

© 2024, editores: *Salvador García-Ayllón Veintimilla y José Luis Miralles García*
© 2024, *Universidad Politécnica de Cartagena*

Ediciones UPCT
Plaza del Hospital, 1
30202, Cartagena
Tel. 968325908

Correo-e: ediciones@upct.es

Primera edición, marzo 2024

ISBN: 978-84-17853-82-2



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SECOND INTERNATIONAL CONFERENCE ON FUTURE CHALLENGES
IN SUSTAINABLE URBAN PLANNING & TERRITORIAL MANAGEMENT

SUPTM 2024

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The Technical University of Cartagena is an institution with an unwavering commitment to sustainability, the environment, urban studies and proper land-use planning. Hosting the second international conference on the challenges of the 21st-century in urban planning and land management, SUPTM 2024, is a privilege for us as a scientific and academic institution.

As one of the four technical universities in Spain, our students and researchers are deeply engaged in these disciplines through various academic programmes and research initiatives. City design, urban mobility, environmental and territorial planning, and natural disaster management, such as flood control and preservation of coastal space, are areas where our institution excels nationally and internationally. Every year, we graduate numerous professionals who bring their expertise to diverse fields.

Research in these critical areas is essential for the future of the planet and must be prioritised by society, supported by public administrations, and disseminated to industries through knowledge transfer. I reaffirm our institution's unwavering commitment to participating in international knowledge sharing events, which empower our researchers and facilitate collaboration with peers.

I am confident that this conference marks the beginning of a series of meetings that will drive progress towards our planet's sustainable development goals.

Beatriz Miguel
Rector of the Technical University of Cartagena



It is a pride for the city of Cartagena to host this second international conference on challenges in urban planning and land management SUPTM 2024. The city of Cartagena, as the cradle of a three-thousand-year-old civilization, is a historical reference in terms of architecture and urban planning. However, we are not resigned to living from our past, but rather we are committed to a future in which innovation and research are the spearhead to help move our society forward.

In this sense, our city is a reference in sustainable urban mobility, environmental planning and innovative architecture, incorporating researchers and professionals of the highest prestige into our projects. These projects have placed our city in a vanguard position in many of the topics that will be discussed during these days in this congress. In this sense, I am convinced that the results of this meeting will be very useful and will help our cities and territories to advance along the path of sustainable development.

I am confident that the success of this first call is only the beginning of new meetings in the future that will consolidate our city as a benchmark in terms of research on urban planning and land-use planning. And I am sure that in the near future, the more than 200 researchers from the five continents who will meet electronically these days, will be able to come and see our wonderful city in person at the next edition of the congress, which we will be happy to invite you to.

Noelia Arroyo
Mayor of Cartagena



PREFACE

For many years now, the scientific community has warned of the need to evolve the social and economic activities of our societies around the world towards a situation of ecological balance with the ecosystems that produce the environmental services that these activities consume. And this, in addition, maintaining a fair distribution of wealth so that the evolution towards that ecological balance does not generate greater differences in economic development between the different countries of the planet. This is the great challenge that humanity faces in the coming decades.



Furthermore, every social or economic activity generates its own land demand for associated uses in the city and territory, sometimes competing with ecosystem uses that generate essential environmental services or altering them and modifying the urban and territorial morphology and landscape.



According to the United Nations, the urban population will concentrate up to 70% in urban areas in the coming years, and this means, as many authors highlight, that the economic and social transformation towards a sustainable society, and the achievement the United Nations SDG, it will only be managed if sustainable cities are achieved in ecological balance with the territory that provides essential environmental services.

In this context, the 2nd International Conference on Future Challenges in Sustainable Urban Planning & Territorial Management (SUPTM 2024), whose proceedings are published in this book, wants to be a scientific contribution to the great challenge of sustainability that humanity faces in the coming decades. A space for thought, the exchange of experiences and action.

