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of the

INTERNATIONAL CONFERENCE

on

CHANGING CITIES III

Spatial, Design, Landscape & Socio-economic Dimensions

Under the aegis of

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FORWARD

The 1st international conference on 'Changing Cities', which was hosted on Skiathos island, 18-22 June 2013, had started as an idea in 2012. The initial concept was to organise an academic event creative, inspiring, stimulating, and above all, international. There had been a belief that such an academic event may contribute in revitalizing academia and promoting tourism in Greece - hit by the economic crisis of public debt in the Eurozone. Given that during the last years, both societies and cities in Greece have been dramatically changing, shrinking in economic, spatial and demographic terms, we have chosen Changing Cities as the main theme of this series of conferences. Our aspiration had been to provide an international forum for transaction of ideas on cities and bring together architects, urban designers, landscape designers, urban planners, urban geographers, urban economists, urban sociologists and demographers, to investigate new challenges. This goal became a reality since the 1st Changing Cities conference gained strong interest of academics and researchers from many countries and regions around the world; Greece and the Balkans, south Europe and Mediterranean countries, northwest Europe, Middle East and Asia, Far East, North America, Latin America and Africa. A total of about 460 abstracts and 320 papers had been submitted in the conference – most of them, about 60% from abroad.

The 2nd Changing Cities conference, Porto Heli, Peloponnese, Greece, 22-26 June 2015, was also fruitful academically since it attracted the attention of scholars, not only from Greece, the Balkans and Europe, but also from far-away countries like USA and Canada, Brazil, Chile, Colombia in Latin America, and China, Japan and Australia in the far-east. We received about 500 abstracts and more than 350 papers. Among the scholars participating, there were about 185 Greek academics and researchers. This indicated that despite shortage of research funds, salary cuts, and broken morale, university teachers and researchers in Greek state universities were trying hard to keep a high-level academic status. Besides, the number of contributions by scholars from abroad (63%) emphatically pointed the international character of the conference.

The results of the 3rd Changing Cities conference, Syros Island, Greece, 26-30 June 2017, points that the series of conferences on Changing Cities is getting established in the international academia as a significant bi-annual international forum. We have received 485 abstracts and 200 papers from many countries around the globe – honouring our efforts as Organising Committee. The contribution by Greek researchers and scholars is 27.42% while that of foreign academics reaches 72.58%; this indicates the international character of the conference. Regarding foreign academics, many of them are from neighbouring countries such as Italy (69), Turkey (37), Cyprus (11), and

Serbia (6); but also many are from distant countries such as Brazil (27), USA (16), UK (16), Poland (11), and Netherlands (10).

The strong interest for this conference by academic communities allows us to have thoughts about organising the 4th Changing Cities conferences in two years' time, spatially hosted in a different Greek sea resort – probably Santorini Island, or Crete.

I would like first to thank the Organising Committee, the keynote speakers, and the members of the international scientific board who supported enthusiastically the academic organization of this conference. I would especially like to thank those colleagues of the Scientific Committee who have also pre-organized special sessions in this conference. I would like to thank all the academic, political and scientific organisations which supported this conference in many different ways: University of Thessaly; The Municipal Authority of Syros Island; the Greek Ministry of Tourism; The Greek National Tourism Organisation (GNTO); Finally, I would like to thank the shipping companies 'Blue Star Ferries' and 'SuperFast Ferries' which sponsored sea travel to and from Syros Island.

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KEYNOTES SPEECHES

Urban natures for urban resilience. Time-phases design for Changing Cities.

