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Urban Morphology in Coastal Cities

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***Abstract*—** *In a close future, in which cultural heritage will represent a path with historical value and will be studied by the aesthetic, ethnological or anthropological point of view, the urban rehabilitation will appear as a commitment between the past and the present (future) and the sustainable, inclusive and intelligent development. Linking all these elements with all of different characteristics, from an objective point of view, the investigation will not seek miraculous solutions to old difficulties of spatial planning or rapid resolution of emerging problems, because more than expanding the generalist field of knowledge or giving a new academic precision to an empirical approach, the research aims to deepen scientific knowledge about the fishing settlements located on the border line provided by the sea line, and about the rural settlements delimited by the plow wake that once furrowed the land, with resilient particularities achieved in an unique and shared ambience because we will support the investigation in this "living-lab" and reply this research as a model on similar large-scale environments on Earth.*

I. INTRODUCTION

Coastal cities are prioritized and relevant to climate change, sea-level rise, temperature and natural disaster monitoring, and the development of potential solutions to emerging urban problems. These points are very relevant to our investigation because even though the investigation will not seek miraculous solutions to old difficulties of spatial planning or rapid resolution of emerging problems, it will link the knowledge about the future and anticipate the changes drawing urban plans, planning and rebuilding coastal cities conserving their identity, their genius loci and make advances that in the "time of change" seems to be empirical.

II. UNITED NATIONS SUSTAINABLE DEVELOPMENT

The 2030 Agenda for Sustainable Development, "adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests." [1] We believe that in 2030 we will achieve 17 goals, 169 targets, 3506 events, 1326 publications and 6499 actions. In these objectives are particularly relevant to this investigation the 11th and 13th goals. The 11th goal, as we can overview in fig. 1, has the priority to make cities and human settlements inclusive, safe, resilient and sustainable. It is mandatory that we can build a better world in habitation (safety, accessible price, better sanitary conditions), in transportation, in the protection of cultural and natural heritage, the reduction of

people affected by catastrophes, build better and safer public space, in others. The DRR (disaster risk reduction) in a major part of our future development because we need to build cities and settlements in a solid ground.

Fig. 1 - Overview of the 11th goal of UN

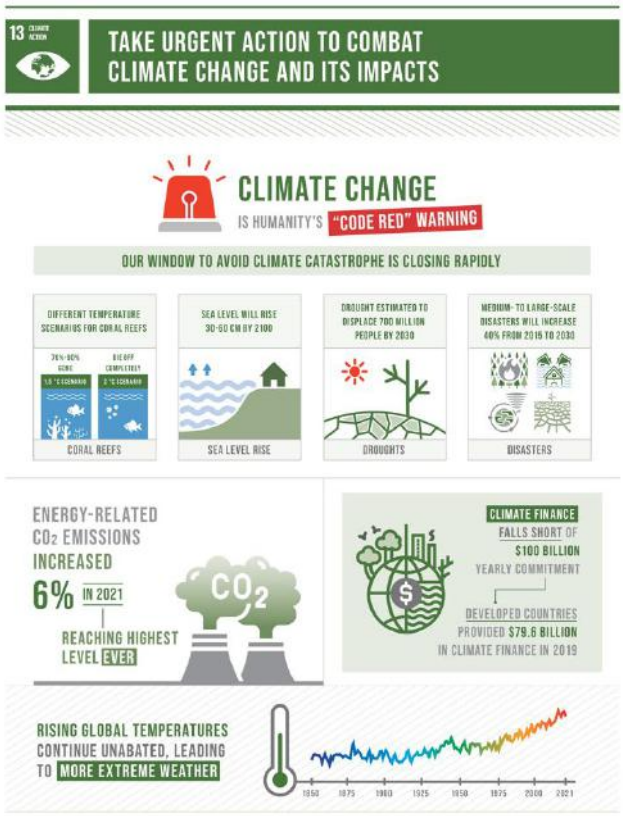

Fig. 2 - Overview of the 13th goal of UN

The 13th goal, as we can overview in fig. 2, has to take urgent action to combat climate change and their impacts. This goal is particularly important to reinforce the resilience and the capability to adopt to the risks related to clime and natural catastrophes in all countries relating politics with research and strategies e national planning.