In the process towards an economic activity based on ecological balance, urban and territorial planning is an essential and irreplaceable instrument since, unlike other areas of the economy in which errors in the production of goods and services can be corrected, in the field of the location of uses and activities in the city and the territory, mistakes in said decisions either cannot be corrected or their correction is very economically expensive and requires a lot of time. Therefore, it is, in any case, better to prevent through urban and territorial planning to guarantee the maintenance of the production of environmental services. The poor planning of activities, such as developing industrial or a tourist areas in zones where essential

environmental services are produced, implies a territorial transformation that is practically unaffordable or even impossible to reverse, and consequently a production loss of environmental services. A sustainable urban and territorial planning is only possible if there is simultaneously an administrative organization able to enforcing it, especially in its environmental dimensions, and particularly the protection of areas with some environmental values, locating urban developments in areas compatible with the maintenance of said ecological assets.

The researchers who deal with urban and territorial sustainability in any of its many facets is very aware of this, as is evident in the high participation that has occurred in this conference as well as in the great variety of topics discussed. It is therefore evident, on a global scale, of the great concern that exists in humanity about these issues and, at the same time, it shows the need to share knowledge, experiences, analysis, proposals... In our scientific field, knowledge is often generated locally as a way to generate universal rules. Local analysis and experiences allow us to learn about similar situations in societies that apparently are very different, and to generate global knowledge.

Urban and territorial sustainability will be global, or it will not be. The major environmental problems that exist on our only planet require, in many cases, comprehensive global solutions. In this framework, research in our field plays a fundamental role. As an example, aspects such as the emission of greenhouse gases, which in a significant part occur in the transportation sector, require a transition towards widespread sustainable mobility. And of course, these transformation processes should not produce an increase in wealth differences between the different countries of the world.

A huge job to do, a huge task ahead, a great challenge that humanity has never faced. Our collective, with the contributions of our research, plays an essential role.

At the same time, many scholars and scientists who share their research in this conference are academics who also fulfill the function of transmitting the acquired knowledge to new generations. Again, in this area we also face a great challenge. It is the challenge of global learning thorough systems such as Collaborative Online International Learning, so that new generations learn to live and share with students from any other university in the world, and to address global challenges collaboratively, thus generating a New Ecological Paradigm global.

We hope that humanity will be able to generate and apply the knowledge that constitutes this New Ecological Paradigm to achieve a balanced world in its economic development that must necessarily be based on a local and global ecological balance.

Salvador García-Ayllón & José Luis Miralles
Chairs of the SUPTM 2024 conference

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What is innovation in architectural and urban design in waterfront cities?

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Abstract: The world is changing rapidly and the need to adopt sustainable behaviour is increasingly urgent, not just in architecture. Is it possible to innovate while making conscious and responsible choices? Technological innovation is not necessarily green and alone is not the solution to problems but, paradoxically, if not well directed, it can become a problem to solutions. Innovation is just a tool and, to be truly sustainable, must start from design. In this context, the concrete case of water cities is analysed. They require a peculiar approach precisely because of the presence of the water element.

Keywords: Waterfront Regeneration, Waterfront Sustainability, Architectural and Urban Regeneration, Architectural innovation, Fake innovation

1. Introduction. The responsibility for innovation that is not always green.

Architecture is in its essence the management and construction of space. The *punctum dolens* is that space is a very precious material and, overwhelmed by the race for the latest innovation, we are all losing the ability and skill to shape it. The world is changing rapidly, and the need, not only in architecture, to adopt sustainable behaviour is increasingly evident and urgent. Is it possible to innovate while making conscious and responsible choices? There is no doubt that construction is a key sector for the economy and for the achievement of an emission-free world and that, in this field, innovation, industrialisation, digitalisation, and sustainability, with the consequent application of cutting-edge technologies, methods and systems, allows an exponential leap forward. But we must be aware that technological innovation is not necessarily green. Innovation alone is not the 'solution to problems'; paradoxically, if not well addressed and conveyed, it can become a 'problem to solutions'. It is precisely in construction and architecture, unfortunately, that in recent years we often witness pseudo eco-initiatives because of poorly used materials or the choice to build forgetting the techniques of the past to insert technological innovations where they are not needed. Urban and architectural design and microclimate are closely related. The real challenge today is not just knowing new technologies, but knowing how to combine them skilfully. Innovation is just a tool that needs to be known, addressed and controlled. It is a cultural challenge that requires knowledge and a love of architecture. Architectural and urban design must not chase innovation. The role of the architect is precisely this: to check at all times that innovation remains green, that from an equation it does not become an inequation. Unfortunately, in recent years, particularly in the design the micro and macro architecture of private individuals, we see surreal interventions such as: thermal insulation (only suitable for certain locations) on stone structures in Sicily by the sea (which will age easily as well as not living healthily);