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Abstract

Within the urban nature's framework, the territory's geomorphic changes due to climate change and how the build environment interacts with these spaces are of paramount importance. Specifically, the objective is to highlight how, in certain circumstances, the strong link between architecture and nature can result in a clear domination of one part on the other. This needs to be taken into account when considering the planning strategies to adopt in a specified area in order to re-establish the right systemic balance. In particular, coastal areas at risk of flooding, due to the constant rise in sea levels expected in the next fifty to one hundred years, have been analysed. These are areas that require long-term management, that goes beyond the normal characterisation of urban spaces; specifically, such areas could be defined as changing urban spaces. It is clear that the designs for these areas could not possibly do without a design parameter which is often underestimated: time. Nowadays, this is often introduced in the maintenance phase of the project, only rarely is it considered with the space component during the preliminary project. This leads to a clear predominance of the spatial parameter over the temporal one. Nevertheless, the designer is required to face up to the fact that space changes over time. Therefore, the urban environment needs to be reinterpreted, going from a static system to a dynamic one which changes with time, analogous to a living organism. Thus, a valid methodological response to the cities' geomorphic changes is a time-phased design. Natural phenomena like floods cannot be avoided, they represent objective facts to be faced. For this reason, it is necessary to adopt resilient urban strategies, capable of transforming a traumatic event into a resource in both landscaping and economic terms. First of all, this operation requires an analytical approach which takes into account the city's different systemic components: nature, infrastructure the settlement, and, consequently, the relationships between them. Once the guidelines have been identified, the priority will be towards the geomorphic adaptation of the land, in order to develop the area in a completely safe way, identifying three design time-phases, the current situation, after fifty years and after a century. At this point, it will be possible to adopt targeted planning strategies which will prevent the advance of the water in certain areas, follow the natural course of the floods in others, and integrate the water in the design in others. These measures do not refer to a specific planning phase, but to all of them simultaneously, making it possible to absorb the landscape's natural changes and allowing the city to change in harmony with them.

Keywords: urban natures; urban resilience; time-phases design.

1. INTRODUCTION

In this essay, this research aims to show how a time-phased design, which consider time as an essential design parameter, represent a valuable alternative methodology to apply when the site project is subject to climate change's action that altering its morphology. At this point, it has been hired, as case study, the costal area of Stigsborg Havnefront, in the heart of the Danish city of Aalborg. The area is subject to future floodings, in fifty and hundred years, due to the constant rise in sea levels.

After an initial research and the preliminary analysis carried out at Aalborg University [1], the work has been advanced in Italy at the faculty of Architecture "La Sapienza" in Rome. Here, an urban resilience design strategy has been developed, based on a detailed systemic analysis using the information gathered on site and on further research in the design of public spaces', which led to the formulation of the project.

1.1 Case study

As mentioned in the previous paragraph, the case study is the Danish city of Aalborg, with 200.000 inhabitants and situated in the heart of Northern Jutland. The first settlements date from the XVIII century, when the city developed as a port due to the presence of the fjord. It was only during the Second Industrial Revolution that the city evolved, always maintaining the fjord as the driving force of its urban development. Population growth resulted in a relentless economic and cultural development which continues to this day, to such a point that it has one of the most avant-guard European universities (Figure 1). This social, economic and cultural development could not be conceived without the fjord, which is the lifeblood of the city [3].

It is necessary to point out that global warming and the consequent rapid rise in the average temperature of the planet's surface are causing a relentless rise in sea levels. This has lead the authorities of the city of Aalborg to evaluate the possible effects of this phenomenon on coastal territories, hypothesizing maximum sea level rises of 1m and 1.40 m. According to the fifth assessment report of the IPCC, dated 2014, the most critical estimated scenario (dependant on unforeseen environmental factors) is a sea level rise of 1 m in the next 50 years and of 1.40 m in one hundred years [4]. This raises important issues regarding the planning of urban development along the coastline, which is now vulnerable and needs to ensure the security of its ground through geomorphic adaptation of the land in order to respond resiliently to these continuous changes.

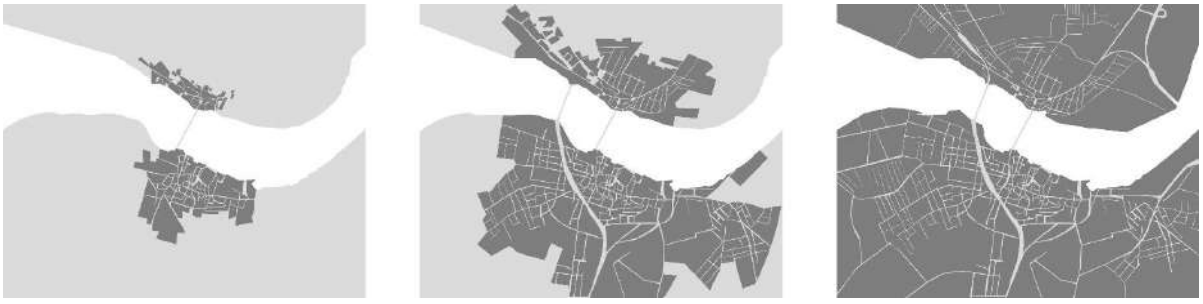

Figure 1. The figures show the urban growth of Aalborg thanks to the fjord. The first one represent the urban extension in 1880, the second one in 1950, the third one in 1993.