It´s very important to all countries and municipalities that integrate in education the conscience about the measures of mitigation, adaptation and reduction of impact and earlier alert in what concerns to climate changes and the impact in population life's.

III. CASE STUDY: MUNICIPALITY OF MATOSINHOS, PORTUGAL

In the Sustainable Development Goals Report 2022 says that "According to the Report, cascading and interlinked crises are putting the 2030 Agenda for Sustainable Development in grave danger, along with humanity's very own survival. The Report highlights the severity and magnitude of the challenges before us. The confluence of crises, dominated by COVID-19, climate change, and conflicts, are creating spin-off impacts on food and nutrition, health, education, the environment, and peace and security, and affecting all the Sustainable Development Goals (SDGs). The Report details the reversal of years of progress in eradicating poverty and hunger, improving health and education, providing basic services, and much more. It also points out areas that need urgent action in order to rescue the SDGs and deliver meaningful progress for people and the planet by 2030." [2]

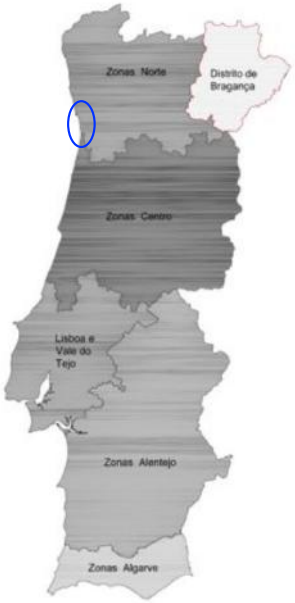

Fig. 3 – Map of Portugal with location of Matosinhos Municipality

With all this knowledge in mind the relevance of the research project with scientific support centered on smart cities, sustainability and urban regeneration, to be developed around the fishing settlements and diffuse rural core, located in the sea coast of North of Portugal territory, in the Union of the Parishes of Perafita, Lavra and Santa Cruz do Bispo, in the Municipality of Matosinhos, pointed in fig. 3, will be understood here in the dialectical perspective of an open work related with high impact of climate change, sea-level rise, developing solutions to emerging problems, recovering the interaction between formal logic and dialectical logic and in between diachronic and synchronous readings, which seek to deepen scientific knowledge about:

1. Coastal places and cores that correspond to the old fishing and rural settlements and the analysis of their morphological and functional characteristics;
2. Meshes and axes that correspond to the growth processes of the primitive cores related to sea-level rise;

3. Connection between urban fishing subsystems, diffuse rural and periurban cores in a perspective of resilience and sustainability developing solutions to design a smart green city;
4. Urban regeneration processes within a framework of strategic convergence that values the development of inclusive citizenship processes responding with solutions to emerging urban problems.

5. Urban regeneration sustained by the development of transportation systems and internet-of-things connectivity.
6. Estimative of the impact of climate changes and the development of different policies and strategies that minimize the risks.

IV. SEA LEVEL RISE

This topic included in the 13th goal of the UN Sustainable Development underline that "the world is on the brink of a climate catastrophe, and the window to avert it is closing rapidly. Increased heatwaves, droughts and floods caused by climate change are already affecting billions of people around the world and causing potentially irreversible changes in global ecosystems.