Citation: Vicari Aversa, C.S.; What is innovation in urban and architectural design in waterfront cities? *SUPTM 2024 conference proceedings* sciforum-082008.

<https://doi.org/10.31428/10317/13566>

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constructing winter gardens in terraces facing south, instead of creating shading or pergolas, and then having to put the air conditioner; realising interior distribution without controlling natural light, exposure and ventilation; elaborate technological research that results in the invention of skins that nullify the dialogue between the building's façade and its interior character, thus realising envelopes that dialogue more (if it goes well) with the outside world than with the interior space (but architecture is like a body and the skin must be an integral part of it and must be appropriate to the context); making vegetal walls or adding trees on balconies, believing that is enough to be green, almost wearing vegetal burqas, as if this is what makes an architecture green or beautiful. *"A doctor can bury his mistakes but an architect can only advise his client to plant vines,"* F. L. Wright argued. A new fashion, 'vegetecture' as G. Peluffo calls it, adding that *"No building can be so weak that it needs to represent an ecological awareness that is now obvious and inevitable."* Even worse is to do this where there is a shortage of water. If maintaining the vegetation unreasonably affects costs and resources, perhaps we have missed a few steps. We have gone at the opposite to the one of sustainability we were trying to pursue [1].

It is often enough to go back to common sense, good building skills, traditional forms of ventilation and cooling and/or the need for heat storage that is perfectly compatible with architecture. The real challenge today is not only to know the new technologies but to know how to combine them wisely. The results of many projects show that just that caught up in the eagerness for the new, we often paradoxically find ourselves with architecture that suddenly grows old easily. Innovating does not necessarily, or only, mean resorting to domotics, BIM or green roofing, thus thinking of doing architecture or solving problems. It means starting again from the knowledge handed down from the past, often preserved in many cases of popular architecture, to translate it, thanks to new tools, into the new architecture. It is not possible to have a single, innovative answer for everyone. Let us think, for example, of the Greek-Roman Theatre in Taormina, set in a panoramic spot that is not only marvellous but always naturally ventilated because the Greeks and Romans knew where how, and with what orientation to build. Sustainability was not the result of mechanical calculations but of ancient knowledge and common sense. These are passed on, studied, immediately reusable, and they do not need to be disposed of. And we should set aside this ancient knowledge? No, true innovation is to pass them on, innovating them.

Urban and architectural design and the microclimate are closely related. Various and varied can be suggestions for promoting a sustainable project, something to which the importance of the choice of materials must necessarily be connected. In this the architect must operate like a chef, preferably working with local raw materials, thinking about their availability. The process of cooking has much to do with designing and building. One must always think of the best ingredients and with the necessary, never something more or less. You always have to control the time, the process, the various steps, and the moments when more dedication is required during placement. And, just as it is not an appliance without the rest that makes a dinner party, similarly it is not innovation that makes an architecture. Perhaps this gives a better idea of what innovation is. There are some examples realised thanks to designers who have managed to apply this approach; the world's greenest waste-

to-energy plant (CopenHill waste-to-energy plant, Copenhagen, 2019, by BIG & SLA) or redeveloping a former coal-fired power station, the largest brick building in Europe. (Battersea Power Station, WilkinsonEyre, London, 2022, masterplan by R. Viñoly).