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Specifically, the coastal area of Stigsborg Havnefront (Figure 2) has been considered. This area is identified in the strategic urban development plan for the city of Aalborg as a former industrial area to be redeveloped allocating public space for the community, including residential and commercial functions [5].

Should be considered that there is an open discussion about the area, and citizens, experts and people who wants, can participate at the debate bringing their contribution. The public administration consider the participated design as value.

Considering that, the area of Stigsborg Havnefront has been considered such as perfect case study, because of its particular characteristic of being part of an open and public discussion.

Figure 2. Aerial view of the project area "Stigsborg Havnefront".

Surveys and interviews of the people responsible for the future development of the area, regarding the flood risk management measures, revealed that the most advantageous solution, in economic terms and also considering the time factor, is the elevation of street levels in areas likely to be affected by future floods. Therefore, no resilient intervention, just an operation to contrast the force of nature [6].

It is studies regarding the dialogue between architecture and nature [7] and the meaning of urban nature [8], that require a critical reflection on the strategic approach to adopt in these cases. It is therefore considered simplistic, both theoretically and scientifically, to reduce the problem merely to altitude. The adaptation of the built environment to the territorial changes due to climate variation appears to be the challenge for future planning. The most effective response to this can only be the use of an urban resilience strategy, which foresees neither the predominance of built environment over the natural one, nor the contrary, but rather an interpenetration and a peaceful coexistence of the two [9].

This objective of this research is to outline an alternative methodological approach, in order to structure a project which is able to change with time, in harmony with the territory. Time-phase design guarantees the harmonious adaptation of new interventions to climate change.

2. MATERIALS AND METHODS

Mary-Ann Knudstrup's approach, from Aalborg University, for the design of sustainable buildings, called Integrated Design Process (Figure 3), has been used. It is an iterative and holistic process which provides for the collaboration of engineers and architects in order to obtain sustainable architecture which is able to deal with all construction aspects, both aesthetic and strictly functional. This methodology, considering the given differences, has been transposed to landscape architecture adopting an interdisciplinary approach to research and an iterative analysis [10]. The analytic process used in the Integrated Design Process is structured in five phases:

- Problem Phase (Identification of the main problem to which the project has to find an answer)
- Analysis Phase (Analysis of all the components that affect the resolution of the problem)
- Sketching Phase (Possible design solutions for the single components identified during the analysis)
- Synthesis Phase (Systematization of all information obtained)
- Presentation Phase (Presentation of the design solution obtained from the process)

It is important to specify that these phases are not to be considered as subsequent and/or consequent steps, but rather as elements being parts of an iterative process which provides for the revision of previous phases as the project progresses with the acquisition of new elements.

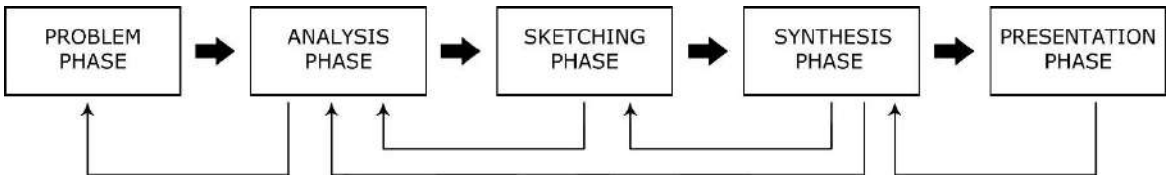

Figure 3. Integrated Design Process.

In addition, the development of a resilient urban strategy is a complex process which, first of all, requires the analysis of the single components that regulate public space: the natural component, the settlement and infrastructure one. Consequently, the single strategies identified for each of the three components, with the addition of the parameter of time, are systemized.

3. RESULTS AND DISCUSSION

The following is the methodological framework applied to the case study.

3.1 Problem Phase

The starting point of the whole process is the identification of the critical problem, the emergency to which the project aims to give an answer. The area of Stigsborg Havnefront is subject to flooding, in the most critical scenario, of about 1 m and 1.40 m in fifty years and one hundred years respectively (Figure 4).

