterranean area.

The article examines the redevelopment of a currently degraded and underused urban area by implementing Nature-based Solutions (NbS) and equipping it with new functions (art, education, play, recreation, etc.) that contribute to heat stress reduction at a micro-urban scale and improve social inclusion and biodiversity in the urban context. To tackle this challenge and ensure an integrated approach, we applied the Symbiosis in Development (SiD), a practical framework based on systems- and design thinking.

Keywords

Urban regeneration; Nature-based solutions; Climate adaptive design; Design thinking; Systems thinking.

Introduction

Climate Change (CC) continues to be a severe challenge for communities around the world. Cities are particularly vulnerable to the effects of the CC, with the risk of extreme weather conditions, such as floods and heatwaves increasing every year (World Economic Forum, 2021). Seventy percent of cities worldwide are already dealing with the effects of CC, and studies and research have proven various direct and indirect harmful effects on urban and human health due to extreme weather conditions (Heaviside C., Macintyre H., Vardoulakis S., 2017). Air pollution, loss in biodiversity, and ocean acidification are just some of the indirect effects of the CC on human health, while direct effects, heatwaves, and floods, create additional socio-economic effects (European Commission, 2020).

With CC among the primary causes of the Urban Heat Island (UHI) and flooding in cities, designers and planners are urged to address the related issues to mitigate its effects and create adaptive solutions. The response of urban planning to UHI-related risks includes approaches to neighborhoods and streetscape design such as Nature-based Solutions (NbS), Ecosystem services (ES), Blue-green infrastructure (BGI) (European Commission, 2015; Except Integrated Sustainability, 2019; European Environmental Agency, 2020).

Besides the CC, population growth, rapid urbanization, resource depletion, economic and sanitary crisis have a tool on cities, their public space, and the quality of life (Gebalska B.A, 2017). Creating a climate-resilient urban environment is becoming one of the crucial aspects of architecture and urban planning and one of the global and

European Goals for 2030 and 2050 (2030 Agenda for Sustainable Development, 2015; Paris Agreement, 2017; European Green Deal, 2019).

As a response to these megatrends, there is a visible change in city development approaches towards a more human and nature centered-approach (walkable cities, inclusive cities, healthy cities, green cities, smart cities, etc.) and the importance of putting the human right to both health and a healthy environment at the center of the debate (Carlarne C., 2019). Reaching these ambitious goals and achieving a truly integrated sustainability capable of answering all the challenges requires a new way of thinking, analyzing, and designing our cities. Moving away from a linear way of thinking towards a Systems Thinking (ST) allows the shift from simplistic approaches that tackle one or just a few challenges at a time to understanding the core causes of the problems, their interrelations, and help integrate environmental, social, economic, and ecological aspects (Gonella F., 2020). It has never been so important and necessary to look at a city from a holistic perspective and re-design our spaces in close collaboration with all stakeholders within a trans-disciplinary team.

Based on these considerations, this work aims to demonstrate how Systems Thinking methodology can help tackle these complex challenges and increase the resilience of the public spaces through Symbiosis in Development (SiD) approach, a practical framework based on Systems- and Design Thinking, applied to a case study in the Mediterranean area.

The paper is organized as follows: firstly, a description of the SiD framework followed by explaining some of its main components: a) SiD Process; b) SiD Method; and c) System Mapping. Secondly, the case study area to which the framework is applied is introduced. Thirdly, results comparing two meta-design proposals are presented and discussed. Finally, potential future work is presented, followed by the conclusions.

Conclusions & Future developments

The quality of urban development depends on many aspects, such as microclimatic conditions and the social and programmatic value that it offers. However, improving outdoor comfort and lowering the outdoor temperatures in the summer period is one of the main challenges, specifically in Mediterranean cities. In the past few decades, climate change and its effects have been one of the most discussed topics, together with the attention on greening our cities and redeveloping public spaces. Nevertheless, the implementation of both adaptation and mitigation strategies is relatively slow due to economic and political challenges.