2. What to (try to) do?

Keeping the memory active [2], knowing the past to advance in the future through ductility. Design can only be developed through a profound and conscious knowledge of the past, prodromal to the design of the future. Cleverly combining, as a part absorbed by the designer like the sun tanning the skin, the past with the present of technologies with the aim not to show off one's own culture, which must remain in the background, between the lines, of the design. E. N. Rogers questioned the importance of tradition and environmental pre-existences and wondered how new architecture could be at the same time a spokesman of its time and fit harmoniously into the existing historical fabric, tradition and history. With knowledge and ... innovation. *"To learn history to the point of forgetting it. Like when you learn the normal rules of mathematics and geometry"* [3].

This same approach, obviously to be calibrated on a case-by-case basis, cannot then suddenly be lost when focusing on coastal communities and cities [4]. They require a peculiar approach precisely because of the presence of the element water. This on the one hand, can be an obvious resource and facilitate sustainability in urban recovery and regeneration projects but, on the other hand, can sometimes prove to be a complication that, if poorly managed, can cause some green and sustainable solutions to turn out to be unusable or aberrant. Yet, studying them, to an attentive eye accustomed to reading them, can often be much simpler than one would think. One has to go to their inner nature. Are they predominantly port cities? Open or closed to the sea? Fluvial? Lakeside? Tourist cities? Beach towns? According to the UN-Habitat Programme, as many as two out of every five people in the world live within 100 km of the coast and 90 per cent of megacities are vulnerable to sea-level rise. A study published in the scientific journal *Nature Communications* indicates that between 1993 and 2015, the risk of coastal flooding had increased by almost 50 per cent globally. The future of our coasts does not look too optimistic. This means that these people, along with their homes, businesses and communities, may soon no longer exist due to the accelerating impacts of climate change. While facing the greatest risks, coastal cities are home to 11 per cent of the world's population. In this perspective, the climate crisis is showing its negative effects. The latest report of the Intergovernmental Panel on Climate Change concludes that the world temperature is already 1.1°C above pre-industrial levels and is likely to exceed the critical tipping point of 1.5°C by 2035. Rising sea levels threaten one hundred million people in coastal communities. [5]. Climate change is, therefore, a peculiar threat to coastal cities amplified by the rapid rate of urbanisation [6]. Such a context makes clear the contemporary design complexity in coastal cities whose urban spaces on the edge are almost always their most identifiable spaces. Only in this way it will be possible to consolidate social, economic and environmental benefits by achieving interaction between man and his surroundings, as well as aesthetics and sight [7].

Such reasoning can be exemplified with a recent project in Palermo, Sicily, the Palermo Marina Yachting (PMY), a new piece, after the Foro Italico spaces, of an "all Port" city that had been raped on the maritime edge over the years. Time will confirm the effectiveness of the intervention, but one fact is already consolidated. An area, that of the Castle by the sea, has been symbolically enhanced, conserving and symbolically enhancing its trapezoidal shape, recovering its historical heritage and integrating it with the needs of modern cruise tourism (with the related logistics) and tourism, not only exogenous, that is, from outside the city, but also endogenous, making it a place for the people of Palermo to 'take a trip out of town' on their sea (Figure 1).



Figure 1. Palermo Marina Yachting (PMY), Render. Source: Giornale della Vela. Photo, November 2023, by Giuseppe Vicari.

3. Conclusion. So what is innovation in architecture in seaside cities and what is the role of the architect?

It is knowing how to put the "pieces together", as Ludovico Quaroni wrote, even those distant from each other to move forward. "*The realisation of a precise building design introduces into the existing environment an alteration that will be all the greater the larger the area directly affected and the greater the difference between volumes, surfaces, lines, colours ...*" [8]. Innovation, especially on the varied but delicate edge between land and sea, urged by opposing tensions, is to elaborate a project that is sustainable because it is aware of the complexity, with the help of the new tools, without using them unconditionally, but with judgement, like a chef to ensure that the result is the best possible for all. This is how the extraordinary polyphonic energy of architecture is experienced.

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