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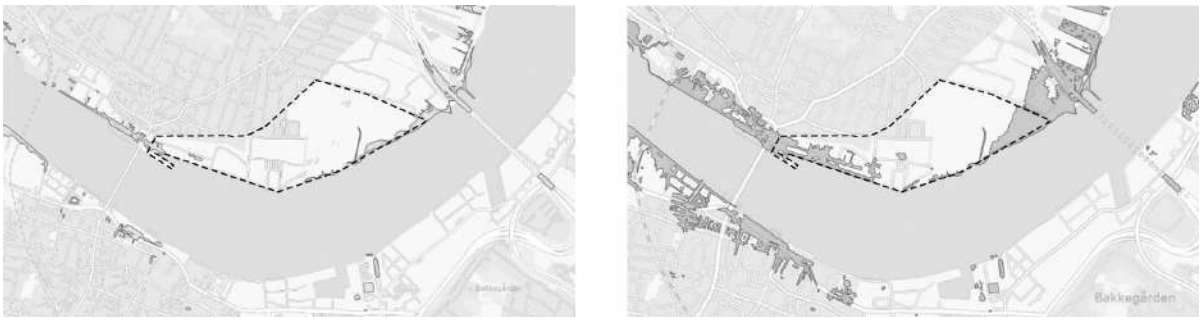

Figure 4. The figures show the effects of the rise in sea levels on the project area; 1 m in the first image and 1,40 m in the second one. Researchers conducted by the public administration of Aalborg city

Considering the fact that some zones of the area are located at an elevation of less than 2 m above sea level, the management of future flooding is the priority objective of the intervention. It is necessary, therefore, to identify how to contain the flooding, albeit in a manner not entirely verifiable, in such a way as to identify which areas are to be protected from the flow and which are allocated to accommodate the water, in such a way that will formally characterize the area.

3.2 Analysis Phase

Once the general problem, to which the project aims to give an answer is established, the next step is the analysis phase, which must constantly be directed to the ultimate aim of the investigation, namely the resolution of the problem identified during the Problem phase. During this phase, the focus is primarily on an in-depth study of the three components considered previously:

a. Environmental and cultural historical values
b. The Urban – morphological aspects
c. Services and infrastructure

What is CRITICAL, what is the POTENTIAL and what are the RESOURCES have been identified for each of these components have been identified in order to develop an environmental strategy, a settlement and an infrastructure. The development of the strategies of the individual components, with the addition of the time parameter has led, as we shall see later, to a single final strategy of urban resilience that synthesizes all the analytical processes leading to the development of a time schedule for the area.

It should be noted, that while respecting the logic of the Integrated Design Process, the phases of analysis and sketching, have been contextual, the reason for which, is that after the explanation of the analysis of each component there will follow a paragraph relating to the phase of sketching which indicates the strategy identified for the component; without prejudice to the iterative nature of the whole process.

3.2. a Component of Environmental and cultural historical values

After a cognitive analysis and assessment of the area, using a scale 1:10,000 it was possible to identify the main critical problem, floods occurring between fifty and a hundred years from now. Potential gains are a large plot of land within the study area, the site of the industrial plant fertilizer "Kemira", recently redeveloped; the resources gained are, the high level environmental landscaping of the area along the panoramic front of Limfjorden (Figure 5).

The sketching phase of the component, and cultural and historical values

The environmental strategy (Figure 8) therefore, involves the creation of a large urban park for the citizens, taking advantage of the large recently redeveloped site of the industrial plant "Kemira" and the redevelopment of the waterfront, of course taking into account the strong interaction this will have with flooding expected between fifty and one hundred years from now.

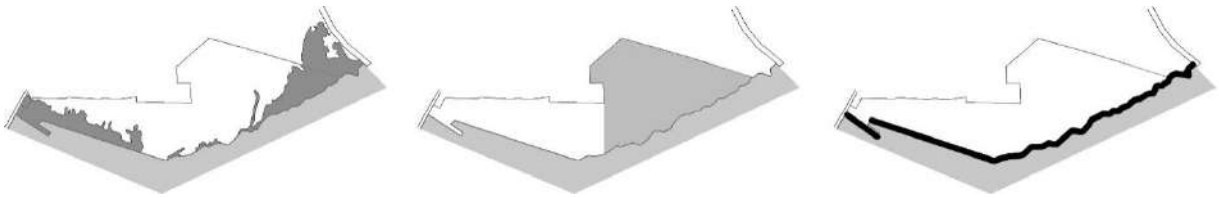

Figure 5. In the following order: critical (floods), potential (large plot of land, recently redeveloped) and resources (panoramic front) Component of Environmental.

