BEYKENT UNIVERSITY

2ND INTERNATIONAL SYMPOSIUM OF

DESIGN FOR LIVING WITH WATER

THE FUTURE IS NOW!

2nd International Symposium of

DESIGN for LIVING with WATER

"from hunting society to society 5.0"

Deadline for Abstract:

October 2, 2020

Deadline for Full Text:

October 30, 2020

A two-day interdisciplinary symposium within the framework of Beykent University and the contributors from six different countries, which aims to discuss and exchange experiences about the past, present and the future roles of water as a design element for living spaces.

THEMES

- Sustainability
- Social factors
- Climate change
- Naval engineering
- Culture and heritage
- Floating architecture
- Futuristic approaches
- Urban transformations

Online Symposium
18-19 November 2020

www.isdlw.org

Beykent University
Faculty of Engineering and Architecture
Interior Architecture Department

Ayazağa Campus Maslak/İstanbul
https://www.beykent.edu.tr/

BEYKENT 2ND INTERNATIONAL SYMPOSIUM OF DESIGN FOR LIVING WITH WATER

18-19 NOVEMBER 2020 ISTANBUL/TURKEY

PROCEEDING BOOK

Edited by
Assoc. Prof. Dr. İnanç Işıl YILDIRIM
Assist. Prof. Dr. Begüm BAYRAKTAROĞLU

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18-19 November 2020 Istanbul/Turkey

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BEYKENT 2ND INTERNATIONAL SYMPOSIUM OF DESIGN

FOR LIVING WITH WATER SCIENTIFIC PROGRAMME

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18 NOVEMBER 2020

Time	Theme
09:30 - 10:00	**Welcome**
10:00 - 11:00	**Begüm BAYRAKTAROĞLU** **"Inspirational and Instructive Processes of Reuse of Old Shipyards While Discussions on the Golden Horn Continue"**
11:00 - 12:00	**Elifcan DUYGUN and İnanç Işıl YILDIRIM** **"An Alternative Design Approach: Floating Spaces of Istanbul"**
	İstem Seckin PARLAKYILDIZ KÖSE, İnanc Işıl YILDIRIM and Selin YILDIZ **"The role of Architecture for the Future of Cruise Ship Tourism in a Post-COVID World: Searching the Roadmap for Cruise Ship Interior Design"**
	Tania FELDZER **"Reinventing the River Seine" and New Innovative Projects around River Boat Design"**
13:00 - 14:00	**N. Yağmur ŞİMŞEK** **"The Role of Water as a Design Element: Effects on Moorish Architecture and It's Cross-Border Structures"**
	Leila Krivosic DIZDAREVIC and Lana KUDUMOVIC **"Water as determinant of Design in Buildings from Ottoman to Contemporary Time in Bosnia"**
	Marwan FARHAN and Heba HUSSEIN **"The Gentrification of Al Haffa Waterfront, Salalah, Oman**
14:00 - 15:00	**Tuba SARI** **"Mobile Houses: New Spatial Searches on Changing Urban Life"**
	Zuhal KOL, Carlos ZARCO SANZ and Meliz AKYOL ALAY **"A Design Proposal for Haliç Coastal Landscape; Employing the Urban Memory to Transform Its Water Ecology"**
	Sayan BHATTACHARYA **"Methods of Arsenic Removal from Contaminated Groundwater with Special**

	Reference to Nanomaterial Application"
15:00 - 16:00	**Işıl BAYSAN SERİM** **"The Cinematic Imaginations of Water Architecture Construct the City of the Future"**
	Muhammad FAWAD NOORİ **"Illumination: Social Responsibility of Designers to safe Water & Environment"**
	Zihni TURKAN and Esra KOKSALDI **"Su ile Yaşam: "Tarihi Kent Dokuları ile Peyzajlarında Sürdürülebilirlik"**
16:00-17:00	**Discussions**
15:30 - 16:30	**Prof. Dr. Şengul OYMEN GUR (Beykent University, Turkey) – Invited Speaker** **"Movies & Omens and Water"**

19 NOVEMBER 2020

Time	Theme
10:30 - 10:45	**Welcome**
10:45 – 11:00	**Chair's Opening speech**
11:00 – 11:15	**Rector's Opening speech**
11:15 – 12:00	**Jacques ROUGERIE (Jacques Rougerie Foundation, France) – Invited Speaker "Living in the Ocean"**
12:00 – 12:45	**Dr. Haris PIPLAS (ETH Zurich, Switzerland) – Invited Speaker "Ecological Urbanism for Port Transformations and Waterscape Management: Integrated Solutions for Future Blue Cities"**
12:45 – 13:30	**Assoc. Prof. Dr. Roberto ROCCO (Delft University of Technology, Netherlands) –Invited Speaker "Beyond the Tragedy of the Commons: The Spatial Justice of Socio-Technical Transitions"**
13:30 – 14:15	**Lunch Break**
14:15 – 15:00	**Associate Prof. Dr. Alma HUDOVIC KLJUNO (International University of Sarajevo, Bosnia and Herzegovina) – Invited Speaker "Importance and Use of Water in Islamic Religious Architecture"**
15:00 – 15:45	**Associate Prof. Dr. Valentina CRISTINI (Polytechnic University of Valencia, Spain) – Invited Speaker "Versus Plus-Heritage for People" Project: First Steps of Conservation Policies in a Selection of Mediterranean Islands"**
15:45 – 16:30	**Dr. Kasim KORKMAZ (Eastern Michigan University, USA) – Invited Speaker "Water Storage, Supply and Delivery Systems in Disaster Management"**
16:30 –17:15	**Associate Prof. Dr. Suk-Kyung KIM (Yonsei University, South Korea) – Invited Speaker "State Park Buildings near to the Lakes in Michigan: Sustainability, Accessibility, and Historic Preservation"**
17:15-17:30	**Final Words**

Beykent 2nd International Symposium Of Design For Living With Water

18-19 November 2019 İstanbul/Turkey

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WELCOME TO ISDLW II 2020

Dear Researchers;

Water is the main life source for human being starting from birth. Throughout the history this vital element effected every field of life as well as the discipline of architecture and design, which have the mission to create comfortable and livable spaces for human. It is observed that apart from alternative living spaces to terrestrial architecture in traditional forms, during the recent years, the studies which include the analysis as to space hotels, floating spaces and effects of spatial characteristics of pole stations on the users have increased. One of the reasons for this, is that people's need for alternative living spaces and resources has come up. The association of the concept of human-space-water is being considered together more frequent day by day.

In Recent years there is a growing focus on living with water due to the extreme climate changes, rising density, economical trends and sustainability problems. Scientist and futurists from all over the world are indicating the solutions for living with water and predict that the relationship between human and water will increase. Not only the countries which have the risk of flood, or rising sea levels, but also the other countries which has the probability of effecting by the climate changes are taking into consideration water based solutions. Also the flow of the capital and changing human life style requirements show us the water as an alternative living space.

Although the concept of living with water seems revolutionary the human relation with water is not a new trend. In the scope of this symposium, different integration types of water to spaces from the vernacular models to floating homes wil be discussed. As a respond to the world's sustainability problems, from both economical, socio - cultural and also the ecological, we need to understand the importance of living with water. As the designers and engineers of the "climate change generation" we have the responsility to look at the past, present and the future and ask the opportunities of water that we could apply, inform and transform to our designs.

We invite designers, architects, engineers, sociologists, students and everyone who feel the need creating solutions sensitive to climate change and for sustainable future of the world on particulary design with water.

Kind Regards…

Assoc. Prof. Dr. İnanç Işıl Yıldırım,
Symposium Chair
Beykent University Faculty of Engineering and Architecture,
Head of Interior Architecture (EN) Department

For more information please visit: www.isdlw.org

"A drop of water,
if it could write out its own history,
would explain the universe to us."
Lucy Larcom

Ladies and gentelmen,

It gives me great pleasure to be making this speech to you this morning as an Organization Chair of 2nd International Symposium of Design for Living with Water.

I would like to tell you the short story of this symposium. While I was submitting my doctorate thesis which named "*Effects of physical elements on spatial cognition of floating spaces: Relation with environment and human behaviour*" in 2012, I recognized that water was everywhere but there were not enough study about living on water. After I finished my PhD, I continued to study on human perception on water. There were lots of researches on water in various disciplines like psychology, engineering, chemistry, etc. but none of them was questioned together human and floating space as an architectural way. So I published my book named "Yacht Interior Design and Perception" which based the post occupancy evaluation of yacht interior spaces as sample of the floating interiors. After all these works with the feeling of a necessity of sharing knowledges and experiences with different disciplines and cultures about living with water, the idea of this symposium came out, as water is a global issue and natural source for all of us.

Now! On behalf of the ISDLW-II orginizing committee, I am honored and delighted to welcome you to the Second Online International Symposium of Design for Living with Water at Beykent University, Within the scope of this symposium, the relationship between water and design will be discussed from hunting societies to Society 5.0. Design solutions that are centering water will be addressed under the themes of sustainability, social factors, climate change, naval engineering, culture and heritage, floating architecture, future approaches and urban transformations. As designers and engineers of the "climate change generation", it is our responsibility to contribute to the design field by looking at the past, present and future through the relationship of water and life.

For the first time in history, the World has been witnessıng the conditions of Covid 19 Pandemic. And the changings at the requirements of this new situation adds new meanings to our lives. We are now using water and water sources more than before, it makes us re evaluate our relation with water and water sources. Although the Living with water is not a new concept but the way we evaluate water needs some considerations and precisions due to the Covid 19.Other from that, extreme climate events are becoming more numerous as the planet's climate transforms as a result of human activity. Not only extreme climate changes but also rising density, economical trends and sustainability problems caused a growing focus on living with water. Scientist and futurists from all over the world are indicating the solutions for living with water and predict that the relationship between human and water will increase. Except from the countries which have the risk of flood, or rising sea levels, the other countries which has the probability of effecting by the climate changes are also taking into consideration water based solutions. Also the flow of the capital and changing human life style requirements show us the water as an alternative living space.

I would like to close this welcome with a round of thanks for everyone who has made ISDLW-II 2020 possible. I would like to start by thanking my fellow members of the Orginizing Committee, in particular Ass. Prof. Dr Begüm Bayraktaroğlu who took many of the

responsibilities associated with the symposium. We are gratefull to our Dean Prof. Mesut KAÇAN for his helpful manner through the process. And special thanks to Beykent University Rector Prof Dr Murat FERMAN for supporting many events associated with the symposium. I want to express my deep regards to our invited speakers for agreeing to take time out of their busy schedules to give us their perspectives on a broad-ranging set of topics. And of course I send my best regards our scientific committe for their time and expertises.

I sincerely hope that you will enjoy the Programme and with my best wishes for a succesful symposium.

Once again, welcome to ISDLW -II!

Assoc Prof Dr İnanç Işıl Yıldırım,

ISDLW General Coordinator

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KEYNOTE SPEAKERS

JACQUES ROUGERIE

Jacques Rougerie is a French world-famous visionary architect, academician, Member of the Institut de France. Passionate about the sea, he has based his work and innovations on biomimicry architecture for more than 30 years.

He is among the most famous architects in the field of marine and littoral habitats, known for his work on equipment respecting their natural environment, deeply inspired by Léonardo da Vinci, a man of both science and art.

Throughout the world, his architecture agency builds scientific and cultural centers and museums of the sea as well as underwater laboratories and habitats, sports and leisure facilities, hotels, industrial equipment and airports. He recently won the competition for the conception of the "International Academician Park" in Qingdao, China.

In 2009, he founded the Jacques Rougerie Foundation housed by the Institut de France. Through its annual “International Architecture Contest” dedicated to the future of the littoral, submarine and space habitats, the Foundation supports visionary, biomimicry architectural projects, encouraging the creativity and passion of young architects, engineers and designers, and helping them turning their projects into realizations.

Assoc. Prof. Dr. SUK-KYUNG KIM

Suk-Kyung Kim is an associate professor in the Department of Interior Architecture and Built Environment at Yonsei University. She had been an Assistant Professor of Interior Design at Michigan State University until August 2019. She was also the Program Director of Interior Design Program at Michigan State She received her PhD in Architecture from Texas A&M University (TAMU), her Master of Science and BS degrees in Housing and Interior Design from Yonsei University in Seoul, Korea. Kim also achieved the Certificate in Health System and Design from the TAMU College of Architecture. Kim’s research topics for funded research and publications include environmental behaviors and perceptions, green and affordable housing for low-income people, occupant satisfaction in green healthcare facilities, supportive design theory and its implications, accessibility and sustainability assessment of Michigan park buildings, and design for the elderly. Currently, she is involved in research projects that aim to improve occupants’ wellbeing in office spaces and students’ health and safety in school environments under the pandemic.

Assoc. Prof. Dr. Roberto ROCCO

Roberto Rocco is Associate Professor of Spatial Planning at the Delft University of Technology, in The Netherlands. With a PhD in Spatial Planning by the same university, he specialises in governance, sustainability and spatial justice. Recent research focuses on understanding socio-technical transitions to sustainability in connection to spatial justice and social sustainability. Roberto works as part of a team for the Union for the Mediterranean (UfM), in charge of drafting an Action Plan for Sustainable Urban Regeneration and Development in the Mediterranean Basin. He has recently edited "The Routledge Handbook on Informal Urbanization" and coordinates research and education for the implementation of the New Urban Agenda.

He is also the coordinator of the Summer School about planning & design with water in TU Delft.

Website: summerschooltudelft.org

Assoc. Prof. Dr. Alma HUDOVIC KLJUNO

Dr. Alma Hudovic Kljuno works as the Associate Professor at the Architecture Program of the International University of Sarajevo (Bosnia and Herzegovina). She mainly teaches design-based courses even though her research interests cover other fields as well, such as history and theory of architecture, social and political impact on architecture and urbanism, gender studies and architecture, etc. She graduated from the University of Technology in Berlin where she also obtained her PhD in 2017. In 2010 she received a grant from the Turkish Government for her PhD research in Turkey.

Professor Hudovic Kljuno is an author of several research papers mostly focusing on contemporary mosque architecture and heritage. She was also invited as a guest lecturer in Berlin, Krakow, Raciborz, Lille, and Sarajevo.

Assoc. Prof. Dr. Valentina CRISTINI

Valentina Cristini (PhD. Architect) is Associate Professor at Faculty of Architecture of Polytechnic University of Valencia (Spain) where she has been working since 2005, starting as granted student researcher. She has been visiting professor in several European and Extra-European Universities and Institutions from the beginning of her career. Currently she teaches both in graduate and postgraduate courses (MSc. Pedagogy). She has extensively published papers and texts on architectural conservation and she has joined several studies, projects and interventions for the preservation of monuments and vernacular architecture as in Spain as abroad. She's also fellow of Res-Arquitectura Group (link), Collaborator of Unesco Chair of Earthen Architecture/ Unitwin/ UPV (link) and she's referee for "Loggia" International Journal Editorial (link) among others.

She actually collaborates with different Agencies and Extra Academic Institutions. She's partner of ANVUR (as external consultant: Agenzia Nazionale Di Valutazione Del Sistema Universitario Della Ricerca, Italy), ACSUG (as external advisor: Axencia para la Calidade do Sistema Universitario de Galicia), European Heritage Volunteers (as collaborator projects: EU-funded NGO), World Monuments Fund (as external reviewer), Institute of Construction Sciences, CSIC, Eduardo Torroja (as external reviewer) and ANEP (as external evaluator: Investigation State Agency).
Experience & Research field: Architectural conservation (principles & practice), surveying historic buildings, heritage education training, study of traditional constructive techniques and raw materials (i.e. brickworks, earth walls, masonries, jack arch floors, lime & gypsum mortars, natural fibers, among others).

Dr. Haris PIPLAS

Dr. Haris Piplas studied in Sarajevo, Berlin, and Milan. He holds a PhD from the Swiss Federal Institute of Technology in Zurich (ETH Zurich), at the Department of Architecture.

Is the author and associate in several urbanistic, landscape and architectural projects in Germany, Denmark, Austria, Eastern Europe, Morocco, Latin America, and other regions. He is also a co-author at Global Urban Toolbox which summarizes spatial and infrastructural challenges under the influence of economic-social, geopolitical and cultural aspects in Case study cities: Berlin, Los Angeles, Zurich, Detroit, Capetown, Beijing, Madrid, etc.

Haris Piplas is the author of the publication of urban transformations in central and Eastern Europe dating 2020. – “City Action Lab: An Integrated Urban Toolkit for Reactivating Cities in Post-Socialist Central Eastern Europe.” He was the editor-in- chief of two editions of the

European Association of Landscape Architects (IFLA) called ”Adaptive Capacity of Cities” and “Political Implications on the Urban Landscape.” He is the initiator of the “Reactivate Sarajevo” Project, and the curator “Sarajevo Now” at the 15th Architectural Biennale in Venice, and also Keynote Speaker at the many international, professional and scientific conferencesİ Such as “We Make The City” Amsterdam, AESOP (Association of European Schools of Planning), ISOCARP (International Society of City and Regional Planners) and “Metropolis non- formal”, Munich, etc. Haris Piplas is also the former Chair Young Leader at Urban Land Institute, nominator Aga Khan Award for Architecture and the Advisory Committee of the European Forum Alpbach, as well as an expert Consultant at the many International Agency at the UN and the EU. Since 2020 he is heading the sector for Urban Design, Planning and Development at Drees&Sommer Switzerland AG department of ‘Integrated Urban Solutions’.

Prof. Dr. Şengül ÖYMEN GÜR

Dr. Öymen Gür, a graduate of the University of Pennsylvania (GSAS-PhD, 1978), received a Fulbright Scholarship (1972-77) and a grant from the DAAD (2002; 2008). She served at KTU (1971-2009). In 1989, she was promoted to a professorship. Currently, she teaches at Beykent University in Istanbul.

She is an active member of CICA, WA, and the Chamber of Architects, and an intermittent member of IAPS, DRS, CIB W84, and IAHS. She is an honorary member of BTI (Bund Türkischer Ingenieure und Akademiker e. V) and SEA (The Sustainable Environment Association). She is the editor of Yakinmimarlik and the International Journal of Architectural Research and Development (Sydney), Mimarlık ve Yaşam (Kocaeli); and the disciplinary editor of Anadolu University and Beykent University Scientific Studies Journals. She also serves as a reviewer of SRE, e-Books, JADE, JAAP MEGARON, A/Z, Gazi, Uludağ, Trakya, Tasarım+Kuram. She is the author and co-author of 28 books and over 400 articles. She mentored over 100 academics. She is married and has two children.

Dr. Kasım A. KORKMAZ

Dr. Korkmaz is currently working as an Associate Professor in Construction Management and Civil Engineering Department at Eastern Michigan University. Dr. Korkmaz has conducted several risk assessment projects throughout the world. He has an extensive research background on natural disaster and risk assessment and modeling. Dr. Korkmaz's core research focuses on constructed facilities and infrastructure from concept through maintenance including disaster planning. He has completed various Michigan Department of Transportation projects related with design, construction and maintenance practices for existing buildings and infrastructures. He has been conducting research on various infrastructure systems such as dams and water reservoir structures. Water storage, supply and delivery systems, irrigation systems, adequate structures and pipelines are in his research area. In his research, he has been in charge of all facets of all of the projects including overall experiment design, designing data collection plans, design and implementation of observational data collection plans, and design and execution of surveys. Currently, he is working on a Transportation Research Board Project. In addition, he is a Co-PI in a Texas Historical Preservation project.

JACQUES ROUGERIE

Je suis extrêmement heureux et honoré d'être ici avec vous

« Comment défendre la nature en partant de la question de l'eau » : c'est justement ce fil conducteur qui a guidé ma vie **d'architecte océanographe**.

J'ai réalisé certains de mes rêves grâce à des rencontres qui m'ont permis de mettre en œuvre ma vision d'une **architecture prospective biomimétique**.

Aujourd'hui, je souhaite la partager avec vous et la transmettre avec passion aux jeunes visionnaires qui imaginent leur futur avec audace. C'est mon engagement et celui de ma Fondation.

Depuis mon plus jeune âge, la mer et l'espace **me fascinent.**

Mais c'est l'océan qui m'a empreint de son chant des vagues pour **mieux donner corps** à mes rêves et à mes passions.

J'ai passé mon enfance sur les plages lointaines d'Afrique, bercé par le vent et la houle du large, **envouté par l'océan**.

Puis, captivé par les préparatifs du commandant Cousteau mettant au point le premier habitat sous-marin au monde : Diogène**…**

Je rêve alors de devenir explorateur et de relever les défis humains sous la mer.

C'est ainsi que je suis devenu avec passion et détermination **un Mérien**, un être du monde sous-marin.

Et puis… **l'exploit de Gagarine dans l'espace !!**

Ces deux aventures, océanique et spatiale m'ouvrent, ainsi qu'au monde entier**, les portes du futur.**

Depuis Cousteau et Gagarine, nous assistons à l'émergence de **deux grandes familles d'explorateurs** façonnant le devenir de l'humanité.

Lorsqu'ils évoluent dans leur milieu extrême respectif, celui de **l'Espace** et celui du **monde sous-marin**, les astronautes et les aquanautes -que j'appelle affectueusement les Mériens- partagent des sensations et des modes de vie similaires.