Furthermore, designing and re-designing public space nowadays implies many challenges of a complex nature that require a multidisciplinary approach and close collaboration with all stakeholders. Applying a holistic approach to tackle city resilience challenges and ensure incorporating solutions is of great importance. Symbiosis in Development (SiD) framework is an approach developed to meet these needs and support multidisciplinary teams in reaching integrated systemic solutions; it allows flexibility in its application and integration of various tools, such as ENVI-met for the simulation and valuation of the microclimatic conditions. The Full spectrum analysis has helped evaluate all aspects of Carlo Dolci's system' and highlight the opportunities and the challenges that were not visible at first sight. One of the interesting points that came out of the first analysis is related to the temporality and the improvement of the climate-adaptive solutions, consequently leading to the reflection on the modality of the implementation and the flexibility of the proposed meta-design solutions.

The presented study shows that urban outdoor comfort can be improved in the short term with small interventions that combine the NbS with urban furniture enriching the public space with social activities. In addition, the simulations with ENVI-met confirm the benefits of the proposed solutions in terms of improved climatic conditions and outdoor comfort for pedestrians due to the introduction of vegetation and water elements. In addition, the application of both systems and design thinking approach through the SiD framework has shown as a handy tool able to tackle complex challenges, and it can become a valuable framework for inter and multidisciplinary teams. Finally, the quality of the process has contributed to increasing the cognitive understanding and maturity of the designers and students, allowing them to integrate the knowledge from other disciplines and perspectives.

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A vision towards development: interpreting the architectural heritage of Sinincay (Cuenca, Ecuador)

Researcher Amanda García

Abstract:

Cuenca (Ecuador) is a dispersed city, in whose proximity population centers such as Sinincay, have developed conditioned to socio-spatial, political and economic factors, limiting the valuation, treatment, and conservation of cultural heritage, as well as citizen well-being. In this sense, the present research seeks to describe the state of conservation of the heritage architecture of the Sinincay parish center, and promote its preservation from its condition of development resource.

Thirteen real estate properties are studied from the application of urban-architectural valuation files and environmental tools, in both cases combined with the landscape category. The analysis considers the phases of: preparation, analysis / diagnosis, prioritization and action plan in different development-oriented scenarios. The predominant typology is continuous in the urban grid corresponding to the period 1900 - 1999 of a domestic nature and based on volumes of orthogonal pattern whose formal variations have made the portal stand out since 1930. In addition, it includes the use of wood and adobe in a regular state of conservation depending on the moderate environmental impact and anthropic activity.

At term, it is determined that the aptitude of the assets as a development resource frames 31% as partially suitable, and the rest as suitable. As a particular variable, the relationship with the local landscape in its quality between regular and medium-high is projected as ideal to enhance the vocation of interventions. The pilot plan guides this process by combining the physical capacity and aptitude of the selected cases.

KEYWORDS:

architectural heritage, peripheral heritage, architectural morpho-typology, heritage conservation, development resource.

Urban Planning and Architectural Design for Sustainable Development

Proceedings of Urban Planning and Architectural Design for Sustainable Development (UPADSD) – 6th Edition 2021

This book is a collection of innovative research submitted to the 6th international conference on Urban Planning & Architectural Design for Sustainable Development, as well as the 1st edition of the Circular Economy for Sustainable Development. It provides a brief glimpse into the measures that need to be taken to achieve a sustainable urban planning and development in a post-COVID world as well as preserve and manage our cultural heritage, improve energy efficiency in buildings and address issues of urban infrastructure.

Over the past two years, urban vulnerabilities and underlying patterns and effects of the pandemic have been the focus of research published. In this abstracts book, we showcase valuable insights of researchers across the globe who introduce urban models for a post-COVID future, investigate user behaviors towards public building designs and public transport systems and contribute to the development of pandemic-resilient urban development.

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