3.2. b Component of Settlement - morphological

After a cognitive analysis and assessment of the area, using a scale 1:10,000 it was possible to identify the main critical aspect, the fjord, which is an environmental margin separating two parts of the city with similar functions; Potential, some industrial buildings in the area have great historical value and can be converted to other functions; and Resources achieved, the central location of the project in the context of the consolidated city, which makes it an important strategic site for urban development (Figure 6).

Sketching Phase of the component of the settlement – morphological

The strategy for the settlement (Figure 8), therefore, involves the creation of a new unitary district that includes the entire area of the study, identifying within it different polarities, capable of becoming reference points for new forms of sociability. The presence of industrial relics in the area, will be enhanced by converting them to new use historic buildings, thus maintaining historical perspectives.

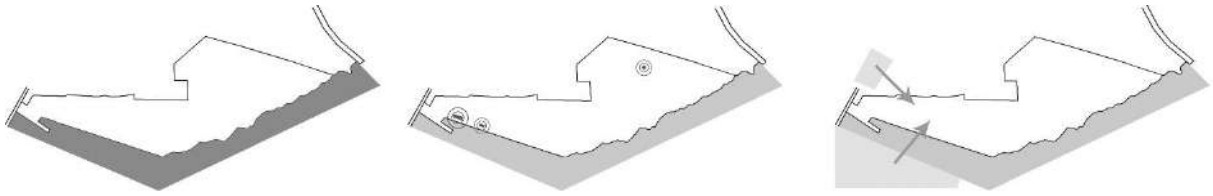

Figure 6. In the following order: critical (fiord as edge), potential (industrial buildings) and resources (the site is close to the city centre). Component of Settlement - morphological

3.2. c Component of the services and infrastructure

After a cognitive analysis and assessment of the area, using a scale 1:10,000 it was possible to identify the main Critical aspect, urban regeneration of the area is now an urban void, with lack of services and infrastructure; Potential, a strategic plan for the realization of a light railway in the vicinity of the area, which could then be put in direct connection with the object of study area; Resources: there are only two vehicular bridges in the city, both in the vicinity of the area, and this makes it an important strategic point (Figure 7).

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Sketching Phase component of the services and infrastructure

The infrastructure strategy (Figure 8) provides for the integration of the existing transport system with new facilities, both within the area and approaches to and from it. It also includes a new ferry, which will connect the project area with the opposite side of the fjord, always taking into account the geomorphological changes that the area will suffer due to the effects of climate change.

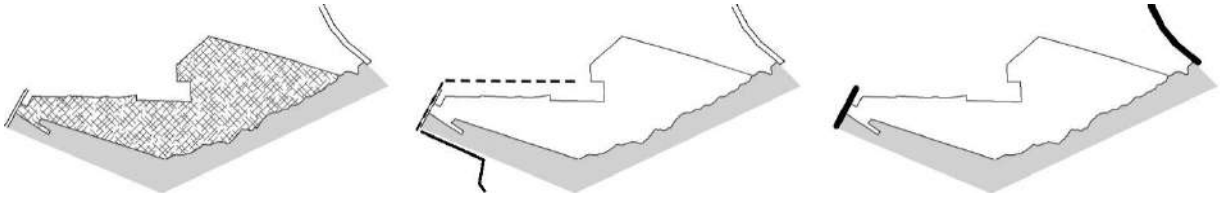

Figure 7. In the following order: critical (urban void), potential (metro light) and resources (two bridges close to the site). Component of the services and infrastructure

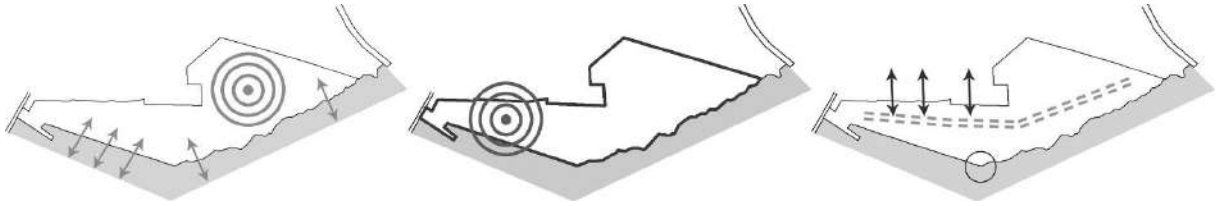

Figure 8. In the following order: environmental strategy, settlement – morphological strategy, services and infrastructure strategy.