Mais avant de vous parler de ces mondes et de leurs similitudes, abordons le rôle que **l'eau** et les **rivages marins jouent depuis d**es millénaires dans nos modes de vie**.**

Le destin de l'Humanité est intimement lié à l'eau et à ces rivages marins.

A travers les siècles, les marins ont parcouru les mers du monde. Ils ont participé à l'exploration et à la découverte des civilisations et de notre planète.

Nous savons aussi qu'à travers l'histoire, quasiment **toutes les sociétés** ont construit leur capitale et leurs cités au bord de l'eau, des fleuves, des lacs, des littoraux et même en mer pour des raisons politiques, commerciales, et depuis peu… à des fins **touristiques et sportives.**

Toutes ces cités se distinguent par une identité culturelle et artistique empreinte de leur proximité avec leur milieu aquatique.

Comme par exemple, les peuples de la mer ou de l'eau :

de la cité lacustre de Ganvier au Bénin en Afrique,

des habitats flottants des Uros sur le lac Titicaca au Pérou,

des maisons sur pilotis en pleine mer où vivent près de 10 millions de Badjaos répartis sur les îles des Philippines

Amsterdam, la Venise du nord, avec ses nouveaux quartiers sur l'eau,

ou encore la plus belle des cités sur l'eau : Venise !

Aujourd'hui, notre civilisation est de plus en plus attirée par la mer et son littoral.

Cette frange maritime est l'un des écosystèmes les plus fragiles au monde.

Si l'on observe de l'espace, de nuit, la densité lumineuse des littoraux planétaires, on constate la pression démographique qu'ils subissent.

Au début du 20e siècle, nous étions à peine 2 milliards d'êtres humains, dont 20 % habitaient près des côtes.

Aujourd'hui, nous sommes 7 milliards.

50 % habitent près du littoral.

En 2050 -c'est demain- nous serons près de 10 milliards dont 75% vivront près de la mer.

Nous devons aussi prendre en compte la problématique de la Montée du niveau des océans.

Mais il ne faut pas pour autant tomber dans le catastrophisme.

Avec lucidité, il est urgent de modifier nos comportements en inventant de nouveaux paradigmes pour l'aménagement du littoral et la gestion planétaire de l'eau et des océans.

Notre planète bleue est un véritable vaisseau spatial.

L'océan en est le cœur : il lui fournit les deux tiers de son énergie et de son oxygène.

Comme vous le savez, il recouvre 71% de la surface du globe.

Et pourtant, l'océan demeure encore largement méconnu et fragile.

Il y a seulement un petit siècle que les explorateurs ont entrouvert les portes d'un nouveau monde : le monde sous-marin :

le monde des Mériens.

Ce nouveau monde doit appartenir au bien commun de l'humanité.

Si nous le protégeons l'océan sera un gigantesque champ d'espoir d'où jailliront les énergies renouvelables de demain, la nourriture, la pharmacologie du futur et les biotechnologies nécessaires au développement de la « Blue Economy » et de la « Blue Society ».

Pour bâtir ce futur nous devons impérativement croire au génie humain, à son extraordinaire pouvoir d'adaptation.

Je suis donc convaincu que :

C'est de l'océan et de l'espace que naîtra le destin des civilisations à venir

Pour vivre ma passion de bâtir ce futur sur l'eau, j'ai créé mon atelier au cœur de Paris sur la Seine.

Au centre de ma péniche un bassin de plongée me permet d'écouter de la musique sous l'eau et d'expérimenter les maquettes de mes futurs projets !

Et, comme vous pouvez le voir, il m'arrive parfois de me déplacer en voiture amphibie !

J'ai fondé mes recherches en architecture sur le Biomimétisme que prônait Léonard de Vinci.

Il disait à ses élèves :

Allez prendre vos leçons dans la nature, c'est là qu'est notre futur

Depuis l'origine du monde, la nature dessine les plus belles formes, les courbes les plus élégantes et fabrique les meilleurs matériaux.

Alors je n'ai eu qu'à m'inspirer du génie de Léonard pour créer mes premiers projets, comme cet engin, bio-inspiré par le crabe-araignée.

Ou ici mes premiers dessins de Cités flottantes, fermes marines, musées ou hôtels sous-marins, maisons sous la mer… et aussi de bases ou villages lunaires.

J'ai imaginé ce village sous-marin bio-inspiré par l'araignée argyronète au large des Iles Vierges, par moins 35 m de profondeur. Il est destiné

à une communauté de 250 Mériens, scientifiques, océanographes,

à des programmes de recherche sur les similitudes de vie entre les milieux extrêmes de la Mer et de l'espace et à l'entraînement des Astronautes.

Je suis un rêveur mais un rêveur pragmatique qui va au bout de ses rêves.

Comme avec Galathée, ma première maison-sous-marine, que j'ai non seulement imaginée, dessinée, construite mais aussi expérimentée en 1977.

Galathée a révolutionné les habitats sous-marins de son époque tels que Précontinent, TechTigh, Hydrolab, grâce à son aménagement intérieur spécifique à ce mode de vie en milieu extrême et à son positionnement entre deux eaux qui garantit un impact minimum sur l'environnement

Après Galathée, nous avons dessiné et construit plusieurs maisons sous-marines, dont Hippocampe I et II.

Hippocampe I a été immergée au large de Marseille par 12 mètres de profondeur.

J'y ai séjourné lors d'une expérience menée en 1981 qui s'est terminée par un Noël magique sous la mer: une première mondiale retransmise dans le monde entier.

Nous avions invité 3 enfants plongeurs à nous rejoindre dans l'habitat pour y recevoir leurs cadeaux et partager le repas de Noël au cœur du grand bleu.

Je peux vous dire que plus de trente ans après cela reste le plus beau Noël de leur vie ! Et le mien aussi !

En 1996, nous avons dessiné et expérimenté, Ocean Observer, une maison sous-marine autonome pour deux plongeurs, dérivant dans les courants de l'Océan Indien au large de Sumatra.

Nous avions pour missions l'étude de la biodiversité et la vie en milieu extrême sous la mer sur une longue durée.

Elle fut de courte durée car nous avons malheureusement subi une série de violentes tempêtes successives qui, expédièrent Ocean Observer… à plus de 4 000 mètres de fond.

Inutile de vous dire que ce furent des moments intenses et très très chauds !

N'oublions jamais que c'est la mer qui décide de nos aventures.

En revanche, la mer a été beaucoup plus clémente lors des multiples expériences que nous avons menées avec les Aquabulles.

Nous avons conçu ces abris sous-marins, en forme de méduse, pour accueillir trois plongeurs durant plusieurs heures.

Leur capacité à se positionner à différentes profondeurs facilite l'observation de la faune et la flore ou des recherches d'archéologie sous-marine.

En 2021, nous allons expérimenter une nouvelle Aquabulle dans la baie de Monaco en partenariat avec le Musée Océanographique de Monaco.

J'ai eu l'immense chance de vivre en « Mérien », 12 expériences de séjours dans des habitats sous la mer, 24 Heures sur 24, sur de longues durées.

Vous finissez par vivre en osmose avec la biodiversité du monde sous-marin.

Vous ne pouvez pas imaginer le bonheur d'Habiter la Mer ! Y travailler, se restaurer et développer des créations artistiques procure des sensations uniques spécifiques à ce cadre de vie.

Et puis le plaisir de sortir de son habitat directement dans la troisième dimension de l'univers subaquatique !

Enfin, s'endormir sous la mer et se réveiller entouré d'une faune marine étonnée de découvrir des êtres humains dans un aquarium rempli d'air !

Aujourd'hui, je poursuis ces expériences de vie dans des habitats subaquatiques grâce à Bill Todd, Directeur des programmes SpaceAnalog, Neemo à la NASA.

Ces programmes sont basés sur les similitudes de vie en milieu extrême entre astronautes et aquanautes.

A partir de ces expériences, nous étudions le projet d'une nouvelle génération de maisons sous-marines « SeaSpace » conçue pour 12 plongeurs, par moins 20 mètres de profondeur, au large de la Floride à Key Largo.

J'ai eu l'immense chance de vivre certaines de ces expériences sous la mer avec des astronautes, notamment en 1990 à Key Largo en Floride, dans l'habitat sous-marin La Chalupa.

Comme ici, avec Jean-Loup Chrétien, premier astronaute français et Volodia Titov, premier homme à vivre 1 an dans l'espace et avec, derrière le hublot : Rack Presley et moi-même.

C'est dans ce même habitat, avec Rack que, deux ans plus tard, j'ai participé au record du monde de 69 jours passés sous la mer !

Cette expérience, si forte, a modifié ma perception du monde : je n'ai plus le même regard sur la Mer.

Je n'ai plus qu'une envie, comme les astronautes dans l'espace, y retourner dès que possible !

Comme vous pouvez le voir, j'étais, entre autres, le « French cook » du bord ! Je devais donc relever ce défi supplémentaire : transposer l'Art de la gastronomie dans ce nouveau cadre de vie !

Transposer l'art… Vaste sujet !

L'art et la culture ont toujours accompagné les grandes aventures humaines et l'évolution des civilisations.

Il en sera de même pour l'aventure sous-marine et spatiale car l'océan et l'espace sont des univers de création artistique et culturelle uniques et infinis.

Sous la mer ! Quelle créativité !!

Nous voyons sous l'eau des expressions artistiques toujours plus innovantes !

Des artistes, chorégraphes, musiciens, peintres, sculpteurs… deviennent des artistes Mériens le temps d'une œuvre.

L'Espace, comme la Mer, est une immense source d'inspiration !

Ici, avec ce projet de sculpture pour la lune, cette chorégraphie en apesanteur ou ces ondes électromagnétiques sculptées.

Les astronautes aussi sont souvent des artistes : Le Russe Alexeï Leonov peignant des tableaux aux compositions uniques dans l'espace, Thomas Pesquet jouant du saxophone dans la station spatiale ISS,

Ou la performance à l'orgue de Jean-Loup Chrétien qui a été l'occasion d'une première mondiale : un direct à la télévision entre lui, à bord de la station MIR dans l'Espace et moi sous la Mer, parlant avec lui tout en l'écoutant jouer une musique sidérale !

Cette passion pour l'art dans l'Espace m'a d'ailleurs conduit à imaginer des projets cosmiques dont un diapason spatial pour la Symphonie de la Terre, mais aussi un voilier solaire pour la course de la Terre à la Lune ou encore un village lunaire pour une communauté permanente d'astronautes.

Mais habiter dans l'Espace ou sous la Mer n'est pas encore à la portée de tous.

Alors, comment découvrir le monde sous-marin sans plonger ?

J'ai simplement mis des yeux aux bateaux.

En équipant leurs coques de baies transparentes sous-marines, j'ai donné la possibilité aux scientifiques, aux marins et au amoureux de la mer de voir enfin sous la surface.

Depuis 1979, nous avons construit une vingtaine d'Aquascopes, des semi-submersibles en forme de raie d'une capacité de 10 personnes et des Seascopes, pour 26 personnes voyageant sous la mer.

Puis le Trimaran Aquaspace, avec sa nacelle d'observation sous-marine de 22 mètres entièrement transparente, m'a permis de réaliser un autre de mes rêves les plus chers :

parcourir les Mers de monde avec un regard permanent sous la mer et observer sous l'eau la migration des baleines pendant de longues traversées transatlantiques.

Et j'ai voulu aller encore plus loin !

Ayons l'audace de plonger dans les profondeurs des océans !

Abyssal Explorer, l'explorateur des grands fonds, inspiré par la seiche embarquera 60 chercheurs ou touristes.

Peut-être vous ?

Dans quelques années vous découvrirez les plaines, les dorsales, les failles abyssales ainsi que des épaves mythiques comme le Titanic, par 5000m de profondeur,

Qui sait ?

Mais la synthèse de plus de 30 ans de travaux et d'expériences sous la mer, est SeaOrbiter, un laboratoire permanent au cœur des océans, une plateforme scientifique et éducative unique au monde.

A l'image de la station ISS dans l'espace, ce vaisseau vertical en forme, d'hippocampe, véritable Sentinelle des océans permet à un équipage de vivre sous la mer sur de longues durées avec un regard permanent et inédit sous l'océan.

En imaginant tous ces projets, je reste fidèle à l'esprit de Jules Verne qui disait :

« Tout ce qu'un homme est capable d'imaginer, d'autres hommes seront capables de le réaliser »,

C'est ainsi que j'ai dessiné la Cité des Mériens, une ville flottante, mobile, inspirée par la raie.

Cette cité océanographique internationale de 900m de long et de 500m d'envergure, placée sous l'égide des Nations Unies, accueillera 25 000 personnes, chercheurs étudiants… à la découverte d'un monde encore si peu exploré.

Pour comprendre la nécessité de ces explorations, nous devons sensibiliser et initier un large public aux mystères du monde sous-marin.

C'est dans cet esprit que nous avons réalisé plusieurs grands musées de la mer à travers le monde.

Ils allient les domaines scientifique, éducatif et culturel pour éveiller les consciences aux grands enjeux planétaires des océans.

Les Centres de la Mer Océanopolis à Brest et Nausicaa à Boulogne-sur-Mer que j'ai construits, en sont l'illustration.

Dédiés à la découverte de l'environnement marin, leur mission est de sensibiliser le public à une meilleure gestion de l'océan et de ses ressources.

Actuellement nous construisons à Moorea l'Ecomusée « Fare Natura » dédié à la biodiversité marine de la Polynésie française, à gauche sur la photo.

L'architecture bio-inspirée de ce musée s'appuie aussi sur les traditions polynésiennes que nous avons projetées dans le monde contemporain.

Nous avons d'autres projets de musées de la mer :

L'Océanorium à Kochi,en Inde, est conçu comme une feuille,

A Qingdao en Chine, le Musée de la mer s'inspire du nautile.

Parmi ces Concours internationaux de Musées de la Mer que nous avons remportés avec mon agence d'architecture, le

« Musée d'Archéologie sous la mer »

situé dans la Baie d'Alexandrie en Egypte est placé sous l'égide de l'UNESCO.

Le concept de ce musée conduit les visiteurs en immersion à 6 mètres sous la mer au cœur des vestiges du Palais de Cléopâtre et du port des galères royales englouties.

Laissez-vous emporter par ce film !

Nous travaillons également sur les grands enjeux de l'aménagement littoral, notamment sur deux projets dans les Emirats :

A gauche « City in the Ocean » à Dubaï est un complexe hôtelier avec chambres et restaurants sous la mer.

Il est situé autour d'un lagon semi-artificiel central. Les trois tours jaillissent de la mer, captent l'énergie solaire pour assurer une consommation énergétique optimisée.

Et ici à droite, la Shell Tower d'Abu Dhabi est conçue comme un exosquelette.

Mais le plus emblématique des grands projets d'aménagement et d'architecture sur l'eau que nous avons étudiés, est l'extension de la Principauté de Monaco sur la mer dans le respect des enjeux environnementaux.

Il prévoit des zones de réserves semi-naturelles autour de la construction de deux grandes digues de 1,5 km posées sur des colonnes de 10 m de diamètre sur 80 m de fond captant l'énergie de la houle et des courants.

Ces digues, constituées de récifs artificiels, accueilleront une gare maritime, une université de la mer et des logements. Elles protègeront, au centre, un Opéra de la Mer et une Venise des Temps modernes.

L'un des enjeux majeurs de l'aménagement du littoral est la problématique de la montée du niveau des Océans.

Il y plusieurs façons d'y répondre.

Nous avons imaginé ce projet de Cité flottante d'environ 5000 habitants sur l'atoll de Maupihaa en Polynésie française.

Son concept architectural bio-inspiré, entre autres par la tortue intègre les dernières innovations environnementales.

Afin de minimiser son impact sur la biodiversité du lagon, ces structures sont notamment conçues pour permettre au soleil de pénétrer largement sous la mer.

Notre expertise liée à l'eau nous amène à réaliser de nombreux projets « sur terre » d'équipements sportifs et polyvalents comme Molitor ou la piscine olympique de Vichy.

En Chine, nous réalisons actuellement la Cité internationale des Académies dans la grande ville portuaire de Qingdao. Tel un dragon vert sortant de l'eau, ce bâtiment symbolique et iconique, abritera sur plus d'un kilomètre

un palais des Congrès de 10.000 places et un centre d'affaires,

une vaste galerie d'arts,

un centre d'hébergement étudiants

un complexe sportif,

et une tour de 370m accueillant un hôtel 5 étoiles ainsi que des appartements.

Avant de conclure, je voudrais partager avec vous ceci :

Le langage de l'eau est un langage de tendresse, de caresses qu'aucun mot ne saurait exprimer.

Nous avons accueilli à plusieurs occasions des enfants de 6 à 12 ans, dans un refuge sous-marin entièrement transparent.

Nous leur avons proposé d'écouter de la musique, de dessiner et de déjeuner sous l'eau.

Leurs regards émerveillés se passaient de mots. Ils ont parfaitement ressenti les émotions profondes déclenchées par ce monde mystérieux :

Ils étaient devenus des Mériens !

Cette jeunesse, nous devons l'accompagner. Nous devons donner aux jeunes architectes internationaux qui désirent bâtir ces nouveaux mondes et aux artistes qui les accompagnent, l'élan et les moyens indispensables pour bâtir leurs rêves.

C'est avec cette volonté que j'ai créé en 2009 la Fondation Jacques Rougerie, Génération Espace Mer sous l'égide de l'Institut de France, dont le Président d'honneur est le Prince Albert II de Monaco.

A travers ses Concours internationaux d'Architecture et d'Art, elle souhaite faire naître des vocations, favoriser l'éveil, la sensibilisation et l'action de tous pour la création d'un nouveau rapport entre l'Humain et son environnement.

La Fondation décerne chaque année, les Prix d'architecture de la Mer, de l'Espace et de la Problématique de la montée du niveau des Océans, en partenariat avec l'Unesco.

Elle valorise les projets des lauréats dans des conférences et expositions internationales et dans les médias du monde entier.

Cette année, nous célébrons les 10 ans de ce concours. Depuis sa création, la fondation a reçu près de 10 000 candidatures en provenance de 150 pays.

Les Concours de la Fondation ont permis de créer une banque de plusieurs milliers de projets qui s'enrichit chaque année et constitue une ressource unique pour contribuer à bâtir le monde de demain.

Enfin, les Junior Ambassadeurs de la Fondation présents dans plus de 50 pays contribuent avec une passion et une créativité extraordinaire au rayonnement de la Fondation. Avec spontanéité et audace, ils insufflent leur propre vision qu'ils partagent largement sur les réseaux sociaux de la Fondation.

Je vous propose de découvrir un aperçu de l'imaginaire extraordinaire de ces jeunes créateurs.

Ces projets innovants sont ceux d'une jeune génération qui, avec audace et passion, nous montre le chemin vers ces nouveaux mondes. Elle veut vivre ses rêves.

Alors, laissons-les naître !

Car c'est l'intensité des rêves que l'on réalise qui donne un sens et le goût de la vie.

Je vous remercie.

IMPORTANCE AND USE OF WATER IN ISLAMIC RELIGIOUS ARCHITECTURE

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ABSTRACT

Water is an essential element of life. Its primary function to provide life to every living being is extended to many other spheres of life. In architecture, water is used for many different purposes; as climatic, aesthetic, cultural, or religious element. Particularly in Islamic architecture, water is an inevitable element because of its symbolic dimension (representing spiritual purification). Water features used traditionally in Islamic architecture such as fountains, shallow pools, and water dispensers were used as well as in private gardens of palaces such as Alhambra in Granada or Aali Qapu in Isfahan but also in public spaces, on the squares and streets. They served for drinking, farming, and washing, but were also appreciated due to their formal, decorative, and ritual purpose. Water features related to Islamic religious architecture were mainly used for drinking and ritual washing (ablution). Traditionally, they are most commonly positioned in the courtyards of mosques, but in exceptional cases can be found within the mosque itself or on the outer side of the mosque wall. They have a very special meaning and purpose so a lot of devotion was paid to their design. This paper aims to present the importance and use of water in Islamic religious architecture presented through the design of different water features within and around mosques space supported by traditional and contemporary examples.

Key Words*:* water features, Islamic religious architecture, symbolism, mosques

INTRODUCTION

No living being can live without water. Water is essential to keep us all alive and it is present all around us (in the air, on and below the ground, and in the sky) but it is also contained inside of many living beings. It is a unique chemical element that appears in three different states (liquid, solid, and gas). Another interesting fact about water is that it exists on our planet as fresh and salt water. Salt water is present in the oceans and some saline lakes whereas fresh water can be found underground so it can spring out in the form of rivers and lakes. In total, the Earth coverage with water is almost 71% of which 96.5% is contained within oceans as salt water. As we can see, there is only 3.5% fresh water on Earth that should satisfy the needs of all humans, plants, and land animals. Therefore, we can only conclude that sources of fresh water on our planet are small and very valuable and we should treat them with great respect and use them responsibly.

The architecture was always connected to water. Locations of first human settlements were near water sources. Many ancient civilizations built their empires near rivers or lakes such as a Mesopotamian culture that has bloomed between Euphrates and Tigris or Egyptian civilization that has grown and developed along the river Nile (Hillenbrand, 2007) Humans are in need of water to survive, for their herds, and for farming. Being near water helped humankind to develop. Many engineering inventions were realized that helped humans to transport water away from its source to distant places. Not only entire watering systems were developed with pipes, aqueducts, and water cisterns, but also baths and fountains that were displaying architectural styles of the particular culture.