To limit warming to 1.5° Celsius above pre-industrial levels, as set out in the Paris Agreement, global greenhouse gas emissions will need to peak before 2025. Then they must decline by 43 per cent by 2030, falling to net zero by 2050, according to the Intergovernmental Panel on Climate Change (IPCC), the United Nations body responsible for assessing the science related to climate change. In response, countries are articulating climate action plans to cut emissions and adapt to climate impacts through nationally determined contributions. However, current national commitments are not sufficient to meet the 1.5 °C target. Under these commitments, greenhouse gas emissions are projected to increase by almost 14 per cent over the next decade. Immediate and deep reductions in emissions are needed across all sectors to move from a tipping point headed to climate calamity to a turning point for a sustainable future." [3]

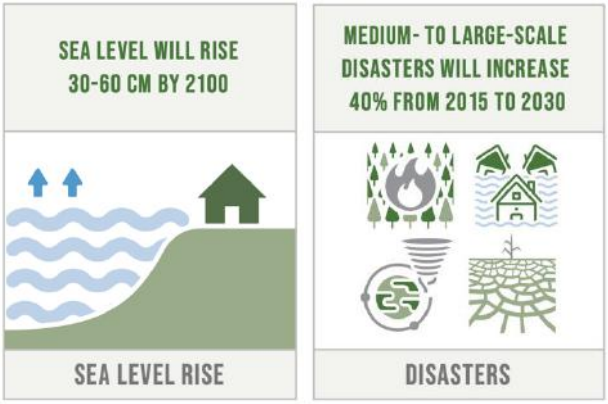

Fig. 4 – Previsions of natural disasters

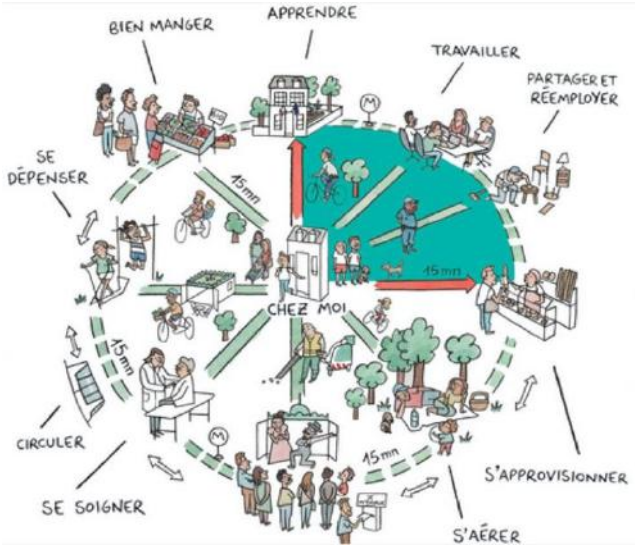

Fig. 5 – City of 15 minutes by Prof. Doutor Carlos Moreno

All this Knowledge allow us to work on these emerging problems developing models that treat coastal places in a very attractive places to live, to invest and to create families and children. It is possible in this case study in Municipality of Matosinhos to create a 15' city with Carlos Moreno [4] principles adding to old fishing and rural settlements the agricultural places very characteristics in that area.

In the wake of the Covid-19 pandemic, our lifestyle, our work, family and leisure routines, among others, were profoundly modified by introducing the online model and in some cases hybrid, which uncovered the time and resources we spend on a daily to move, wasting time to

really have quality of life. These premises, which would take years to be perceived by society, were incorporated by the population at a glance, bringing Carlos Moreno's concept of city to the order of the day. "This is a revolutionary concept. It is the possibility of fighting climate change and at the same time changing our lifestyle. It is the opportunity to have more peace, greener streets, walk or cycle, shop close to home, have access to multiple services, etc. But what is the city of 15 minutes? The idea is to transform the cities we currently have into cities that serve people and not cars. from a central city to a polycentric model, with decentralized services, which people reach in 15 minutes on foot or by bicycle, namely the six essential aspects of our lives, such as working, going to school, medical services, places to do shopping and leisure spaces." [5]

V. CONCLUSION

This paper reports a work in progress under a research project under the title: Urban Morphology and Sustainability: Piscal and Settlements and Diffuered Rural Nucleous. This work will be developed in three years and the work we are presenting here refers to phase one where we prepare the general framework of the territory in the local and regional context; is secure to affirm that if we don't plan our coastal cities we will loose valuable heritage, but fortunately with all efforts developed under the theme we can predict some future and act before.

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