3.4 Synthesis Phase: Urban Resilience Strategy

At this stage, taking account of the analyses and always relating to the problem identified at the beginning of the analytic process, the information must be synthesized to get the actual elaboration of the project. The strategies identified in phase Sketching (Environmental Strategy, settlements and infrastructure) have been developed with the addition of the time parameter, to obtain the development of a unified strategy of urban resilience, necessary for the realization of a project for temporal phases, taking into account the actual and real needs identified for the individual components (environmental, morphological and infrastructure). This is crucial to outline the guidelines of a project that guarantees practical habitability for the citizens during all three phases of the project; now and between fifty and a hundred years from now. (Figure 9).

Figure 9. Urban resilience strategy.

From these analyzes, consideration of the geomorphological changes that the territory will undergo between fifty and a hundred years from now as a result of rising sea levels is essential.

It should be specified that the aim of the project is not to delineate a geographical and functional setting of the area for the next fifty to one hundred years, not being able, for example to predict how the population will change, but rather to provide a starting point, a reflection on how to adapt the territory morphologically, how to prepare it to withstand climate changes that will alter its appearance, hypothesizing resilient solutions that characterize the area also from a formal point of view. Starting then from the containing of the planned flooding, it was decided to proceed from a geo-morphological adaptation of the terrain, with interventions differentiated according to the needs of the project, which consider three different approaches which connect the built environment with future flooded areas. The geomorphological modeling interventions are: Countering the rising sea level with a rise in street level in the areas to be protected, such as where there are historic buildings that have been chosen to be protected and converted to new uses; To favour the rise of sea level, allowing water to enter autonomously within the project and change the appearance of the built environment, with the creation of panoramic stairways which directly enter the sea, so as to obtain a panoramic effect that creates a peaceful coexistence between the built and the natural environment; Collecting the water in tanks so as to create new functions, such as public swimming pools, or artificial salt lakes, a way to turn a critical issue into a scenic resource (Figure 10).

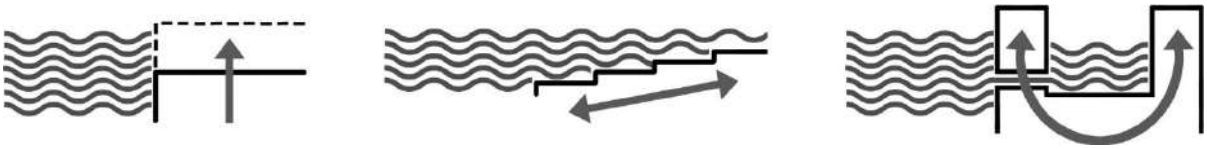

Figure 10. Geo-morphological adaptation of the terrain.

Contextually to this operation of "shaping" morphology, two functional areas have been identified; the first, facing the consolidated city, characterized by a functional mix; the second, where the Kemira industrial plant stood until a few years ago, will be the largest urban park for the city of Aalborg. At this point it was possible to integrate and adapt the infrastructure according to the needs of the project, based on the logical development explained above.

3.5 Presentation Phase

At this stage, on the basis of the synthesis presented above, the design solution resulting from the logical- compositional process can be presented.

At this stage, on the basis of the synthesis presented above, the design solution resulting from the logical- compositional process can be presented.

The following is a design excerpt that shows how the time schedule was handled in a part of the area, in terms of spatial choices, form and function. Specifically, an area of the project is shown where the terrain was modeled in such a way as to create a controlled water collection reservoir, so as to accommodate the sea inside for the next fifty or one hundred years. The picture shows how the change of the functions will be achieved (Figure 11). The area is used as a public garden with offices on stilts in the circumstances that will prevail within fifty and a hundred years, public gardens a scenic walkway on water, a sort of artificial lake that characterizes the urban landscape; an urban landscape in transition. (Figure 12).