Water in Islamic culture has a special significance and is therefore often present in its architecture. It was not used only to satisfy basic human needs for drinking, washing, and farming, but very often as an important aesthetic element. Different water features like pools and fountains are present inside the gardens of great palaces and other public buildings. These aesthetic water elements are referring to the symbolic meaning of water in Islam and to the image of gardens in Heaven.

Figure 1. Filippo Baratti, Die Sultanin, 1872 (Hattstein and Delius, 2000)

SYMBOLISM OF WATER IN ISLAM

The word water is mentioned in Quran 63 times. Depending on the context of the chapter which contains the word water, it stands for God's creation of the world, His mercy or warning towards human or a sign of His power (Zargar, 2014).

We made from water every living thing (Quran, 21:30).

Generally, in Islamic culture, water is seen as God's blessing. Images of the afterlife promised to all the true believers and those who perform good deeds depict 'gardens beneath which rivers flow' (2:25). One of the chapters in the Quran is named *Al-Kawthar*, after the water (possibly a river) that will flow in Paradise and will have the ability to purify the drinker. There will be also other water springs such as *Salsabil* and *Tasnim* that will have a similar function (Zargar, 2014).

Another important water source in Islam is the spring of *Zamzam* in Mecca. It is associated with the *hajj*, the pilgrimage, with Hajar and her son Ismail. It is the story of prophet Ibrahim who left his wife and son in a desert to fulfill God's commandment and built the monotheistic temple in Mecca. His wife Hajar and his son Ismail were thirsty so she prayed to God rushing between two hills searching for water. This ritual of walking between two hills (Safa and Marwah) is a part of the pilgrimage and pilgrims drink the water from the *Zamzam* well. It is believed that this water helps to treat the sick and is generally good to drink so it became a popular present from the pilgrimage in Mecca.

The purification with water is not understood only in the physical sense, to wash the body, but also as a spiritual purification which precedes religious rituals. There are two ways of cleansing with water, *ghusl* and *wudu'*. The first one is performed on a dead or a living person and implies washing of the entire body including the head. The second one is a ritual ablution

performed before the prayer or Quran reading. During *wudu'* only certain parts of the body are washed as it is described in the Quran (5:6) (Zargar, 2014).

Since water is so precious and highly appreciated, even in prophet Muhammad's time believers were warned to spend water responsibly and were discouraged to waste it even during the ablution. Additionally, providing water to others (humans, animals, or plants) is considered a good deed and will be rewarded (Jah, 2020).

ELEMENTS OF ISLAMIC RELIGIOUS ARCHITECTURE

Islamic architecture is a general term that embraces different architectural styles that occurred in the countries that were under the rule of the Islamic caliphate starting from the 7th century. Islam as an ideology spread rapidly far beyond the Arabic peninsula. The inherited building traditions from earlier civilizations were the base for further development of the Islamic architecture represented through a variety of secular and religious buildings. Thanks to the cultural diversity of the countries that embraced Islam as a new religion, we cherish the variety of styles in Islamic architecture that are typical for different regions (the Middle East, Iran, India, Indonesia, China, Northern Africa, Spain, Turkey, and Balkans) (Hudović Kljuno, 2017)

"Islamic architecture provides an insight into the beliefs and practices of Muslims throughout history. It adapts and responds to varied cultures and traditional practices upheld by different Islamic generations without interfering with their spirituality." (Ghasemzadeh, Fathebaghali, Tarvirdinassab, 2013, p. 63)

Islamic religious architecture is represented by different types of mosques and *madrasah* (religious schools). In this paper, the focus will be only on mosques due to their representative role in Islamic architecture. The mosque (ar. *masjid*) literally translated is the place of prostration. It is a place (open or closed) used by Muslim believers to perform prayer with other community members. Despite technical and artistic differences depending on the region and period the mosques were built, all of them have five indispensable elements: Qibla wall with mihrab, minbar, minaret, and water feature to perform ablution before prayer. Qibla wall with mihrab gives the direction of prayer. Every mosque is oriented towards Mecca in Saudi Arabia. Minbar is the pulpit, mostly used during the Friday prayer. It is the elevated element from which imam gives his Friday speech. Minarets serve to announce the time of prayer, five times a day. Traditionally, a community member would climb up to the top of the minaret and call for prayer. Nowadays, many mosques have loudspeakers installed on their minarets so that their function in modern time is questionable. And of course, each mosque contains some kind of water feature that is used by believers to perform ablution before prayer.

One of the characteristics of Islamic architecture is definitely decoration. Exteriors and interiors of both, secular and religious buildings, were generously decorated, mostly with calligraphy, geometric, and floral motives. Special attention and care were paid to the design of the five main elements of the mosque. Therefore, many mihrabs, minbars, and minarets are outstanding artistic achievements witnessing the time and culture they were built in.

WATER FEATURES IN ISLAMIC RELIGIOUS ARCHITECTURE

Wudu or ritual washing in Islam which is performed before the prayer or before handling and reading the Quran can be also described as partial ablution. During wudu certain parts of the body are washed: hands, face, ears, neck, wiping the head, washing arms, and feet. Wudu is not only physical cleansing but moreover symbolic cleansing of the mind and soul. During wudu, certain prayers are recited and one should not be engaged in any kind of conversation. The water and the ablution place must be clean and water must not be unnecessarily wasted.

Figure 2. Two water fountains in the courtyard of the Grand Mosque in Aleppo, Syria (Hattstein and Delius, 2000)

Each mosque has some kind of water feature that gives people the opportunity to perform wudu. These water features are also used by visitors or passers-by for drinking and refreshing. Traditionally, the water features were placed outside the mosque, in the courtyard. Usually, those were different kinds of fountains, carefully designed and highly decorated, commonly present in bigger congregation mosques with a central position in the city. Representative examples of courtyard fountains in traditional mosque architecture can be seen all over the world. The Grand Mosque in Aleppo dating from the beginning of the 8th century has two fountains in the middle of its courtyard. As visible in Figure 2, fountains are dating from different periods as it is readable from their form and the shape of the dome. The bigger one has characteristics of the Umayyad architecture whereas the smaller one resembles the fountains from the Ottoman period. The mosques across

Turkey and the Balkan region all have a similar type of fountains in their mosque courtyards recognizable through deep eaves and a tin covered dome (Figure 3 and Figure 4).

Figure 3. Water fountain in the courtyard of the Şehzade mosque (1544-48) in Istanbul, Turkey (Hattstein and Delius, 2000)

Figure 4. Water fountain in the courtyard of the Gazi Husrev-begova mosque (1530) in Sarajevo, Bosnia and Herzegovina (https://commons.wikimedia.org)

Smaller neighborhood mosques built during the Ottoman conquest over the Balkan region, are usually positioned on the corner of two streets with faucets on the outer side of the mosque courtyard wall. In that way, the water feature was used by the entire community for drinking, washing, and also for ablution. This was very important for the residents of those neighborhoods since the water supply system was not developed yet. These water features were also meeting points and places of socialization (Hudović Kljuno, 2017). Such a well-preserved example that is still in use can be seen on the courtyard wall of the Jahja-pašina mosque in Sarajevo, Bosnia and Herzegovina. The mosque is dating from the late 15th and the water feature from the early 16th century (Figure 5).

Figure 5. Water faucet on the outer wall of the Jahja-pašina mosque in Sarajevo, Bosnia and Herzegovina (https://stav.ba)

Another interesting example is Küçuk Efendi or Fevziye mosque in Istanbul, built in the mid-19th century. The mosque is a part of the dervish compound with the baroque elements consistently used in its design. The plan layout is oval and smooth wavy lines are visible in the interior and exterior, as well. The curved outside wall with richly decorated water feature strongly represent Ottoman baroque in Islamic religious architecture (Figure 6).

Figure 6. Water faucet on the outer wall of the Fevziye mosque in Istanbul, Turkey (https://tr.pinterest.com)

A unique example in the allocation of the water feature is the Grand Mosque (Ulu Cami) in Bursa built in the end of the 14th century. The mosque is covered by 20 domes that are arranged in four rows and supported by 12 columns. The water fountain is placed inside of the mosque, in the center of the praying hall. It consists of 18 corners with an open dome above so that light and rain (as one of God's blessings) can enter the mosque (Figure 7).

Figure 7. Water fountain inside the praying hall of the Ulu Cami in Bursa, Turkey (https://www.pinterest.com)

With the technical and infrastructural development of cities, water supply systems were introduced and every newly built structure had access to city water and sewage. This has slightly changed the design of mosques because internal ablution and toilette spaces were added. However, in many contemporary mosque designs, external water fountains centrally positioned in the courtyards remain as a reminder of mosque building tradition and symbolism of water in Islam. Some of the abstract, contemporary designed water fountains are also functioning as landscape elements such as in the case of the Aga Khan awarded Parliament mosque in Ankara from 1990 (Figure 8).

Figure 8. Water fountain in the courtyard of the TBMM mosque in Ankara, Turkey (https://www.reddit.com)

CONCLUSION

Islamic architecture is rich in its diversity thanks to different cultural, ethnic, geographical, and socio-political characteristics of the society in which it occurred. Especially mosques, as the main building typology in Islamic architecture, has experienced many transformations until today. However, the elements of the mosque and its function remained unchanged. An unavoidable element present within every mosque (complex) is water. Water is a blessing from God, many times mentioned in the Quran. Water is the element that will be present in Paradise and such a heavenly image of the afterlife has its presentations in many world-known examples of Islamic architecture. Water is traditionally present in gardens of great palaces and smaller private houses in the form of a pool, fountain, or well. Some kind of water feature

is also an inevitable element in a mosque design moreover because it primarily serves as the ablution place. Water fountains, shallow pools, or faucets, they adorn every mosque courtyard even today when there are separate ablution spaces located inside the mosque. Great attention is paid to the design and decoration of these water features moreover because they are usually centrally positioned. They are important not only due to their primary function to serve as ablution and refreshing places but also because they are reminders of the great building tradition in mosque architecture and generally, on symbolic meaning and importance of water in Islamic culture.

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Assoc. Prof. Dr. Valentina CRISTINI'S PRESENTATION

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2nd INTERNATIONAL DESIGN FOR LIVING WITH WATER SYMPOSIUM (ISDLW-II)

Beykent University, Faculty of Engineering and Architecture, Department of Interior Architecture

18 – 19 November, 2020

Prof. Valentina CRISTINI
(Polytechnic University of Valencia, Spain)

"Versus Plus-Heritage for People" Project:
First Steps of Conservation Policies in a Selection of Mediterranean Islands"

Versus+Heritagefor people_ UPV_ EU Project
leaded by Prof. F. Vegas& Prof. C. Mileto

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UPV ESG UNIFI UNICA CRAterre

COORDINATION AND PARTNERS
UPV – Universitat Politècnica de València, Spain
(Project leader. Main reserchers: Prof. F. Vegas, prof. C. Mileto)
ESG – Escola Superior Gallaecia, Portugal (Partner 2)
UNIFI – Universitá degli Studi di Firenze, Italia (Partner 3)
UNICA - Universitá degli Studi di Cagliari, Italia (Partner 4)
CRATERRE - Association, International Center for Earth Construction, France (Partner 5)

Other universities supporting the project
University of Ljubljana - Faculty of Architecture (Slovenia)
University of Cyprus (Cyprus)
University of Bucarest (Romania)
University of Mons (Belgique)
Oxford Brookes University (United Kingdom)
University of Aarhus (Denmark)

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General Support Entities

ICOMOS-CIAV, International Council of Monuments and Sites
ICOMOS-ISCEAH, International Council of Monuments and Sites – International Scientific Committee of Earthen Architectural Heritage
ICOMOS-ISCARSAH, International Scientific Committee on the Analysis and Restoration of Structures of Architectural Heritage
UNESCO Regional Bureau for Science and Culture in Europe, Venice
UNESCO CHAIR Earthen Architecture, Constructive Cultures and Sustainable Development
REHABIMED
INTBAU INTERNATIONAL
RED PROTERRA, Red Iberoamericana de Arquitectura y Construcción con Tierra (Iberoamerican Net of Earthen Architecture and Construction)
WHITRAP - World Heritage Institute of Training and Research for the Asia and the Pacific Region
ASSOCIAZIONE INTERNAZIONALE CITTÀ DELLA TERRA CRUDA (International Association of Earthen Cities)
MINISTERY OF CULTURE – NATION PLAN FOR TRADITIONAL HERITAGE
GOVERNMENT OF BALEARES ISLANDS - Representant in the National Plan for Traditional Architecture of the government of Baleares Islands
CONSEJO SUPERIOR DE LOS COLEGIOS DE ARQUITECTOS DE ESPAÑA
IVE - Instituto Valenciano de la Edificación

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PREVIOUS EXPERIENCE

https://esg.pt/versus/

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PREVIOUS EXPERIENCE

VerSus: Lessons from Vernacular Heritage for Sustainable Architecture, a European research project developed by ESG/ Escola Superior Gallaecia, Portugal, as Project leader;

It counts with the partnership of UPV/ Universitat Politècnica de València, Spain; UNICA/ Università degli Studi di Cagliari, Italy; UNIFI/ Università degli Studi di Firenze, Italy; and CRAterre-ENSAG/ International Centre for Earthen Architecture at Grenoble National Higher Educational School of Architecture, France.

The project also received the support of the Chair UNESCO-Earthen Architecture, Building Cultures & Sustainable Development, ICOMOS-ISCEAH and ICOMOS-CIAV and the co-funding of the European Union.

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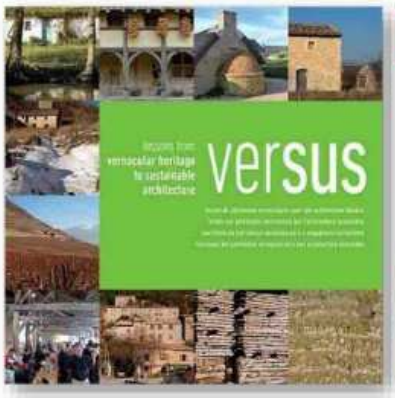
PREVIOUS EXPERIENCE



https://esg.pt/versus/

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AIMS OF THE NEW PROJECT

3 GENERAL AIMS
-To promote, strengthen and expand international and transcultural relations
-To apply knowledge from the fundamental lessons and principles of vernacular heritage
-To disseminate the principles, techniques, and solutions of vernacular heritage in European society

Specific aims and main axes
-To create a multidisciplinary study methodology
-To develop didactic creative activities
-To strengthen the role of local artists, craftsmen and companies
-To promote the study methodology, action strategies, activities developed and project results

FOUR WORK AXES
1. Vernacular heritage contribution to sustainable architecture
2. Materials and art
3. Local craftsmen and traditional construction knowledge
4. Innovative communication and dissemination strategies for improving audiences

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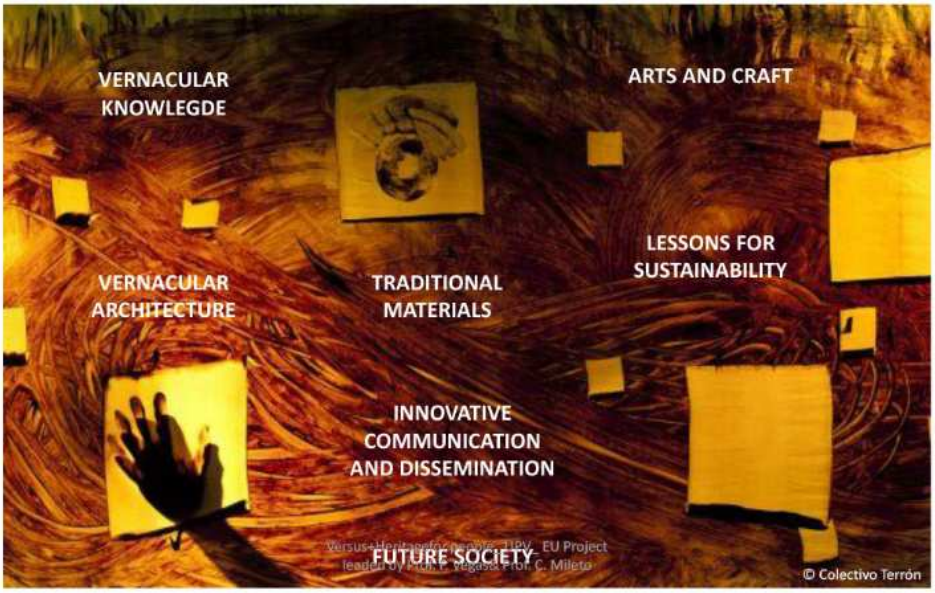

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ACTIVITIES

a. **Scientific activities:** meetings, seminars and international conference

b. **Fieldwork:** data collection, studies and surveys, interviews, videos, etc.

c. **Social participation activities:** meetings with different agents involved in the administration, management, maintenance and enjoyment of vernacular cultural heritage (cultural and social associations, local and regional administrators and managers, professional colleges, craftsmen associations and companies).

d. **Educational and awareness activities:** technical-creative workshops run by craftsmen and local artists for primary and secondary school students and the general public; didactic workshops for children, young people and the general public on the principles and lessons from vernacular heritage and their application in the conservation and future architecture, talks and conferences delivered during the local festivals.

e. **Promotion activities:** showrooms for craftsmen and traditional constructive materials and techniques; showrooms for innovation companies and construction with traditional materials and techniques

f. **Dissemination activities:** website; social networks; YouTube channel; final results book, didactic booklet; mobile app; didactic exhibition

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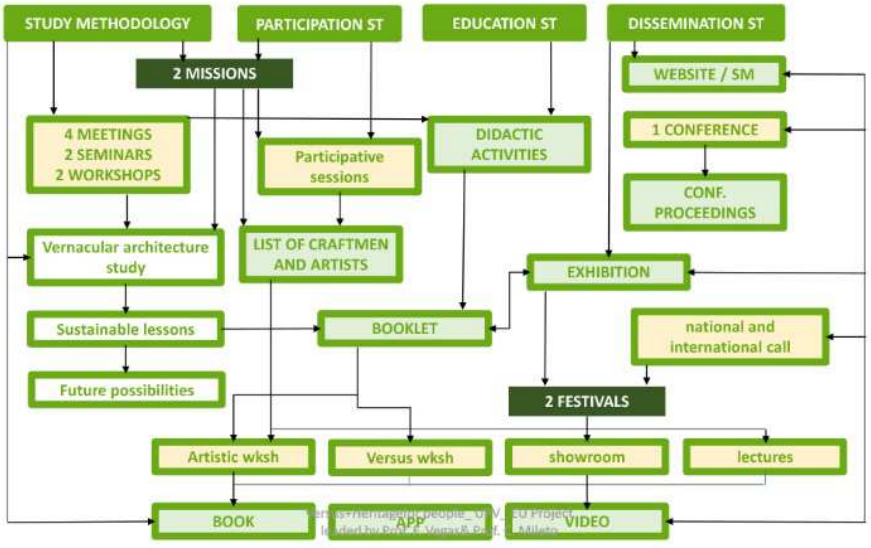

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TARGET AUDIENCE

General public	participative sessions, festivals
Children	festivals
Young people	social networks, festivals
Migrants and refugees	festivals
Local, regional and national administrations	participative sessions, festivals
Specialists and experts in the field of architecture	conference, lectures, articles
Craftsmen and companies from the construction and tourism sectors	participative sessions, festivals
Artists (local, national, international)	participative sessions, festivals

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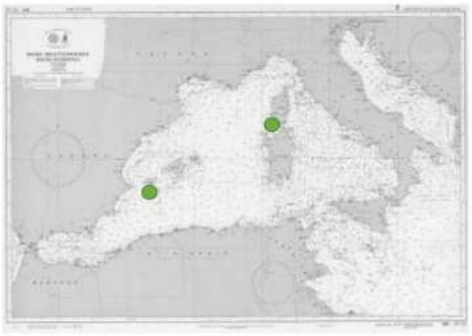
FIELD MISSIONS

CASE STUDIES SELECTION

Selection criteria:
-small or medium islands within EU territory
-Mediterranean islands
-islands that are inhabited year round
-presence of residential and industrial vernacular buildings
-presence of tourism



FORMENTERA and archipelago of the **Balearic Islands**, Spain
Surface: 83.24 km²
Population: 12.124 (2016)

SANT'ANTIOCO and rest of the islands of the archipelago of **Sulcis**, Italy
Surface: 87 km²
Population: 11.811

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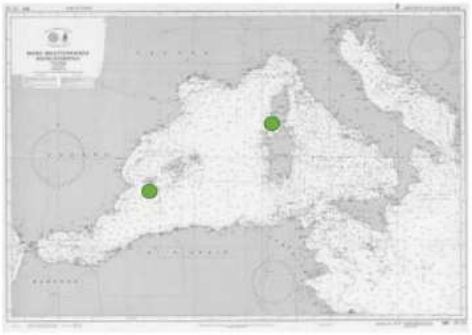

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PREVIUS EXPERIENCES
IN SANT'ANTIOCO AND
FORMENTERA

https://www.terracruda.org/

http://www.culturaydeporte.gob.es/planes-nacionales/dam/jcr:d0da7170-21e2-4125-a1c8-b1f382d5eb5c/2016-plan-gestion-formentera.pdf

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SOCIAL PARTICIPATION ACTIVITIES:

Formentera and Sant'Antioco Partecipative Sessions

- local and regional administrators and managers
- cultural and social local associations
- professional colleges
- local artisans and artists
- craftsmen associations and companies
- teachers
- tourism menagers
- ...

Possible topics for discussion:

-knowledge of local vernacular architecture
-valuation of vernacular architecture
-actions already carried out on the island
-possibilities for vernacular architecture
-difficulties
-relationship of tourism with vernacular architecture
-local management of vernacular architecture
-presence of local artisans and their situation
-possible collaboration with artists
...

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FESTIVALS

A. Educational and awareness activities:

1. **Technical-creative workshops run by craftsmen and local artists** for primary and secondary school students and the general public

2. **Didactic workshops for children, young people and the general public** on the principles and lessons from vernacular heritage and their application in the conservation and future architecture

3. **Talks and conferences** delivered during the local festivals

B. Promotion activities:

4. **showrooms for craftsmen** and traditional constructive materials and techniques

5. **showrooms for innovation companies** and construction with traditional materials and techniques

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En creacion
Le Bol des Sables
Tierra Efimero
la compañía
espectáculos
talleres
calendario
edición
terrón
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TERRE
DESIGN / HABITAT
BAM
BIENNALE ART & MATIÈRES
7 8 9 OCT 16
ALBI
PROGRAMME
PAULINE SEMON
MARTIN POINTET
LEO BOULICOT


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En creacion
Le Roi des Sables
Tierra Efimero
la compañía
espectáculos
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TERRE
DESIGN / HABITAT
BAM
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ALBI
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1. TECHNICAL-CREATIVE WORKSHOPS run by craftsmen and local artists for primary and secondary school students and the general public

PREVIUS WORK
-local call Formentera – UPV
-local call Sant'Antioco – UNICA
-international call – UNICA-UPV- all partners – UE

-workshop design – CRATERRE / UPV / UNICA / UNIFI
-workshop coordination Formentera – UPV
-workshop coordination Sant'Antioco – UNICA
-workshop realization – artist and craftsmen (with all partners)

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2. didactic workshops for children, young people and the general public on the PRINCIPLES AND LESSONS FROM VERNACULAR HERITAGE and their application in the conservation and future architecture

ADAPTATION TO CHILDREN /YOUNG PEOPLE /GENERAL PUBLIC

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ÉLÉMENTERRE
MALLETTE PÉDAGOGIQUE
amàco
ATELIER MATIÈRES À CONSTRUIRE
ABONNEZ-VOUS !
2012-2019
Diseño, desarrollo y puesta en marcha de la maleta educativa de apoyo a la arquitectura tradicional
TAP-TAP
Montada


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METHODOLOGY: details
http://reusingposidonia.com/

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PRELIMINARY AND GENERAL ACTIVITIES

Study methodology – UPV / all partners
-objectives
-field work during missions: graphic documentation, potos, videos, interviews, partecipative sessions, questionnaires...
-data elaboration

Dissemination strategies – ESG-UNIFI / all partners
-Objectives and target definition
-Project image (color, logo, website...)
-Tools (social networks, social media, video, app, book, exibition...)

Participation strategies – UNICA / all partners
-objectives and target definition
-partecipation session organization
-questionnaires

Education strategies – CRATERRE / all partners
-objectives and target definition
-educational activities design / booklet
-educational sesión design

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ACTUAL WORK IN PROGRESS:

STEP 1_ Creation of stakeholders DATA BASE
STEP 2_ Analysis of "melting pot" DYNAMICS

Compiling existing information (bibliography, official documents, webpages...)
Establishing previous contact with:

LOCAL AND REGIONAL ADMINISTRATION
LOCAL ASSOCIATIONS
SCHOOLS
CRAFTMEN
BUILDING ENTERPRISES
ARTISTS
ACCADEMIC CONTRIBUTIONS

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STEP1-DATA BASE

STAKEHOLDERS AND THEIR PROFILES

Name:
Responsable / K-contacts:
Direction:
E-mail:
Web:
Phone Number:
Active since:
Selection of pics/ works:

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Stakeholders:

- Academies
- Administrations
- Associations
- Freelancers
- Cooperatives
- Schools
- SMEs
- Foundations
- Groups/ Collectives
- NGOs
- .....

PIMEEF
PETITA I MITJANA EMPRESA D'EIVISSA I FORMENTERA

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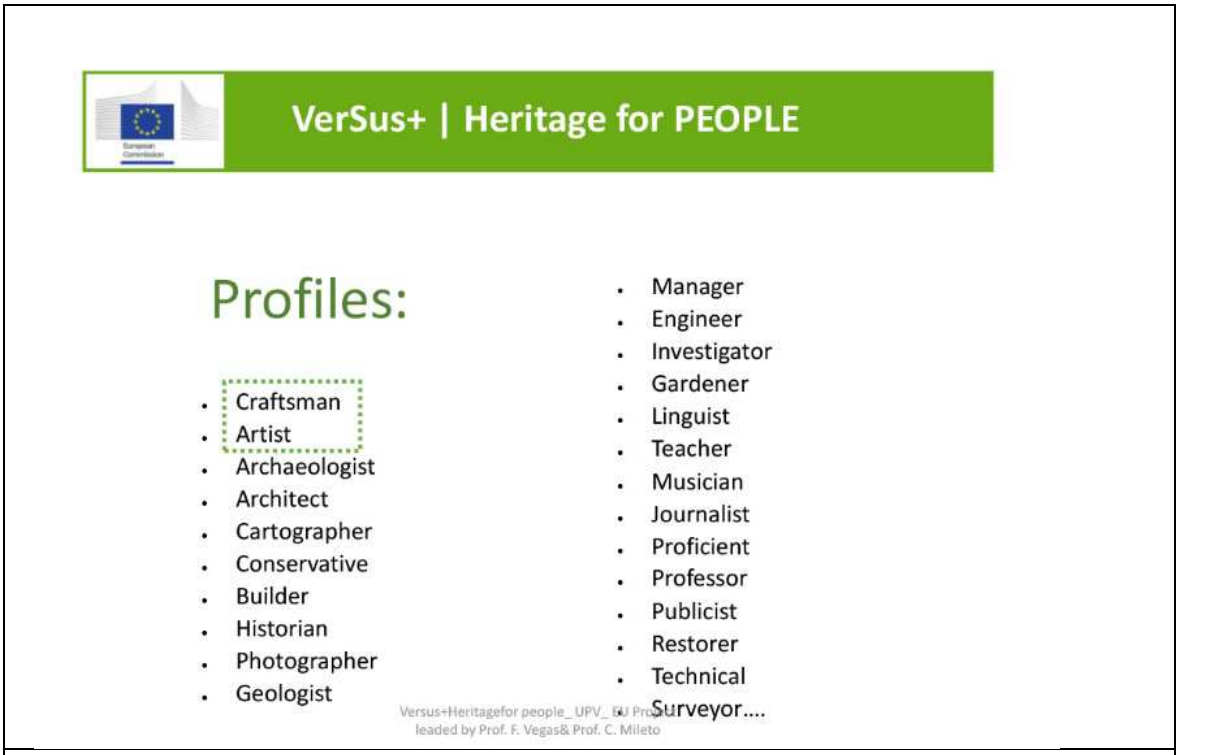
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Profiles:
Craftsman
Artist
Archaeologist
Architect
Cartographer
Conservative
Builder
Historian
Photographer
Geologist
Manager
Engineer
Investigator
Gardener
Linguist
Teacher
Musician
Journalist
Proficient
Professor
Publicist
Restorer
Technical
Surveyor....
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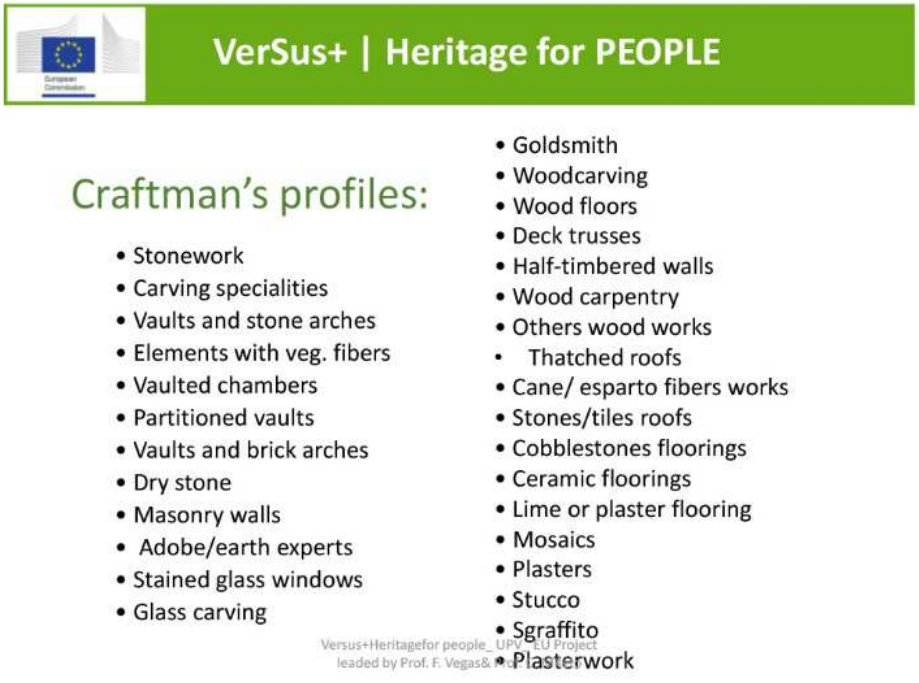
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Craftman's profiles:
Stonework
Carving specialities
Vaults and stone arches
Elements with veg. fibers
Vaulted chambers
Partitioned vaults
Vaults and brick arches
Dry stone
Masonry walls
Adobe/earth experts
Stained glass windows
Glass carving
Goldsmith
Woodcarving
Wood floors
Deck trusses
Half-timbered walls
Wood carpentry
Others wood works
Thatched roofs
Cane/ esparto fibers works
Stones/tiles roofs
Cobblestones floorings
Ceramic floorings
Lime or plaster flooring
Mosaics
Plasters
Stucco
Sgraffito
Plasterwork
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Artist's profiles:

- Body Art
- Digital art
- Ephemeral art
- Performing Art
- Applied Art
- Singing
- Poster design
- Ceramic
- Cinematography
- Comic
- Chorioplasty
- Dance
- Drama
- Drawing
- Cabinetmaking
- Sculpture
- Forge
- Installations
- Gardening
- Jewelry
- Mosaic
- Symphonic Music
- Narrative
- Opera
- Painting
- Poetry
- Upholstery
- Theater
- Typography
- Video Art
- Glass art

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EXAMPLES:

Red Nacional de Maestros de la Construcción Tradicional
https://redmaestros.com/

http://reusingposidonia.com/informe-layman-y-after-life/

https://m-ar.net/

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http://www.culturaydeporte.gob.es/planes-nacionales/planes-nacionales/arquitectura-tradicional/actuaciones/materiales-tradicionales.html


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https://canpasqualrestaurant.com/
https://m-ar.net/
http://www.pedrojhormigo.com/
https://formentera-guitars.com/es/


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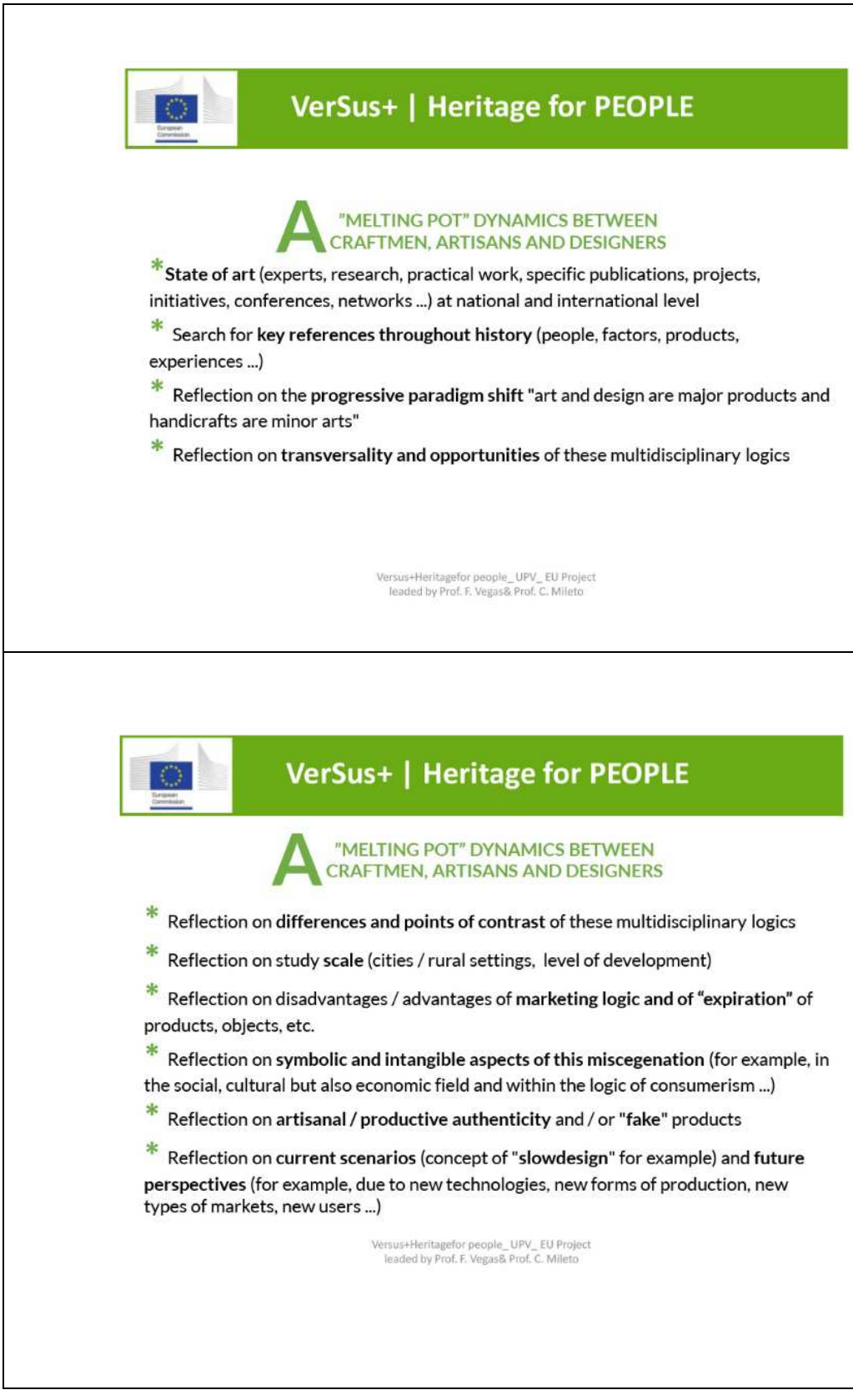
STEP 2
ANALYSIS OF "MELTING POT" DYNAMICS
A - CRAFTMEN, ARTISANS AND DESIGNERS
B - INHABITANTS, TOURISTS, LOCAL AND IMPORTED EXPERIENCES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A "MELTING POT" DYNAMICS BETWEEN CRAFTMEN, ARTISANS AND DESIGNERS
* State of art (experts, research, practical work, specific publications, projects, initiatives, conferences, networks ...) at national and international level
* Search for key references throughout history (people, factors, products, experiences ...)
* Reflection on the progressive paradigm shift "art and design are major products and handicrafts are minor arts"
* Reflection on transversality and opportunities of these multidisciplinary logics
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leaded by Prof. F. Vegas& Prof. C. Mileto
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A "MELTING POT" DYNAMICS BETWEEN CRAFTMEN, ARTISANS AND DESIGNERS
* Reflection on differences and points of contrast of these multidisciplinary logics
* Reflection on study scale (cities / rural settings, level of development)
* Reflection on disadvantages / advantages of marketing logic and of "expiration" of products, objects, etc.
* Reflection on symbolic and intangible aspects of this miscegenation (for example, in the social, cultural but also economic field and within the logic of consumerism ...)
* Reflection on artisanal / productive authenticity and / or "fake" products
* Reflection on current scenarios (concept of "slowdesign" for example) and future perspectives (for example, due to new technologies, new forms of production, new types of markets, new users ...)
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B "MELTING POT" DYNAMICS BETWEEN INHABITANTS, TOURISTS, LOCAL AND IMPORTED EXPERIENCES

* **State of the art** (experts, research, practical work, specific publications, projects, initiatives, conferences, networks ...) at national and international level
* Reflection on the **points of contact** between the local and the imported (who visits? Who lives? What dynamics and logic are there?)
* Reflection on the **concept of "island" itself** (dealing with agents, enclaves, experiences ...) something that is defined as a naturally protected, isolated, closed, rural system ...
* Reflection on the **"internal" and the "external" features** related to an island, whether tangible or intangible ones

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B "MELTING POT" DYNAMICS BETWEEN INHABITANTS, TOURISTS, LOCAL AND IMPORTED EXPERIENCES

* Reflection on **points of contrast between what is local and what is imported** (who visits? Who lives? What are the dynamics and logics?)
* Reflection on the **role of administrations** in promoting respectful dynamics, but at the same time open to tourism (perhaps "the" resource by definition today on the islands)
* Reflection on the **role of architects** (imported and / or contextualized architecture)
* Reflection on the **role of companies** (local/ imported products according the sectors...)

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B "MELTING POT" DYNAMICS BETWEEN INHABITANTS, TOURISTS, LOCAL AND IMPORTED EXPERIENCES

* Reflection on **permeability** (how to make permeable what in itself is "impervious" by definition? Is it possible ?What guided dynamics can be used?)
* Reflection on the **protection and control** mechanisms of the islands (beyond architecture and regulations ... dynamics of access, parking, boarding / disembarking ... visits, stay, costs and tolls ...)
* Reflection on **current scenarios** (concept of "**Glocal**" and protection and control rather than free development and promotion...)

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ACTUAL RESULTS: details


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ripam Intermediate Conference Firenze 2020
Villages and neighborhoods at risk of abandonment.
Knowledge, enhancement and restoration strategies.
ripam
Rencontres internationales du patrimoine architectural méditerranéen
8.5th Intermediate total on line Edition Firenze 25/26 Novembre 2020
Prof. Camilla MILETO, Fernando VEGAS, Valentina CRISTINI, Lidia GARCÍA
(Polytechnic University of Valencia, Spain)
"Traditional spanish architecture "on the edge":
an analysis of benchmarks related to conservation policies"
leaded by Prof. F. Vegas& Prof. C. Mileto


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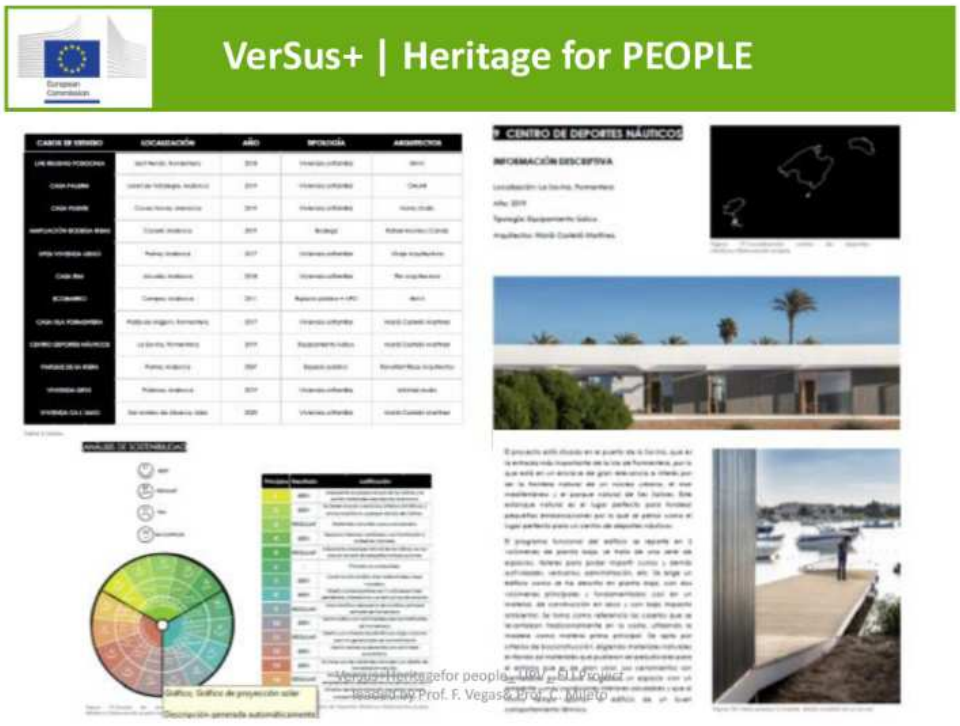
PRÁCTICAS DE
CONSERVACIÓN Y
LECCIONES DE
SOSTENIBILIDAD
CASOS DE ESTUDIO Y ANÁLISIS DE
INTERVENCIONES RECIENTES EN
ISLAS BALEARES
OBJETIVOS DE DESARROLLO SOSTENIBLE
AUTHOR: Alvaro VILLANUEVA PRENDES (Final degree Project)
TUTOR: Valentina CRISTINI
(Polytechnic University of Valencia, Spain)
"Traditional spanish architecture "on the edge":
an analysis of benchmarks related to conservation policies"


VerSus+ | Heritage for PEOPLE
7 CENTRO DE DEPORTES NÁUTICOS
INFORMACIÓN DESCRIPTIVA
Versus+Heritagefor people_ UPV_ EU Project
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2
4
8
CONCLUSIONES
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INSPIRATIONAL AND INSTRUCTIVE PROCESSES OF REUSE OF OLD SHIPYARDS WHILE DISCUSSIONS ON THE GOLDEN HORN CONTINUE

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ABSTRACT

Shipyards are one of the vital city components for water cities. In addition to being the flagship of the cities from the economic aspects, they are the backbone of transportation in water cities. They also have the leading roles in the formation of the built environment and socio-cultural texture in their region and the city.