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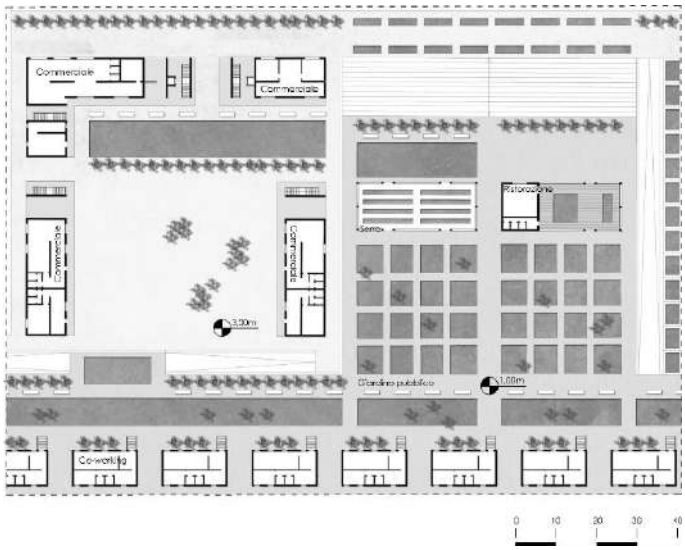

Figure 11. Nowadays. Portion of the project area used as public garden with offices on slits, in order to resist to the entrance of the water in fifty and one - hundred years. Geo-morphological adaptation of the terrain with a water tank.

Figure 12. In fifty and one - hundred years. Portion of the project area used as artificial lake surrounding offices on slits. Walkway in order to reach the offices. Geo-morphological adaptation of the terrain with a water tank.

Below is a view of another project area where the soil was modeled to create a panoramic stairway that goes along the sea permitting the autonomous and natural change of the urban landscape for between fifty and one hundred years (Figurer 13).

Regarding that solution, should be emphasize that panoramic stairways that goes along the sea, are already used for previous waterfront regeneration in Aalborg and that represent a very appreciate design elements, from people, who use them as panoramic squares on the sea.

Thus, this element is both functional, because let the water comes into the project, and give feel of identity, because is referred to formal solution already known in the city.

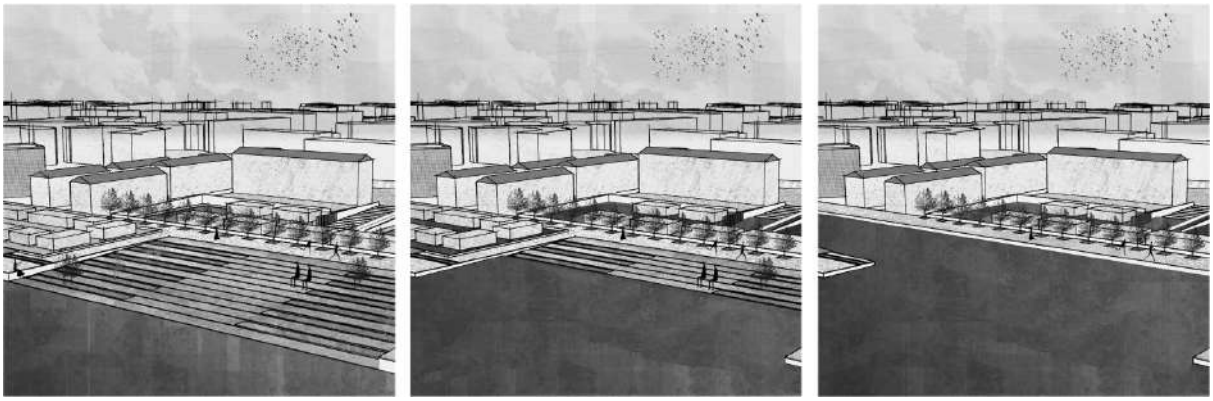

Figure 13. The figure show as following, the same portion of the area nowaday, in fifty and in one – hundred years, thanks to the resilience strategy.

4. CONCLUSIONS

The primary objective of this research was to outline an innovative methodological approach to answer the pressing question of how to handle urban planning in areas subject to changes due to climate change.

This essay, thanks to the case study of Stigsborg Havnefront, presented as example in order to think about new methodology in planning, wants to demonstrate how the method of Integrated Design Process is able to control the inter design process, to reach a resilice strategy.

It is evident that the design approaches in geo-morphologically unstable situations require far-sighted strategies, resilient, demonstrating in the long run, both environmental and economic sustainability. Urban resilience strategies are definitely a goal for spatial planning, and at the same time, require a structured, interdisciplinary methodology for their implementation [12].

Thus, the purpose of this research is about stimulate reflections on the theme of forward – looking strategies, entering time as essential design parameter.

Not only, another theme is about the importance of considering the dialogue between architecture and nature as the only way possible to work on the landscape. It is necessary to understand that the natural and the urban environment must coexist, in order to ensure the right systemic balance.

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