In line with the technological developments and urbanization principles of the new age, the production methods and areas have changed. Today, shipyards have also been affected by the dynamics of change in industry and urban relations. Thus we encounter them with adaptive reuse projects frequently.

İstanbul is the homeland of Haliç Shipyards which is one of the oldest shipyards in the world with the foundation date 1455. Discussions about the closure of the shipyard and its use with new functions have been on the agenda for a long time in Turkey.

This study aims to contribute to these discussions about the Haliç Shipyards by providing a process-oriented perspective about the reuse projects of old shipyards. First of all the discussions on Haliç are revealed and disputs have been determined. Secondly, Boston Naval Shipyard and Matton Shipyard are analyzed through literature review and reports about the projects. Examples are selected for their inspirational and instructive features in their transformation processes. As a result suggestions for Haliç Shipyard reuse process are presented. As an old cultural heritage which supports the uniqueness of İstanbul, Haliç Shipyards deserves participation oriented approaches, interdisciplinary work and transparent process management.

Key Words*:* Haliç Shipyards, adaptive reuse, shipyard reuse, cultural heritage

INTRODUCTION

Shipyards, as heartlands of water cities, have undertaken many functions throughout the history of these cities. They have been important production centers of cities, sometimes producing warships or different types of ships for freight transportation, and sometimes as steamship construction areas for the transportation of the city. Shipyards are also one of the main economic constituents of the region and the city in which they are located with the employment they provide and the sub-industry they create. In addition to the residences and buildings belonging to the social life of the shipyard employees, they shape the environment of the shipyard area with the sub-industry structures formed around them. Moreover, by being located on the edge of the water, they become a part of the city's or regions silhouette.

There have been considerable changes in production methods and urban design strategies by the end of industrial age. As the pioneer production sites of water cities, shipyards had their share of these changes and were adapted according to the requirements of the new age. The fact that old shipyards are often located at strategic points of water cities has been one of the most important factors that determine how these areas will be shaped in line with the changing urban design strategies. While some shipyards, developing their technologies and production methods, continued their functions as updated production areas by catching up with the age, some of them took on new tasks in the city with new functions or were demolished.

The new existential situations of the reused shipyards in the city with new functions and how to use the "new empty land" in the demolished shipyard areas have been the focus of urban design strategies and thus related disciplines. Although the economical, ecological and socio-cultural dimensions of the topic require interdisciplinary work covering all stakeholders in decision making, sometimes the rent-oriented approach of decision-makers holding the authority leads up to discussions and objections. Haliç Shipyards, one of the oldest shipyards in the world with the foundation date 1455, was brought to the agenda with similar debates with the announcemenet that the Camialtı-Taşkızak Shipyards parts of the Haliç Shipyards will be tendered under the name of Haliçport (Istanbul Haliç Yacht Harbor and Complex Project) with a build-operate-transfer model, in the official newspaper dated 13.05.2013. (Resmi Gazete, 2013)

In this study, the debates on Haliç Shipyards are revealed and then some suggestions have been developed about the renewal processes of Haliç Shipyards through the analyzes of two shipyard reuse projects.

HALİÇ SHIPYARDS DEBATES

Istanbul Shipyards, built as a few niches by Fatih Sultan Mehmet in 1455 after the conquest of Istanbul, were expanded from Galata to Hasköy with the dry docks added in the 18th century and the factories built in the 19th century and maintained its function by dividing into three as Haliç, Camialtı and Taşkızak Shipyards until the early 2000s. (Köksal, 1996) On April 2000, by the decision of High Council for Privatization, Haliç Shipyards were closed, 69.000 m2 Haliç Shipyards was assigned to İstanbul University Institute of Marine Science and Management and 72.000 m2 Camialtı Shipyards was assigned to İstanbul Governorship to be used as police school, however new functions were not implemented. (Köksal, 2001)

Figure 1. Taşkızak and Camialtı shipyards in 1982 and today (İBB, 2020)

After the declaration of Haliçport project on 2013, which was consisting of two yacht ports with 140 yatches capacity totally, two 5-star hotels with 400 rooms each, shops, restaurants, cultural centers, cinema and entertainment facilities, 1000-person mosque and car park, objections became visible. A group named “Haliç Dayanışması” was formed in 2013 just after the declaration of the tender for Haliçport. This group comprises shipyard veterans, trade unions, professional organizations and members, neighborhood residents and associations that have been living together with the shipyard for centuries. (Köksal, 2013) Haliç Dayanışması, which has been closely monitoring the process regarding the Haliç Shipyards since its establishment, is known to the public with its press releases and supports to the struggles against the project.

Haliç Dayanışması hold the view that Haliçport project poses a great threat that will disrupt the Golden Horn landscape, the Haliç Shipyards and will destroy their identity. They expressed their belief that old industrial heritage, the landscape

values of the Golden Horn, the archaeological assets in the shipyard area, the historical buildings and the surrounding urban texture, the public property around can only be protected by the approach of public interest. They also explained their formation purpose as to advocate the accurate assessment of the threatened public heritage and the development of the shipyard's production-employment potential to carry it into the future. (Haliç Dayanışması, 2013)

In 2019, Haliçport was reintroduced as "Tersane İstanbul" and it contained three museums unlike the Haliçport. In June 2020, Beyoğlu Municipality Mayor informed the public about the current status of the project with a press release and stated that the area will be opened for use in 2021. The works within the scope of the tender are ongoing at Taşkızak and Camialtı shipyards. In January 2020 İstanbul Metropolitan Municipality announced the project competiton in Haliç Shipyards. In the first stage, 42 projects passed the pre-selection and were qualified to compete in the final. In the final competition which was concluded in July 2020, the region was divided into 7 areas and 6 teams produced projects for each area. (İBB, 2020)

Figure 2. Haliç shipyards in 1982 and today (İBB, 2020)

In its latest press release dated June 2020, Haliç Dayanışması reminds the public of legal legislation on protected areas, buildings and their integrated equipments and states that all kinds of savings are subject to the permission and approval of the conservation boards. They also call the change of name from Haliçport to Tersane İstanbul as an image refresher work under the name of brand design after the Galataport and Haydarpaşaport projects which have a negative public image. Being against the competition that divides the area into 7 parts, Haliç Dayanışması argues that Haliç Shipyards should be handled with a holistic vision covering all its values. The protection of the shipyard means preserving the pools, sleds, ateliers, cranes, machines, benches and others, as well as preserving all its values such as production, education, logistics, employment and collective memory. (Haliç Dayanışması, 2020)

REUSE OF OLD SHIPYARDS

In order to contribute to the discussions about the Haliç Shipyards, Boston Naval Shipyard and Matton Shipyard are analyzed in terms of decision and transformation processes. The examples that are intended to shed light on the Haliç Shipyards discussions have been chosen for their inspirational and instructive features in terms of process management and publicity.

Boston Naval Shipyard

Established by the Massachusetts Parliament in June 1800, the shipyard operated for 174 years until its closure on 1974. The shipyard, which served as the most important naval facility in the region during both world wars, employed thousands of people and hosted technical innovations, was included in the National Historic Sites List in the mid-1960s. (National Park Service, 2020)

Figure 3. Boston Naval Shipyard (DHF, 2020)

As a result of the initial studies led by BRA (Boston Redevelopment Authority), which is responsible for the revitalization of the area, it was decided that the area is suitable for historical, residential and industrial use, but as a result of 2 years of initiatives, the program has shifted towards mixed use. The shipyard area was divided into 4 regions as Nationl Historic Park, Historic Monument Area, New Development Area, Shipyard Park and some design principles had been determined. National Historic Park and Shipyard Park was opened at the end of 1980. (Gordon, 1999)

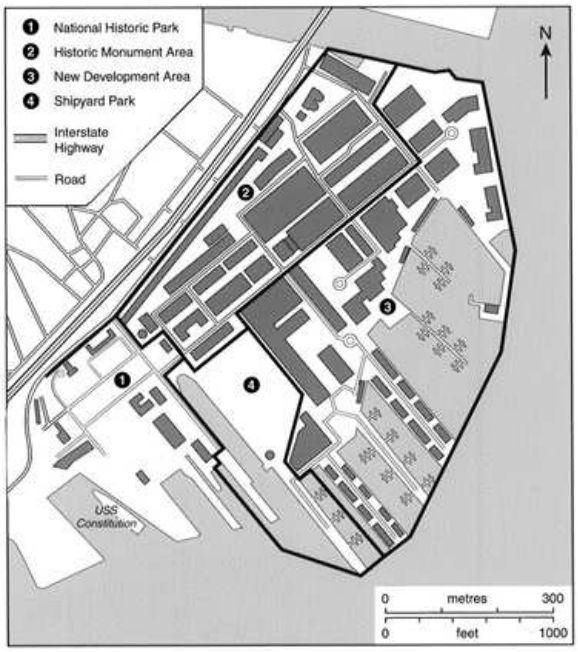

Figure 4. Navy yard site plan (Gordon, 1999)

In 1978, the BRA gave Immobiliare Company all development rights in the New Development Area in exchange for $ 1.76 million required to purchase the land from the federal government. The profit-oriented approach of the Immobiliare company, the shipyard's not being on a main public transportation network, the uncertainties in the national economy, the urban protests that occurred as a result of the BRA's permission to close some coastal areas in Boston to the public, resulted in time and cost increase. A neighborhood council occured from the promises of mayor for political reasons and the design proposals were discussed by this council. BRA prepared a design guideline for the entire New Development Area as a result of the new rules formed in the process. (Gordon, 1999)

The involvement of the National Parks Service and the Interior Department as the shipyard is on the National Historic Sites list, led the BRA to prepare design guidelines for a single approval strategy for reuse of historical assets. Natural rigidity of historical buildings, discussions on the design principles as an obstacle to structural changes, slow approval processes were the reasons that prolonged the planning of the historical area. A large part of the Historic Monument Area was still unused in the late 1990s. (Gordon, 1999)

The instructive lessons from the transformation process of the area can be stated as;

- The importance of the public investment besides private sector in order not to compromise on citizen rights.
- The importance of an efficient and timely decision-making mechanisms in order to prevent time and money loss.
- Public space use, city skyline, social benefit contexts should not left behind from for-profit approaches by the authority holders.

The inspiraitonal key points are;

- The inclusion of factors that encourage participation of local people, such as the neighborhood council, even for political reasons.
- Interdisciplinary working order including expert staff such as National Park Service and Interior Department.
- Design guideline updates according to changing conditions in the process at the risk of wasting time.

Matton Shipyard

The Matton Shipyard operated nearly 70 years since its foundation in 1916 as a civilian-owned shipyard. It is located on Van Schaick Island in the City of Cohoes, New York along the west bank of the Hudson River. (ECNHC, 2018)

Figure 5. Matton Shipyard location and site in 1949 (Google maps, 2020) (ECHNC, 2020)

It was purchased by the New York State Office of Parks, Recreation and Historic Preservation (NYS OPRHP) in 1989 and incorporated into the Peebles Island State Park. After listed on the National Register in 2010, some of the buildings were destroyed by hurricane Irene in 2011 and heavy snowfalls in 2015. The Erie Canalway Heritage Fund (ECHF), which is a non-profit foundation, started to prepare a study in the area with a team of experts in historic preservation, archaeology, hydrology and structural engineering. As an important part of the Erie Canalway National Heritage Corridor, preservation of the remaining industrial heritage, transformation of the area to a cultural and educational center, providing public access to the waterfront and sustainability were determined as the main goals to be achieved. Historical documentation, archaeological investigation, topographic survey, detailed building and infrasturcture analyzes were conducted by literature view, tests and fieldwork. In order to determine the potential flooding problems a hydrology study was also performed. Land uses were reviewed in city scale and specific recommendations to Matton Shipyards were taken into account. (ECNHC, 2018)

By archive scanning method special attention was given to the transfer of past experiences of the employes and operations in the field, thus the societal dimension of the heritage concept was also included in the study. Interviews and workshops were organized including all stakeholders from residents to elected officials and all the information were shared with the community. After the collection of all data and discussions in community, a plan was developed for the area which will be implemented in the short, mid and long term. (ECNHC, 2018)

The instructive lessons from the transformation planning process of the area can be stated as;

- Heritage values, regardless of scale and location, are important and can be an opportunity to improve the environment.
- It is easier to access economic and technical resources for new possibilities in places with good planning practices.
- Detailed technical research is required to make the right decisions for long-term uses.

The inspiraitonal key points are;

- The importance attached to participation including all stakeholders.
- The existence of an overall system formed by subsystems that are interconnected and support each other such as Erie Canalway as a part of New York canal system or land use studies in different scales.
- Special attention given to the spatial memory such as the stories and experiences of employes and local residences.

CONCLUSION

Old shipyards have vital importance for the water cities due to the facts that they;

- usually have a very strategic and valuable location in the city.
- are the part of the city skyline.
- have industrial heritage value as a whole with their buildings, equipments, structures and experiences.
- are the flagships of maritime transportation.
- are the one of the most important components contributing to the urban economy with the employment and sub-industry they provide.
- are the production areas that shape their environment both physically and socially.
- are public domains due to their coastal use and being as part of urban memory.

Old shipyard sites and buildings, therefore, need a well-planned transformation process for long-term use, sustainability, and urban support. The way to achieve this is through a decision-making process that has a detailed technical and theoretical knowledge background, in cooperation with expert staff and accepts everyone related to the field as a stakeholder.

In the analyzed examples, the importance of the support of governmental mechanisms in economy and planning and the transparent management approach which includes participation emerges. Moreover, it turns out that detailed technical preliminary research and working in coordination with experts from different disciplines is a common approach in such areas. As it can be seen from the examples preservation of the cultural assets including the intangible ones provide urban support and participation.

Haliç Shipyard, which is of great importance for the region, city, and world cultural heritage with its many features, deserves a more careful approach than many others. First, the site has great archeological importance due to the historical background of the city and the region. Secondly, it has been an important education center besides its production facilities. Therefore, in addition to being an important document of shipping history and technological development, it is also a particularly important resource where technical knowledge on shipbuilding and maintenance is accumulated and updated. It also has an industrial heritage value with all tangible and intangible assets. It is located in an area that can completely change the physical and social fabric around the oldest part of the city with the interventions to be made.

A decision-making and planning process that prioritizes the issues listed below is vital for the Golden Horn Region, Istanbul and the world industrial heritage.

- in-depth scientific research and analysis to reveal the archaeological features of the area
- detailed scientific research to determine the seismicity of the area
- detailed documentation of all buildings, structures and equipments in the area
- participatory approach covering shipyard workers, residents of the region, experts who have worked on the field, trade associations and all citizens
- a transparent process where all the details are shared with the public
- a constructive dialogue process with all stakeholders
- documentation of the site memory, including the experiences and stories of shipyard employees and residents.

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AN ALTERNATIVE DESIGN APPROACH: FLOATING SPACES OF ISTANBUL

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ABSTRACT

Water has been a vital factor in human life in every period of history. Urban morphology and form of structures have changed as a result of relation with water. Water creates an alternative in building future along with environmental problems. In geographies which have strong relations with water, floating architectural structures are seen. As a result of transformed circumstances, a variety of floating spaces are increasing. Istanbul has a special location at the point where Asian and European continents meet, and its coastal line is remarkable rich. First spatial examples of marine and coastal culture of İstanbul has seen in the late period of Ottoman Empire. After construction of Modern Turkey, summer houses, sea baths, beaches got spread to larger social strata and became a part of İstanbul's daily routine. However, the architectural relationship with water has been still subaltern. Due to demographical, environmental and economic changes of İstanbul after 50s, s got weaken. On the other hand, İstanbul as a metropolitan area is still full of potential with fixed and active population. Despite the indirect and weak marine and coastal culture, there is manufactured examples in reference to floating architecture. In 1940, Architect Ahsen Yapanar and in 1970 Architect Melih Koray and Ergin Gömüç designed floating houses. In spite of those early examples, continuity hasn't been provided. Turkey and especially İstanbul has a huge role in naval architecture in the world, but floating architecture in design is neglected. Istanbul has lost its coastal culture compared to previous years but to revive them, the sea is the considerably current option. This study aimed to focus on coastal culture in the late Ottoman and early Republic era, to examine the relationship of floating places with coastal culture in the context of Yapanar's and Koray's design. It also purposes to open a discussion area on the role that floating spaces can play in order to develop coastal culture.

Key Words: Floating Spaces; Marine Culture; Coastal Culture; Ahsen Yapanar ; Melih Koray

INTRODUCTION

In every period of history, water has a massive influence on human life and the evaluation of culture. From ancient ages to today, also as a topographical element, water affects the cities in the field of geography, technology, transportation, social and cultural life, ecology, and defence. According to the role of water in the cities, urban morphology, culture, and identity shape by different functions that are developed in time (Kılıç, 2001). Water always is the source that supports life on earth. In addition to functional benefits, it offers a proper climate for nature, view, and landscape area (Hamamcıoğlu, 2005).

The cities such as New York, Hong Kong, Rotterdam, Hamburg, or Istanbul are known for their culture of water and its historical background. In these cities, the new daily life practices, leisure culture, specified public spheres, and functions are established in time by the effect of circumstances that related to water directly. In these cities, beyond ports and - the main trade spaces, new centres that have summer resorts, motels, beaches, sea baths, city clubs are seen in the city or suburb. The settlements extended the city and created new habits. In time, some cities could protect this culture but some of them lost their identity under the effect of socio-economic, cultural, and conditions. These are;

- Global Warming
- Climatic Changes
- Rising Sea Levels
- Increasing of Population
- Influx of Population
- Restriction of the Use of Land Areas in the Earth
- Human intervention in coast lines

The current and future facts listed above show us that we need new alternatives for a sustainable and liveable environment, so architecture appears before us by creating new solutions. In this case, architecture and water association can establish new approaches in geographies that have strong cultural, economic, and topographic relations with water such as experiments in the past. The relation of architecture and water collaborates cultural and physical environment at the same time. As a result of these, architectural products have been shaped by this collaboration.

The architecture of the water can be categorized as two groups: Architecture in water and architecture on water. Architecture in water contains semi-submerged and fully submerged structures. The major habitable space of semi-submerged structures is under the water and rest of them are above water (Figure 1).

Figure 1: Semi-submerged house in Dubai (Designboom, 2015)

Fully submerged structures are fully under the water. Both structures have a special mechanism for ventilation, lighting and other services (Figure 2). Architecture on water types are structures with habitable spaces above water and floating architecture. Structures with habitable spaces above water provide life on the water but the supporting foundations submerged in water. Floating architecture consists of various structures afloat on the surface of water (Surana, 2017). Even in previous periods, various examples in different scales had been observed, considering today's conditions and technology, new standards and practices will emerge in the public and private sphere in the future. At the same time, as a result of the changes experienced, the daily life practices and lifestyles of humans will change and new cultural structures will occur.

Figure 2: Europe's first fully submerged restaurant 'Under' (Snohetta, 2019)

Floating architecture offers a flexible and sustainable alternative living space for public and private spaces around the world. Floating structures samples have been seen and built in İstanbul, which has one of the rare topographies on the earth. However, floating architecture examples could not be permanent due to the weakening of the relationship established with water which rose at the end of the 19th century and spread to different strata of the society in early years of the republic. Today, despite the appearance of İstanbul's coastlines, the relationship with the water is established indirectly. This study claims that even though the city has potentials, the indirect relations between users and coasts have weakened the water culture of Istanbul and the samples of floating structures could not evolve. The search for a new design is important in cities such as Istanbul, where the relationship with water is limited by an invisible obstacle despite its rich possibilities. The purpose of the article is to establish the evaluation of sea culture in Istanbul and discuss alternative design approaches revealed. The chief task of the study creates discussion content to attract attention to values and potential of the city. Ergo, the historical process is limited from the early 19th century to today and samples contain only floating architecture samples. The study is structured in five main sections. Section two states that the concept of floating architecture. Section three with two sub-sections establishes the transformation of sea culture in Istanbul, and examines the samples designed by Ahsen Yapanar, Melih Koray and Ergin Gömüç. Section four concludes the past and current findings, pointing future approaches and calling for new discussions.

CONCEPT of FLOATING ARCHITECTURE

Floating architecture or living/working on the water is an increasingly recognizable approach today. Floating spaces define a structure that floats on water via a floatation system, is moored in a permanent location. They can contain a navigation system or not. In addition to this, they can have premises services or have self-supporting service facilities that provide electricity, water/sewage, gas itself (Moon,2014). Whether the contemporary forms of floating space samples are observed today, the structures are not brand-new technology and the origin of them dates back. Asian has a much longer history of floating architecture than European examples. Early forms of floating architecture are seen in Europe as houseboats (Stopp & Strangfeld, 2010). Early samples of houseboats were used in the 17th century and after two world wars, in the 20th century, the number of houseboats had already reached 10,000 (Figure 3). The transformed living places are accepted as pioneers on the water (Kloos & De Korte, 2007). Notwithstanding, houseboats are designed as boats instead of housing and used for living, whereas floating architecture, in this case floating homes, is designed in the meaning of shelter. The floating structure and function of it are the product of the design process (De Graaf, 2009).

Figure 3: Houseboats of Amsterdam (Amstrdam Wonderland, 2016)

Today's world is facing numerous problems such as environmental, and socio-economical. Sustainable architectural practices are valued more than every day for the future of the world. Floating architectural spaces also appear as practices that attract attention in terms of their sustainable features and are considered for planning. The concept of sustainability

contains economic and social policies such as poverty or health, in addition to environmental issues such as environment and climate conditions (Erbay & Özden, 2018). Parallel to this situation, Moon considers the sustainability of floating structures in three dimensions: environmental, economic, and social dimensions (Moon, 2014). This theoretical structure, which is revealed, provides a reference to the method that will allow the floating spaces to be considered in a holistic way. With reference to the main groups of this classification, it is possible to examine floating spaces by adding other existing conditions and features.

Climate changes such as rising sea or river levels, global warming, and natural disasters originating from climate changes (Moon, 2014) are related to the **environmental aspect** of the floating houses. Especially in developing and underdeveloped countries, low-income groups may have not a chance to move from flood-risk areas (Penning-Rowsell, 2020). In this sense, floating structures on the water level would provide durability and protection of the house in case of flooding for coastal/river and lowlands areas (Moon, 2014) by its structural features and mobility (Penning-Rowsell, 2020). A floating structure can also have or access renewable energy sources such as solar and wind energies without obstacles. Also, hydrothermal systems have been used in floating hotels such as Salt and Sill (Sweden), and IBA Docak (Germany) (Moon, 2015). According to the features listed above show that floating spaces create flexibility for both producers and users, provides sustainability and also mobility, reassure to possible sudden damages and disasters that occurred as a result of climate change.

Economic aspect is affected by materials and construction processes. Floating structures come with new material requirements and opportunities (Stopp & Strangfeld, 2010) as different than terrestrial architecture. Most parts of the structure are manufactured in a factory, transported, and assembled, and moored on site. The prefabrication creates the possibility of saving in construction wastes as well as allowing the modular system to contribute to economic sustainability (Moon, 2014). Floating structures also affect the city economy as they establish a relationship with the city apart from their own costs. Especially in metropolitan areas construction grounds have been decreased due to the growth of population and urbanisation. 55.3 percent of the world's population lived in urban settlements in 2018. By 2030, urban areas are projected to house 60 percent of people globally and one in every three people will live in cities with at least half a million inhabitants (The World cities in 2018, 2018). The data present that in the future the cities will be facing a lack of ground. In this case, floating architecture provides a resolution to the lack of construction ground, and also extend the usage of the lands. The new surfaces on water may help to decrease construction prices as an alternative construction ground.

Social aspects contain different conditions belonging to society. Even though Moon treats the social dimension's section as the users' proximity or isolation to the landscape, floating architecture examples can be associated with much more universal problems and produce solutions (Moon, 2014). Globalization created a world without borders. Under the influence of this, the influx of people spread and the population of the cities increased. Climate changes also give acceleration to the influx of people. According to the world bank report, the number of migrants will ramp up by 2050 and over 100 million people will shift to other places (Rigaud, de Sherbin, et al, 2018). New social groups or strata in the society will reveal new needs for housing, public, and recreation spaces. Coastlines and social life are highly related in cities that have sea and rivers. The intervention of mankind changed coastal morphology during the time. After the neoliberal turn, in some cities like İstanbul, coastlines lost their public identity, and the sea culture evaluated in time. Usage of the coastlines and water had decreased and specific spaces had been lost (Burçoğlu, 2008). Floating spaces will offer new surfaces for people to create new relations and provide the society and the culture sustained. In London Carl Turner designed a floating house to solve flood problems in residential areas (Figure 4). CTA also intends to share the project on open source. In this sense, we can evaluate the example in the environmental aspect. However, the prototype also offers many options for potential homeowners. Beyond mass production, 3D printing and CNC milling machines are available for construction. The general idea is that the house could be as components, thus the pieces could be assembled in just a couple of weeks. This opportunity would create economic flexibility and saving. Other examples, such as this one, can be used not only in developed countries but also in developing and underdeveloped countries to provide social relief. Being in an open-source would feed the social aspect of the concept. If we need to examine it through a single example, floating architecture in environmental, economic, and social terms shows multidimensional features and brings innovations (Inhabitat, 2015).

Figure 4: Carl Turner's Floating House (Inhabitat, 2015)

The classification shows that floating spaces are not only structurally interesting. It establishes many spatial connections in environmental, economic, and social areas and offers flexibility by making suggestions. Floating spaces in areas that will be risky for the future of the world such as climate change, large human migrations, and the loss of public benefit of coastal uses, they turn over a new leaf different from all terrestrial architecture. Floating spaces can have been functioned as public, semi-public, and private. By the late of 20th century, they used as pavilions, hotels, educational buildings, recreation platforms such as swimming clubs, baths, public spaces as concert halls, working spaces, research centres, farms, largely, houses, and even memorial buildings. According to these aspects, floating spaces with their beneficial and sustainable features are promising design approaches for the future and encouraging people towards (Duman&Zengel, 2016).

FLOATING SPACES OF ISTANBUL

İstanbul has a special geographical structure and characteristic topography due to its location. The historical city located on the joint point of Asia and European continents. As a result of this, it has many different coastal types, all of which provide different social and cultural experiences. Seaside culture of İstanbul occurred in the last period of the Ottoman State, spread to the public, and became a culture of a wider social group. During the culture of the sea has been evaluating, different genres of spaces had involved in the daily life of *Stambouliotes*. Among the architectural examples that have emerged, there are two different samples that detach themselves from terrestrial architecture. The floating housing of İstanbul will be examined from the floating architecture perspective. For this reason, in this section, primarily, the evaluation of İstanbul's seaside culture and the current environment will be discussed and later the floating spaces which have house function will be examined.

THE SEASIDE CULTURE OF ISTANBUL

Although Istanbul has established different relations with water in many stages of history, seaside culture in its present sense was shaped at the end of the 18th century. Before the seaside and *sayfiye* (summer resorts) culture, *mesire* (picnic areas) culture is widely accepted. The Ottoman society's perception of seaside culture as a landscape and recreation area has transformed, and new practices' becoming a cultural norm started by the Tulip Period and became stronger with Westernization. New public and civil architecture samples have been observed by the influence of transformed sea culture. After the Republic, the spaces that occurred on the coasts of İstanbul had been transformed by the influence of the society and new secular lifestyles. However, as a result of internal migrations, economic changes, and urban policies, the relation with water established in the coast district got weaken.

From the beginning to the latest periods of the Ottoman Empire, the culture of the sea and seaside were not a part of daily life. The city centre is the *Suriçi* area where the palace is located. In the Ottoman society, swimming or spending time by the sea was not a customary habit. Enjoying the sea as a landscape and swimming became a habit and leisure activity not only for Ottoman society but also in Western society in the 19th century, during the Victorian Period (Yağan, 2018). In Britain, people used wooden cabinets called "bathing machines" to go swim, and these cabinets are isolated from the opposite gender and other classes (Figure 6). The bathing machines are not real buildings, most of the time they are pulled by horses (Williamson, 2018). In the same period, more evolved approach which is sea bath was going to be released in Istanbul.

Figure 6: Bathing Machines in Victorian Britain (Williamson, 2018).

The relationship between Istanbul and the sea actually started before the 19th century. In the Tulip Period (1718-1730), new lifestyles such as consuming habits or leisure practices had occurred. In this period when the use of the public sphere is increased, new picnic and seaside areas had released. *Haliç* District was the first mesire district with its large picnic areas before *Boğaziçi*. Later the wealthy *Rum* society of Istanbul preferred *Boğaziçi* as a summer resort district in this period.

Nonetheless, the sea is not used directly in these years. By the 19th century, *Boğaziçi* and Prince Islands became real summer districts. With the *Tanzimat* period, the allowance in the right of foreigners to own property, new habits that were included in daily life after the Crimean War, and the change of social life with Westernization accelerated the summer life. By the 19th century, middle and upper classes had also been created by the new economic and social conditions. The new strata of the Ottoman State had bought summer resorts in districts such as *Boğaziçi* and Prince Islands where they can reach easily during the summer. Istanbul extended through new regions by creating new centres. In these centres new residential typologies were seen (Figure 7). Summer Palaces and waterfront mansions were constructed for the royal dynasty and their officers, ambassadors, and new bourgeois in coastline districts such as *Beşiktaş, Ortaköy, Kuruçeşme, Bebek, Arnavutköy, Yeniköy, Tarabya.* During this period, new summer resort districts as *Erenköy, Göztepe, Suadiye* developed (Alkan, 2014).

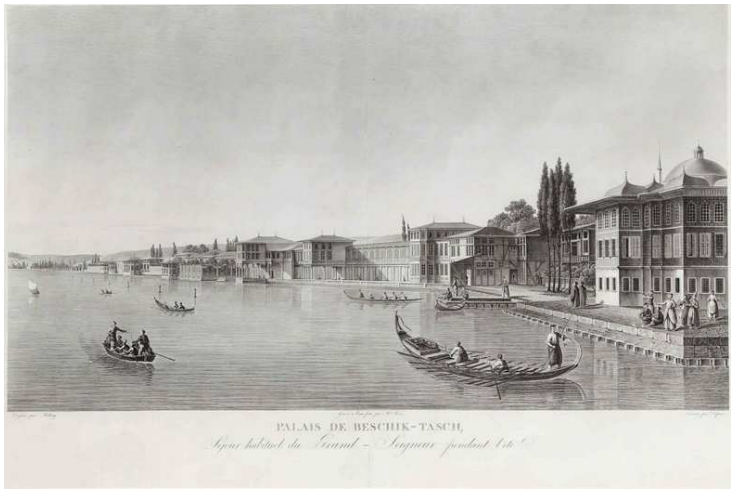

Figure 7: A gravure exhibits *Beşiktaş* Palace and other Waterfront Mansions in European Side of İstanbul (Melling, 1819)

With the spread of seaside culture, people started to swim in sea baths from the second half of the 19th century (Figure 8). Sea baths undertook the mission of transition while swimming habits were developing (Yağan, 2018). Sea baths were built as spaces standing on stilts, with a pool in the middle, and surrounded by wooden curtains. The samples that are built for public use were constructed 15-20 meters away from the coastline and removed at the end of the season (Figure 9). The samples that are built for the owners of the waterfront mansions had stood for the whole year. The rules and borders of construction are defined by the regulations named *Umumi Deniz Hamamları Nizamnamesi* which was established by İstanbul Municipality. These structures constructed for men and women separately and located away from each other to prevent the communication of two genders (Şahin, 1994). The sea baths can be included in architecture on water according to its form and construction type.

Figure 8: Sea bath in *Makriköy (Bakırköy)*. It is clearly understood that the structure on the water and linked to ground by the help of a simple bridge (Pera Musem, 2018)

Figure 9: Sea bath for women in Moda can be seen in the right bottom of the photo (Mimdap, 2014)

At the beginning of the 20th century, numerous sea baths were seen on both sides of Istanbul. During the period of Armistice, the concept of picnic had gained a new definition. In this period, White Russians who left their country because of the Soviet Revolution brought the fashion of the beach (Toprak, 1994). Besides Russians, Brits also went swimming men and women together in *Florya* (Şahin, 1994). Russians opened new consumption spaces named French that have their functions like food and beverage, fun, and others in there. After a while, taverns called *Koltuk Meyhanesi* and wooden structures alike bath cabinets were seen among the seaside (Sperco, 1989).

Figure 10: A look from Ataköy Beach. The cabinets and buildings can be seen in the photo (Bora & Bora, 2015)

New beaches such as *Menekşe, Fenerbahçe, Ataköy, Kalamış, Caddebostan, Suadiye, Moda* and *Süreyya* were seen on the stage in addition to *Florya* Beach by the effect of the social structure transformed after the Republic and secularism. Beaches after transformed from sea baths became public spheres where the women and men spent their time equally (Figure 10). According to Toprak, beaches transformed into the venue also so *casino*s (open-air cafes, term is adopted from Italian), restaurants, coffee houses and even stages are opened (Figure 11). These functions create a place for families also. There are family *casino*s on some beaches (Toprak, 2018a). Besides the entertainment, sport activities such as swimming and diving on some beaches such as *Moda* and *Kalamış* (Pera Müzesi, 2018).

Figure 11: Comfortable luxury rooms, jazz and casino, warm see, fine sand and easy access: An advertisement of *Süreyya Plajı* in Maltepe. A modern woman figure who wears bikini is also on the focus. It represents secular daily life of Republic (Pera Museum, 2018)

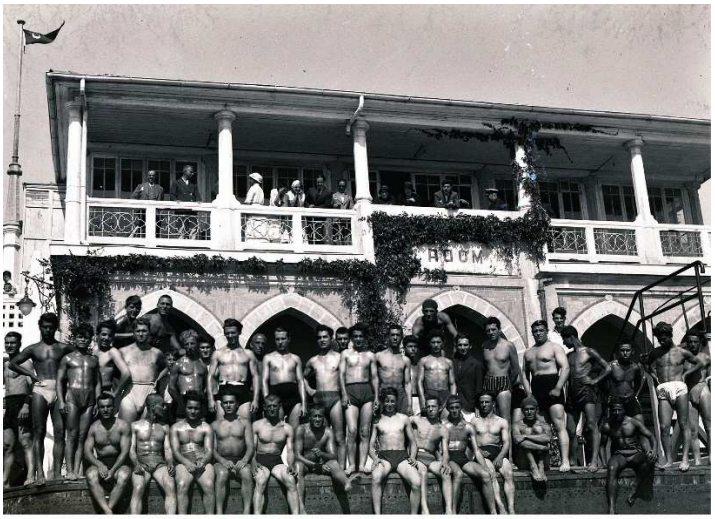

Figure 12: Young swimmers in Moda (Toprak, 2018a)

In the first years of the Republic, there are clubs related to sea and water activities in districts *Moda* and *Büyükada. Moda Deniz* Club hosted rowing races, especially on Maritime and Cabotage Day (Figure 12). It is known that Atatürk's favorite races are held in *Moda*. Prince Islands also became famous for its beaches. Before then, there were sea baths like other regions of Istanbul. However, with the new bourgeois, especially *Büyükada* was preferred for summer days (Pera Museum, 2018). On the other side of Istanbul, in *Florya* Beach, there is a Marine Mansion designed by Seyfi Arıkan. This building also presents how important seaside culture is for modern Turkish society and publicity. In addition to the idea that the building has references to the transatlantic aesthetics of the period, there is a claim that it has a local reference. Esra Akcan claims that Marine Mansion refers to traditional sea baths and follows their forms (Akcan, 2009; Güney 2019). Marine Mansion or Florya Mansion were built on stilts and linked to the ground by a bridge (Figure 13-14). Even it is a federal summer residence, Atatürk (Figure 15) went swimming from there (Mimdap, 2017). In this sense, the claims are not unfounded considering the structure of the sea baths. But the strong aesthetics of waterfront mansions should be remembered. In every case, from the waterfront mansionss to the Marine Mansion, summer house culture transformed and spread to other social groups of society. The sea culture of İstanbul is a well-known and experienced fact until recently.

Figure 13: Florya Marine Mansion from air (Mimdap, 2017)

Figure 14: Florya Marine Mansion on from seaside Mimdap, 2017)

Figure 15: Atatürk and people are in the Florya Beach. The buildings can be seen behind the crowd (Torpak, 2018a)

With the *Florya-Sirkeci* coastal road built in the 1950s, a significant part of Istanbul has been disconnected from the seaside. At the same time, the use of beaches was abandoned due to the increasing pollution in Marmara. Between 1940 and 1980, the demographic structure of Istanbul had changed rapidly due to internal migration (Toprak, 2018b). The coasts have been filled due to the increasing land need in the process until today, and the historical topography of Istanbul has been damaged. The filling areas were created to be opened to the use of people, but the coastal roads were enlarged through them. The new squares and recreation areas on the filling areas are ill-defined and not proper for the human scale. The road is disconnecting the relationship between new coastlines and territory also. By 2017, the filling areas reached 2.55 km like a new district (Hürriyet, 2017). As a result of the interventions from the 1950s to today, the sea culture of Istanbul was completely reduced to the landscape. Today, although landscape studies or projects are carried out to establish the relationship of the people of Istanbul with the coast, these projects are an eclectic effort and have not succeeded in bringing back Istanbul's strong sea and sea culture.

FLOATING HOUSES of ISTANBUL ON THE SEA

During the development of sea culture in Istanbul, there are alternative design approaches that had occurred. In 1939, Architect Ahsan Yapanar and in 1970 Arhictect Melih Koray and his partner Architect Ergin Gömüç designed floating houses. These structures were seen in the period when the sea culture was alive and common among the wide social groups.

In this sense, the floating spaces are progressive and reformer even for this period and encourage us for today and the future.

Ahsen Yapanar reports the *Yüzenev* (Floating House) Project, which she designed in *Arkitekt* magazine in 1939. The floating house, which is a residential design large enough to accommodate three to five people, has a living room, bedroom, kitchen, toilet and a small terrace in front (Figure 16). Since the roof of the building is flat, it acts as a platform for sunbathing and jumping into the sea (Yapanar, 1939). It is possible to follow the architectural style of the period in her design: Modernist lines, portholes, form of the building reminds as transatlantic style (Güney, 2019). The design approach of *Yüzenev* makes the structure architectural product because of the aims and practices (Figure 17).

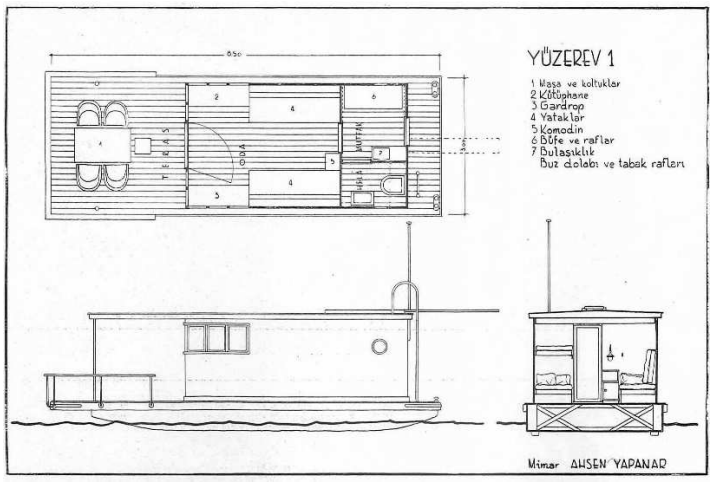

Figure 16: First plan of Yapanar's Floating House (Yapanar, 1939)

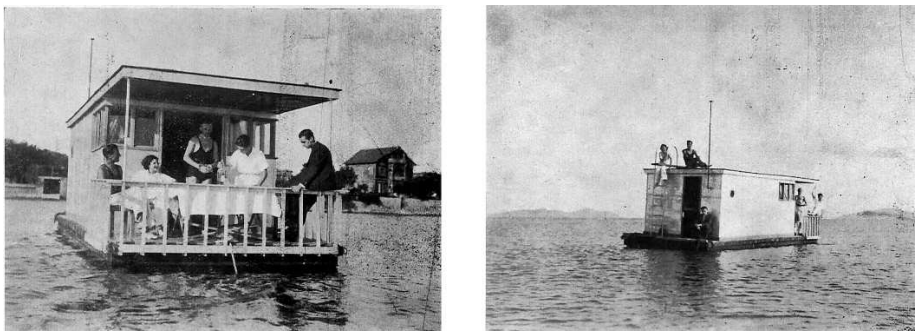

Figure 17: *Yüzen ev* from different perspectives (Yapanar, 1939)

In another article about Yapanar's design which is published in 1947, it is mentioned that the *Yüzer Ev* (Floating House) project has electricity and a motor that provides it with movement. In the same text, it is emphasized that the structures built according to marine structure standards. The structure constructed with resinous wood and covered with plywood. The roof covered with a material that provides isolation (Arkitekt, 1947). When the plans and sections are examined, it is understood that the structure is constructed as a house due to layouts and furniture choices (Figure 18). If we compare two projects of Yapanar, it is blindingly obvious that the design and construction system are developed in eight years (Figure 19). Until the 1970s, various floating structures on Marmara and Bosporus are seen in photos, and then some, it is announced on the poster of the *Denizcilik Bankası* that anyone who has a deposit account at the bank can own the Floating Mansion by draw. However, the forms of these structures look like boats more than designed structures (Denizcilik Bilgileri, 2019).

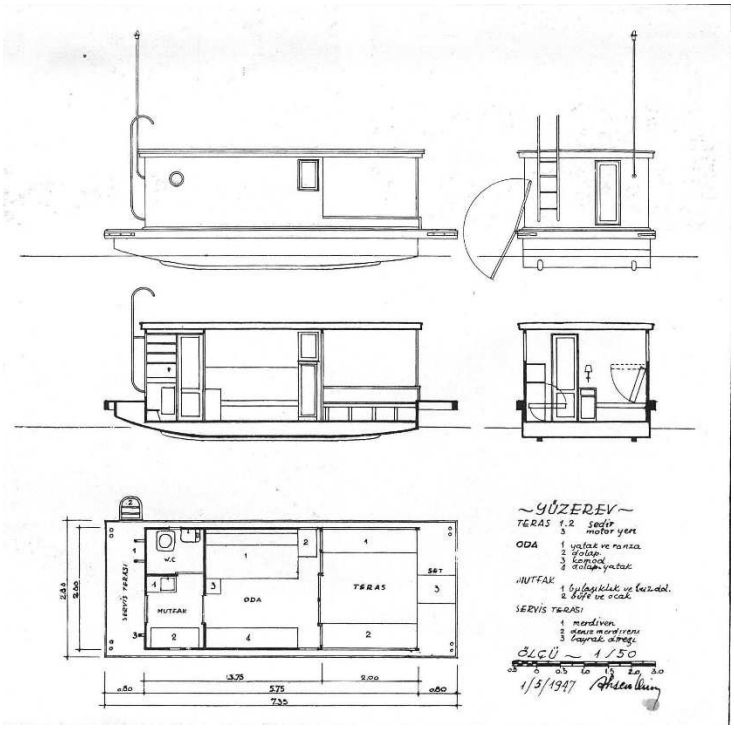

Figure 18: Plans of *Yüzer Ev* in 1947 (Arkitekt, 1947)

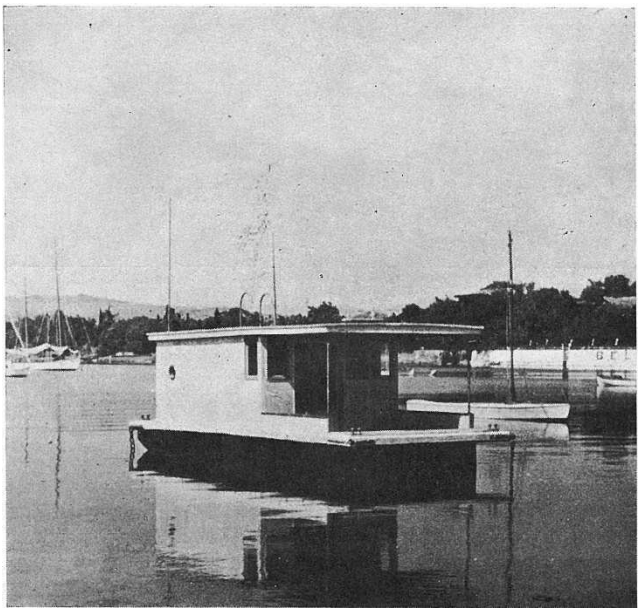

Figure 19: The form of the structure (Arkitek, 1947)

Figure 20: Other floating houses are on the sea. It can be observed that main approach has been transformed (Denizcilik Bilgileri, 2019)

In 1970's, *Katamaran* House designed by Melih Koray and Ergin Gömüç locatedin in Kalamış coast. *Katamaran* House is a two-storey residence placed on two boats. The architects aimed for mass production of the floating structure. Related to this, they announced that first cost is 50.000 liras, but the cost would decrease to 35.000 liras by the help of mass production (Güney, 2019). In a news of this structure, a subtitle is remarkable: "In Istanbul in summer, in Antalya in winter." This phrase points to the mobility of the structure. There is no specific information about materials but wooden materials are understood from the limited photos (Mimdap, 2014). *Katamaran* house exhibits a different spatial organization than previous examples due to being two-storey house. There lays sleeping area on the upper floor, and living and fun areas on the ground floor. The architects designed for the dining room bar to create a leisure and fun place in this house (Figure 20). *Katamaran* House projects were not sustained after it was damaged by a fire (Güney, 2019).

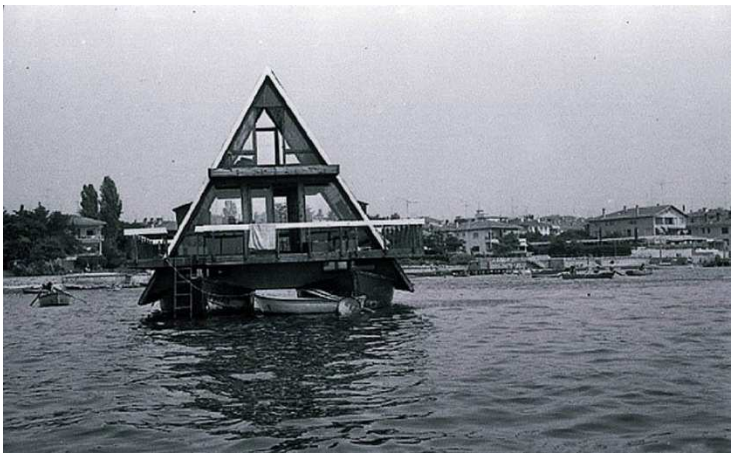

Figure 20 Katamaran House on the Marmara Sea (Denizcilik Bilgileri, 2019)

CONCLUSION

The designs of Yapanar and Koray&Gömüç are the approaches that take forward the examples of architecture on the water seen in Istanbul. Today, although there are suggestions for floating architectural examples in our country, they either remain simple structures or their references are yacht aesthetics. But when the world and specific examples in Turkey, it is observed that there is a design approach of all. *Yüzen ev* or *Yüzer Ev* (two different use were stated originally in the Arktiekt magazine) and *Katamaran* House contributed to the spaces that were occurred as a result of the rich seaside culture of İstanbul which is evolved in time by bringing an alternative approach. Even their continuity couldn't be provided, the floating spaces establish strong references for the future.

The floating spaces of Istanbul have similar features to other floating structures. First of all, as De Graaf emphasized, they were designed as (1) floating space, and (2) house. It is out of the question to transform another typology into a house like the houseboats example. These spaces designed with an approach and concept and the qualifications make them architectural production. Yapanar, followed the architectural style of the period, established spatial organization according

to function, designed furniture according to revealed void. Koray and Gömüç, refers to traditional hunt or chalet in their design. They created a weekend or holiday resort so designed according to leisure time perception of the period. They add a second floor bravely even today it is revolutionary.

One another feature that makes these structures important is mobility. Scholars who study floating architecture discuss mobility in the field of environment, landscape, social dimensions. As we examined, both designs have the ability to move to other locations on the sea. Besides providing a great landscape view, it would protect users from environmental and climate problems if they still existed.

The components of floating structures are suitable for prefabrication. This opportunity saves time and money. Although *Yüzer Ev* and *Katamaran* House aimed mass production purposes. In this sense, both samples were designed to allow mass production and cost calculations were made. Even the conditions of the period would not provide their continuity, they still offer important bases for today.

Today, the production and delivery of materials that enable water-related design are wider than in previous years. Fiberglass, woods, steel or aluminium allow more flexible designs for contemporary floating spaces. New construction methodologies and materials have been established with the help of technology. Yapanar, and Koray&Gömüç used the existing materials for their design.

Floating places of Istanbul are important examples that reflect the point where the city's sea culture has come. Apart from the floating house and the Katamaran House, the examples viewed from the photographs and advertisements reveal that floating structures - houses in this sense - can be preferred by other strata of the society.

Istanbul is one of the mega cities at the focal point of the world. Environmental, economic and social problems in the world affect the city as well. If we need to propose a projection for the future of the city, it is obvious that with the reference of the two examples examined, floating architecture examples will contribute to the production the space in different dimensions. With the effect of globalization, the permanent and temporary population of Istanbul is increasing day by day. It is not possible to eliminate the interventions in the city such as filling areas or roads. In this sense, by the help of floating spaces are used for functions such as housing and accommodation, culture and art, education and recreation, in İstanbul,

- the use of urban land can increase. New public buildings in different functions such as culture, education, health buildings can be constructed.
- attention to the sea can be promoted again by reviving the coastal relations from a different perspective
- the spatial needs of increasing population and density can be solved with mass production and low-cost structures
- thanks to its design principles, by using ecological materials and techniques, it can make great contributions to the economic, environmental and social sustainability of the city

Considering the future of the world, it is obvious that terrestrial architecture needs new alternatives at many points. It is important to become a sustainable city in order to exist in the future. Cities such as Istanbul that provide historical, topographic, climatic and economic conditions also provide a suitable environment for floating architecture. In this sense, it is possible to foresee that floating architecture examples will be seen again in Istanbul and later on other coasts of our country.

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THE ROLE OF ARCHITECTURE FOR THE FUTURE OF CRUISE SHIP TOURISM IN A POST-COVID WORLD: SEARCHING THE ROADMAP FOR CRUISE SHIP INTERIOR DESIGN IN A POST-COVID WORLD

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ABSTRACT

In recent years, cruise tourism has seen increased demand and has become a preferable choice worldwide until the COVID-19 outbreak. The coronavirus pandemic has been decimated cruise ship tourism similarly to a significant part of the other tourism industry. International travels are begun to restrict, and countries around the World ban non-essential travels. In response, major cruise companies have suspended operations. These restrictions and suspensions have had an unprecedented impact on the cruise tourism industry.

There are studies for implementing health and safety protocols to adopt the worldwide transition process at all tourism points. The cruise industry needs to implement this transition into cruise ship design and use it to reconsider the cruise ship design. A new roadmap is required to improve retrofit ships and new-build ships. In this roadmap, the collaboration of architecture and tourism disciplines should contribute to this reconsideration. Besides, high investment costs and the long life span of cruise ships make the design more critical because of the long-term effects. So today's steps are crucial for the healthier, well-designed cruise ship environment in the future.

In this study, the role of architecture for the cruise ship environment's future in a post-COVID world was discussed with possible architectural and spatial scenarios for cruise ship design. For this reason, the idea that taking references from terrestrial architecture is evaluated together with the approaches of considering cruise ship as a floating city. The critical design factors were examined for the post COVID world for cruise ship interior design.

Key Words: cruise ship interior, floating space

INTRODUCTION

Until the COVID-19 outbreak cruise tourism has seen increased demand and has become a preferred choice worldwide. Cruise tourism was the fastest-growing sector in the tourism industry up until 2020 [1]. Due to the suspensions of cruise lines operations and restrictions of international travels cruise tourism for a response of covid 19 has had an unprecedented impact on the industry.

The coronavirus cases in cruise ships showed the need for design changings to adopt the new normal in cruise ships. So health and safety protocols must-have design implementation for cruise ship environment for post covid World. The reason for this study is to reveal the need for new design impact requirements and discuss the role of architecture for the cruise ship environment's future in a post-COVID world that was discussed with possible architectural and spatial scenarios for cruise ship design.

For discussion of possible architectural and spatial scenarios, two approaches can be helpful. The first approach is examining terrestrial architectural design impacts and taking these impacts as references because of the spatial experiences that this field has more. The second approach is considering the cruise ship as a floating city in this manner; the possible implications must be considered with the scale of a city.

THE CURRENT CONDITION OF CRUISESHIP TOURISM AFTER COVID 19

To examine the current condition of cruise ship tourism, the process must be examined, which captures the covid outbreak and virus cases in cruise ships; halt, suspension and restriction of operations and cruise ships which kept sailing or returned an oceangoing cruise ship service while others not.

The virus that causes Coronavirus disease was first detected in Wuhan, China, on December 31, 2019. This disease was identified as "2019-nCoV" on January 7, 2020 by Chinese authorities. The first Covid 19 case was confirmed in the Diamond Princess cruise ship on On February 3, 2020, with confirmation of 10 person tests as positive for COVID-19 [2] and until April 30, there were 712 infected, 13 dead, and 645 recovered [3].

And many coronavirus cases followed. According to Public Health Responses to COVID-19 Outbreaks on Cruise Ships, COVID-19 outbreaks have caused more than 800 cases among passengers and Crew, including 10 deaths during February–March 2020.

The WHO (World Health Organization) declared COVID-19 as a pandemic on March 11, 2020, officially. The Princess Cruises; Disney Cruise Line; Viking; Norwegian Cruise Line; Royal Caribbean Cruises; Carnival Corporation & Plc and MSC Cruises halted their fleet and suspended their cruises between 12 -14 March 2020 [4].

The CDC issued a No Sail Order for at least 100 days for cruise ships that carry more than 250 passengers on April 6, 2020. The No Sail Order is extended until September 30, 2020, on July 16, 2020, by the Centers For Disease Control and Prevention's [5, 6].

Some cruise operators are begun to sail again in Europe, which concluded an outbreak. The Norwegian cruise operator Hurtigruten was the first cruise operator worldwide to return an oceangoing cruise ship to service in August [7]. After the virus spread among crew members and passengers of its, a 530-passenger ship that cruises Arctic waters a month and a half after restarting them. Large cruise operators haven't sailed in the U.S. for about half a year after coronavirus outbreaks on ships triggered sailing suspensions and tangled efforts to repatriate passengers and crew.

NEEDS FOR RECONSIDERING THE CRUISE SHIP DESIGN

The first coronavirus case has occurred at Diamond Princess. The Diamond Princess has more than 3.700 passengers and Crew on board. The number of crew are 1.100 and guests are 2.670. It departed from Yokohama port, Japan, on January 20, 2020, and returned on February 3 after making six stops in three countries. Because in February. 2, an 80-year-old passenger, who had departed January 25 in Hong Kong, was confirmed to have the coronavirus. Since then, the Diamond Princess has been quarantined off Yokohama, with about 3,700

people on board. Three hundred eighty-one people from the ship who were symptomatic and tested positive, thirty-seven needed intensive care and nine died [4].

Guests were quarantined to their cabins. Food and beverages were distributed three times a day to guest rooms via a daily menu. Crew members have fulfilled their duties after an initial health screening. When not working, crew members were requested to be in their staterooms [8].

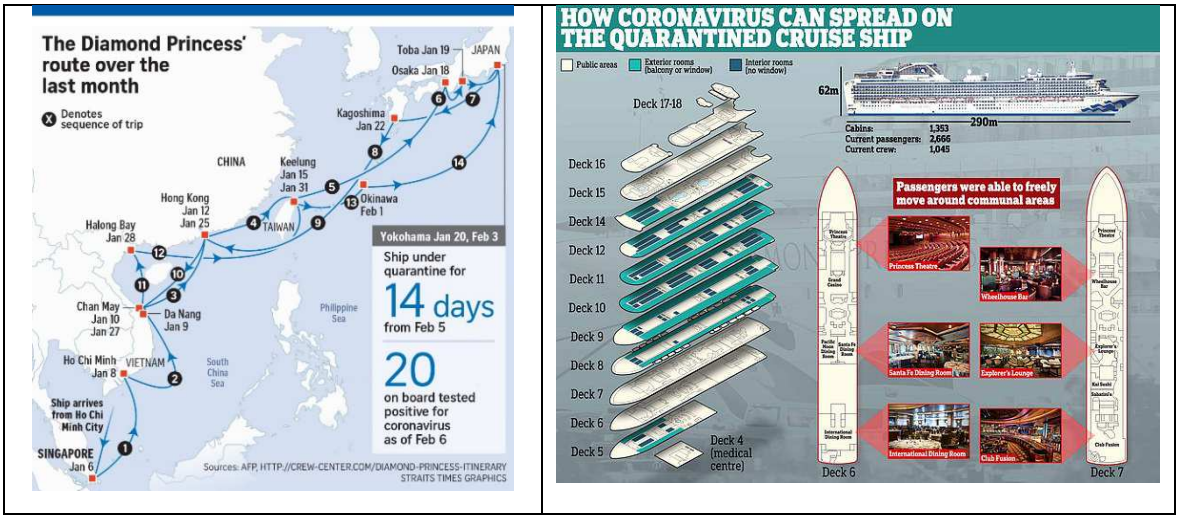


Figure 1,2 Left: The Diamond princess route during the quarantine [8] Right: The Diamond Princess decks and guest room types [9]

Diamond Princess is built 2004 and last refurbished in 2020 following the Coronavirus outbreak. Diamond Princess completed a deep cleaning project. The Yokohama-docked vessel was cleaned and disinfected. The ship was certified and cleared. The cruise ship entered a wet dock for interior refurbishment in Japan (fabrics were replaced) [11].

Types of cabins are premium suite with balcony, a penthouse suite with balcony, cabins with balcony and cabins without windows [4]. Its length is 290 m, height is 62 m and tonnage is 115.875. The Diamond Princess has 18 decks and has 1337 guest cabins for 2670 passengers served by 1100 crew/staff. The ship has 9 restaurants and bars, 6 lounges, 4 swimming pools, 8 jacuzzies, 14 elevators. Passenger-use laundromats are located on decks 5, 8, 9, 10, 11 and 12 [11].

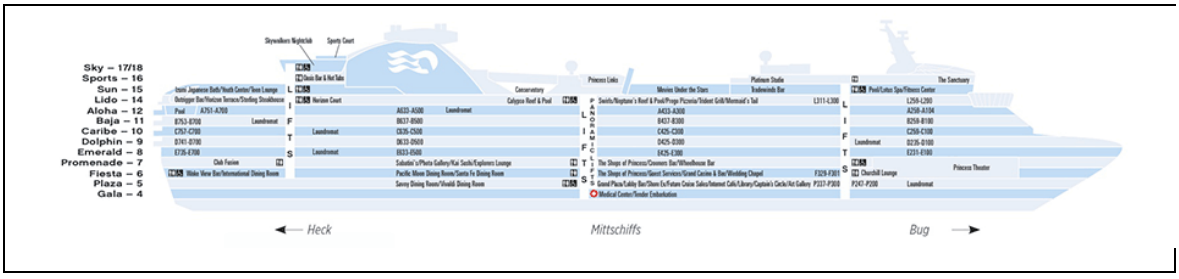


Figure 3: The Diamond Princess schematic section shows decks ans elevations [11].

Tokuda et al. (2020) [12] provide learning points formulated as recommendations for future control of infectious disease outbreak from the covid case of Diamond Princess. Some of these recommendations are related; early isolation of exposed staff, separated administrative workspaces area which (should be limited to enforced green zones learned from poorly ventilated dining rooms which is used for administrative spaces might be caused cross-contamination), needs for early and clear demarcations of contaminated and noncontaminated areas, the importance of adequate inter-organizational coordination and communication, adequate levels of cooperation, communication, command management among multiple relevant organizations responding to the crisis."

The Princess Diamond case has shown that there is a need for reconsidering cruise ship design because of the increased contamination and hard quarantine conditions. This information about the coronavirus case on this ship shows that there is a need for reviewing the cruise ship environment.

Dining Room

Walkway

Medical Room

Demarcantians Of Zoning Area

Figure 4,5,6,7: Images from Diamond Princess [12]

Two expert opinions about cruise environments show that cruise ship environments facilitate the spreading of viruses. According to Jean-Paul Rodrigue, air circulation is worse than on an airplane." Because air circulation in cruise ships is not from outdoor and clean air, corridors are not open and some cabins are without window, as a result these ships has the ideal environment for spreading of viruses. According to William Schaffner, "A cruise ship is an almost ideal environment to enhance the transmission of a virus, whether norovirus, coronavirus, or flu, from person to person." Because Crew are sleep in dormitories, sharing toilets and dining rooms. They work with face to face contact [4]. The passenger of ship has some hard times, especially passengers who stayed in their cabins without windows or balconies. Below the deck plan the blue-colored areas show cabins without windows.

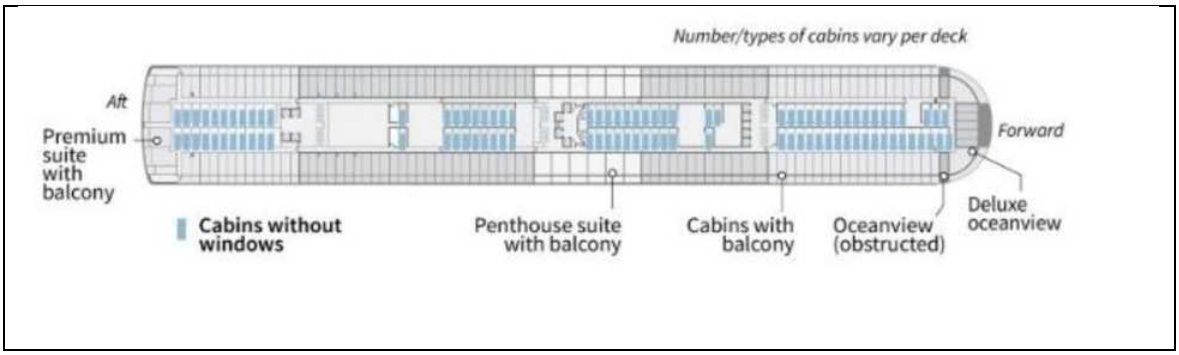


Figure 8: Cabin types [14]; [12]; [4]

The public spaces like lounges, dining rooms, bar and club areas plan scheme must be reconsidered in terms of square meter per person and hygiene conditions with consideration of personal distance and avoiding contamination of the virus. Also, in the case of pandemic outbreaks, the cruise ship interior must need flexibility for demarcations of the zoning area. Social distancing and quarantine must be considered as a design problem. The need for healthy spaces highlighted with the covid 19. So the well-being of passengers must be reconsidered in such catastrophic conditions as well as normal times.

RESPONSE TO COVID-19 BY CRUISE INDUSTRY

The industry started to discuss and construct some responses to the pandemic. There have been such studies, such as panels and webinars, by leading names in cruise design and outfitting to discuss the current condition of cruise tourism. Institution recommendations and proposals of safety measures released (America's Passenger Vessel Association, European Maritime Safety Agency, The Cruise Lines International Association) and new steps for protection were considered. Practices and new technological methods developed using borrowed technologies with collaborative steps.

A PANEL SET UP BY ROYAL CARIBBEAN GROUP AND NORWEGIAN CRUISE LINE:

The Healthy Sail Panel has submitted a report to the (CDC) to start operations again after a long halt due to Covid-19. The panel included experts in medical practice and research, public health, infectious diseases, biosecurity, hospitality and maritime operations. According to Healthy Sail Panel chair Governor Mike Lea "The panel's recommendations are focused on the best scientific and medical information and mitigating public health risks to those who sail." Additionally, detailed plans need to be implemented to address infections onboard, including contingencies for onboard treatment, isolation and rapid evacuation and repatriation [15].

CRUISE CONVERSATIONS WEBINAR CALLED COVID-19: PUTTING A POSITIVE SPIN ON THE ELEPHANT IN THE ROOM IMPLEMENTED:

Hosted by Toby Walters, CEO of Cruise Ship Interiors Expo America, the panel comprised of My Nguyen, Director Interior Design & Operations, Seabourn & Holland America Line, Petu Kummala, Senior Director of Interior Design & Architecture, Carnival Cruise Line and Mike Oliver, Co-owner & Co-chairman of Trimline. In this webinar the response by the designers, outfitters and suppliers were mentioned and the possible opportunity to be found in the impact of COVID-19 on cruise design [16].

CRUISE LINES PROPOSE COVID-19 SAFETY MEASURES TO CDC:

The Cruise Lines International Association released a plan that calls for implementing tighter controls to keep infected people from boarding ships, reducing transmission through air management, as well as steps for addressing positive infections aboard. Accordance to these: Ships would allocate cabin capacity for isolation and other operational measures for medical needs, as well as arranging in advance with private providers for shoreside quarantine, medical facilities and transportation. To minimize the pathogen's spread, encouraging cruise lines to enhance sanitation practices and upgrading their HVAC systems to MERV 13 filters were noted [17].

NEW STEPS AND NEW TECHNOLOGICAL METHODS FOR PROTECTION USING BORROWED TECHNOLOGIES DEVELOPED:

The cruise ship industry focused on passive and active protection, which relies on science and spacing to make its vessels Covid-19-free. New projects for limiting the presence and spread of covid-19 on cruise ships developed with a collaborative manner. Engineering and ship design firm Foreship's launched "Project Hygiea" that aims to limit the presence and spread of COVID 19 and other pathogens on cruise ships. Mattias Jorgensen explains project Hygiea with comprising four-step approach of interception, prevention, mitigation and evacuation. He notes about an approach which needs to draw from a multitude of different processes, from design changes to technology upgrades." [18]

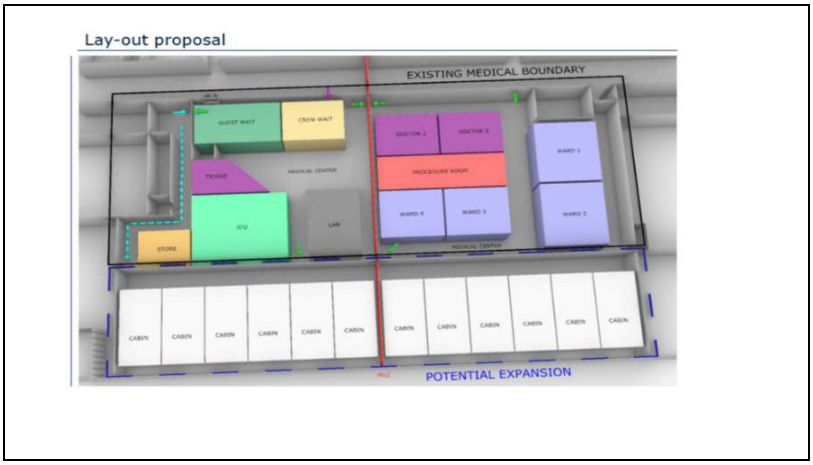


Figure 9: medical centre expansion lay out proposal of "Project Hygiea" [18]

"Stage one aims to keep the biohazard off the ship. Ports will be designed for the efficient interception, with technology installed for testing and measuring body temperature, for example. In the event that a vaccine becomes widely available, passengers will be screened for vaccination before being allowed to board.

Stage two is about preventing the virus from spreading, which means employing stringent hygiene measures and optimizing spaces and routes to maintain a safe distance between individuals.

Stage three is a matter of isolating the pathogen through quarantining and decontamination. Technology such as air treatment systems and medical facilities will be provided to support these efforts.

Stage four focuses on preparation for the worst-case scenario: critical incidents on board. Evacuation procedures will be put in place, with routes through the ship designed for speedy extraction, while emergency suits, capsules and craft will be made available." [19]

According to Parker (2020) [20]; the industry has a tendency to approach passive and active protection. Princess Cruises, Virgin Voyages, MSC Cruises are the cruise ships that have new systems and measures for this reason.

For passive protection impacts:	**Active prevention**
-**antibacterial painting treatment and sanitizing** for hard surfaces (doors, tabletops, bars, outdoor seating and fixtures etc) -**touchless cruise experience** (Princess Cruises' Ocean Medallion device allows touchless cabin entry, activates the door automatically) -**lesser interaction**. (Virgin Voyages Scarlet Lady sensors can detect whether a cabin is occupied or not to avoid non-essential interaction between staff and passenger) -**the body temperatures monitoring** (thermal cameras) -**prefabricated architectural elements.** (sliding window kit for natural ventilation in busy areas) -**cleaner vessels** with new air purification system (**Virgin Voyages's air purification system**)and ultraviolet light technology borrowed from from **airline industry** and hospitals and laboratories.	-**reducing passenger numbers** to make public spaces much less crowded. -**directing the movement of passengers** to avoid unnecessary contact. (MSC Cruises' smart system – MSC for Me – is a wrist band ensures that public areas do not become overcrowded.) -"**Cleaning and disinfecting frequently touched objects and surfaces**" the America's Passenger Vessel Association (PVA) recommends. (keyboards, telephones, handrails and doorknobs) -**reconfigured workstations** with Six feet of separation is considered -**arrangement of floor plans** for common dining areas with at least six feet of separation– between table setups (booth seating, physical barriers) -**reorganised restaurant service areas** with orders taken from apps on mobile phones instead off buffet to limit queuing.

Table 1: Parker (2020) The protection method for cruise environment and possible chancings [20]

DISCUSSION OF NEW ARCHITECTURAL AND SPATIAL SCENARIOS FOR CRUISE SHIP INTERIOR AND DESIGN IMPACTS POSSIBILITIES

There are studies for implementing health and safety protocols at all tourism points to adopt the worldwide transition process. The cruise industry has started to implement the outcome of this transition into cruise ship design and needs to use the opportunity to reconsider the cruise ship design with active and passive protection methods for covid and other pathogens in a collaborative manner. These methods rely on science and spacing, basically with reconsidering the environmental control systems and social connections and the use of public spaces are confined to the parameters of social distancing guidelines. Parameters like hygiene and social distance made health and infection control as the main focus for the cruise environment. The renewed focus on healthy environments and infection-free environments may provide positive COVID-19 design impacts on interior design for post covid cruise environment. Short, medium, and long-term changes can be challenging and refreshing for cruise environment. Passenger experiences will change accordingly to the new cruise environments. How to adapt to the worldwide transition for new normal is crucial for cruise ships. A new roadmap is required to improve retrofit ships and new-build ships. In this roadmap, the collaboration of architecture and tourism disciplines should contribute to this reconsideration. Taking references from terrestrial architecture might be helpful to discuss or try to foresee further chancings for new architectural and spatial scenarios on cruise environments. For this purpose, examining terrestrial architectures land-based interiors design impacts for workspaces, hospitality venues, health facilities, dining venues, educational spaces and living spaces that quickly keeps up with this transition can be seen as design implications for cruise environments. But because of the cruise ships scale, the cities' reactions to covid must be examined to see the bigger image.

REFERENCES FROM TERRESTRIAL ARCHITECTURE- LAND BASED INTERIORS DESIGN IMPACTS

During the suspensions of cruise operations, people continued to use a terrestrial architectural environment. Supermarkets, offices, restaurants, cafes, shopping malls, schools gradually and there were existence spaces like Hospitals, senior living spaces. So it is possible to use terrestrial architectures experiences and new design requirements and also regimes as references for cruise ship environments.

office environment	- high partitions will emerge to improve infection control in the office environment also provide more acoustical and visual privacy, focus and productivity throughout the day. -placing PPE kiosks prominently and abundantly.
educational area	To maintain social distance in the educational area, larger educational classrooms with more separation between desks are needed and also widened corridors to accommodate the six-foot social distancing rule. The additional space requirements emerged. Temporarily utilizing larger spaces such as gymnasiums or large group instruction areas to meet social distancing guidelines. -placing PPE kiosks prominently and abundantly.
dining venues	--adding handwashing stations in accordance with CDC guidelines - PPE kiosks - will likely decline of self-serve buffets. -cleaning regimens and use of cleanable, bleach-resistant and durable textiles with high double rub counts. -larger dining tables to create more separation between diners. -separations or other ways to create separation (there are some inappropriate methods like social distance with mannequins and stuffed animals filling empty seats in restaurants because of the difficulty of effectively sanitization.)
senior living areas	- short-term policies for visitors, interaction, cleaning, and physical building infrastructure. (increased feelings of isolation, boredom, and frustration etc from the disruption to their daily routines.) -Medium-term changes must address ongoing physical distancing needs while allowing for more social interactions with balancing disease risk with freedom and independence.
Health facilities	-Strategies for resilient hospitals: hybrid typological configuration, Healthcare Digital Innovation, Innovative Finishing Materials and Furniture, HVAC and Indoor Air Quality, Patient Safety and Quality

	Improvement, User Centeredness. Inclusion and Evidence-Based Design, functional Programme, Access and Flows Management (Capalongo et al,2020) -Construction strategies used in healthcare systems: Modular construction, Adaptive reuse, Lightweight architecture
hospitality	- IT, AV, and new HVAC systems -sanitation - Antimicrobial materials, especially in high-traffic areas -separations for social distance

Table 2: References from terrestrial architecture [21], [22]

When these conditions are considered, hygiene, healthy spaces, the well-being of user and flexibility will be key parameters for future planning and programming of interiors. Accordingly, material choices, Bolstering technology resources, humidity control, and cleaning furniture and physical spaces needs to be thought thoroughly. Integrate handwash stations, hand sanitizer, masks, tissues and trash disposal in the interior must be considered. Maintaining maximum air quality, ventilation and water quality standards with proper ventilation and air filtration are essential for distributing clean, outside air to promote healthy indoor air quality. Material selections must non-leaching antimicrobial surfaces being low-emitting, easy to clean like removable rugs, carpet tiles or alternative hard surfaces. COVID-19 is leading architects, interior architects and designers to revise at design principles for interiors considering well being of user. Furthermore, sustainability and responsible design concepts occurred with these reconsiderations. Some scenarios can be designed based on information which we can be borrowed from terrestrial architectures land based interiors. In particular, reconsidering common areas will be important in creating a safer environment. The question of how the experience will be different for passengers onboard is important for the post covid cruise ship environment. From dining and recreation to rules and regulations will changes the cruise experience with new design impacts.

REFERENCES FROM TERRESTRIAL ARCHITECTURE- LEARNING FROM CITIES

Cities have been at the forefront of the pandemic, and have provided multi-dimensional responses to allow their inhabitants to better respond and adapt to the outbreak. Lessons learned for better preparedness for future emergencies.

Experiences in fighting the pandemic and address the fundamental questions COVID-19 is raising concerning sustainable and symbiotic urban development.

The Learnings from cities can be used for redesigning the cruise ship interior because the cruise ship acts as a small city because of its population and function densities and varieties.

Megahed and Ghoneim (2020) [23] studied what the "antivirus-built environment looks like based on the lessons learned and the importance of designing a healthy and sustainable built environment" in their article called "Antivirus-built environment: Lessons learned from Covid-19 pandemic". According to [23] to minimize the risk of infectious diseases, people redesigned interior design, architecture, cities, and infrastructure that concluded built environment, which is shaped by diseases from interiors to city planning. In the last two centuries, architecture and urban has Urban renewal, Sanitary reform, Building and housing reforms, which is deeply related with pandemics.

There is an opportunity to reset and reshape our built environment comes with the pandemic. Their study analyzes two approaches: Look step back to nature and Look step forward to advanced technology.

The first approach includes urban approaches as expanding horizontally, fewer density cities, decentralization, urban farming, fewer cars, more cycling, and walking and architecture approaches like self-sufficient strategies, refocusing on green spaces, low-rise buildings and better air quality.

The second approach includes construction strategy as Modular construction, Adaptive reuse, Lightweight and adaptable structures and hygienic building materials and digital transformation as the ability to work from home.

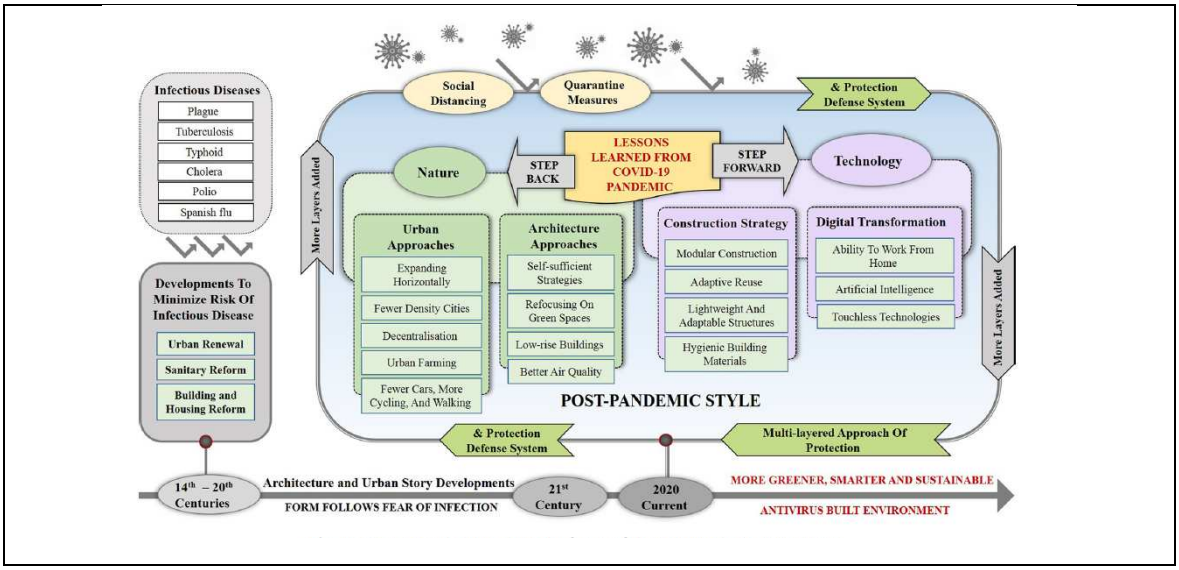


Figure 10: The proposed vision about the future of the antivirus-built environment (Megahed, Ghoneim,2020) [23]

According to [24] Salama, A. (2020), lots of implications and potential areas influences architecture and urban design. These implications mostly focus on newer understandings for healthy environments, new mobility and movement understandings, lesser active encounters, appropriate work and standards of home environments, density management, air pollution and sanitation. Considering living and working patterns, urban dynamics and distance measures together might help to design for new normal.

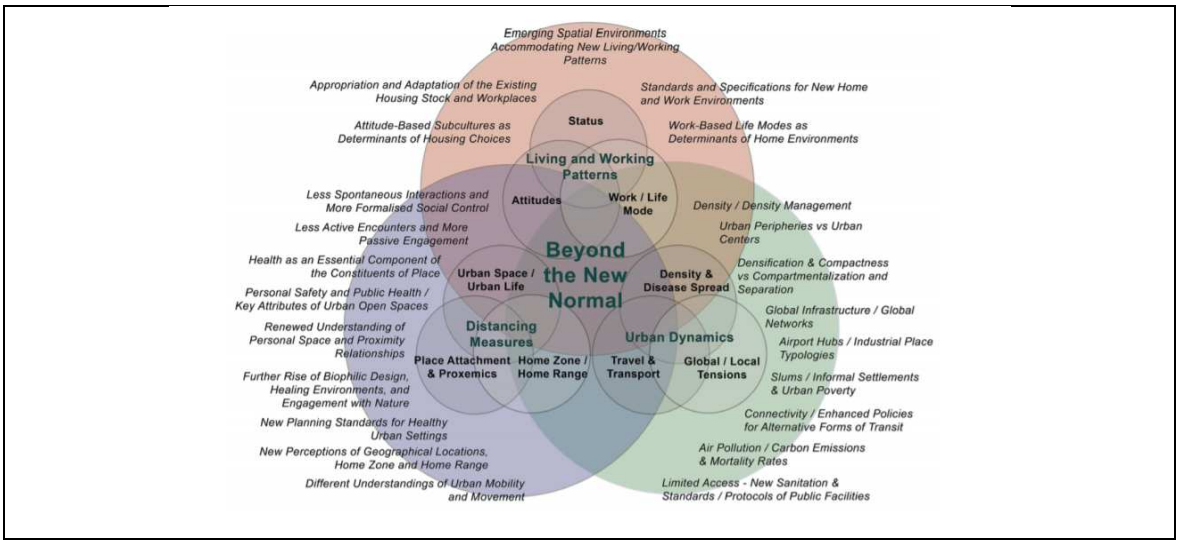


Figure 11:"Post Pandemic Urban and Socio-Spatial Implications and Potential Areas Impacting Future Education, Research and Practice of Architecture and Urban Designing and Planning." Salama, A. (2020) [24].

The online meeting "*Cities' Responses to Covid-19" focused on learning from early recovery, a more resilient future to "contribute to THE UNESCO's comprehensive transversal approach to the implementation of the 2030 Agenda for Sustainable Development in urban contexts and provide support to urban actors and decision-makers in mitigating the impact of COVID-19 and reflecting on the future of cities*" [25].

Adaptability and innovation demonstrated by many cities during the pandemic with exploration of urban development policies and strategies to build sustainable and resilient cities. Many cities have started easing measures for early recovery and adapted these measures to local needs. They aimed to resume activities, with restrictions and new adaptive measures [25].

"*Cities are redefining their identity and priorities. It will consider how cities can rethink their urban policies to strengthen their risk preparedness and response capacity, and become more resilient by making cities smarter, greener, more inclusive and resilient*" [26].

FUNDAMENTAL PARAMETERS THAT CAN CHANGE IN CRUISE SHIP ENVIRONMENT AND CRUISE EXPERIENCE

Berti (2020) dıscusses five ways the passenger experıence may change after the covıd-19 pandemıc. These are classified as health screenings and medical requırements before and during embarkation; enhanced hygiene procedures; the end of buffets; reducing capacıty at public venues; repurposing spaces for medical facilities and fewer rooms. These chancings have some spatial responses. Therefore cruise ship environment is needed to be put under review. According to Berti's (2020) projection, Because of enhanced hygiene procedures the area for water fountains and sanitizing stations must be placed in public spaces planned. Higher cleaning temperatures and the latest disinfecting products. Water fountains and sanitizing stations. With the possible ending of buffets and will change the dining areas plan scheme. Reducing capacity at public venues changes the entertaınment experience with new limitations for encouraging social distance. The theatres, cinemas, clubs and many other indoor spaces needs to be rearranged. Repurposing spaces with expanded medical facilities reserving more room for doctors and nurses and fewer rooms can be suggested. Also the plan scheme for the medical areas and public spaces must be well organized with both interlinked and separated from each other. some cabins might be kept vacant in case of an emergency. [27]

The fundamental parameters can be classified as: hygiene, material selection (appropriate for high cleaning regime and healthy), coordinated interior design with mechanical/electrical plumbing and (HVAC upgrades) and space planning approaches with additional functions and to provide social distance and lesser encountering (master plan scheme, circulation, public spaces), flexibility (for expanding areas or repurposing with adoptive manner). According to these parameters, there can be potential changes.

HYGIENE AND MATERIAL SELECTION:

In this post-COVID-19 World, smooth surface products and durable materials that can be selected for cleaning regime materials that difficult to sanitize must be avoided. Less porous materials and antibacterial material must be selected.

COORDINATED INTERIOR DESIGN WITH MECHANICAL / ELECTRICAL PLUMBING AND HVAC UPGRADES:

It is important to coordinate interior design with Mechanical / Electrical Plumbing engineers. Increased demand for certain plumbing fixtures and HVAC upgrades such as the following: Sinks may no longer be limited to bathrooms and kitchens, additional handwashing stations throughout cruise ship environment. More frequent air changes within a space would help to keep the circulating air fresh and healthier [28].

Figure 11: Royal Caribbean Quantum of the Seas implemented handwashing sinks outside of buffets. [28]

SPACE PLANNING:

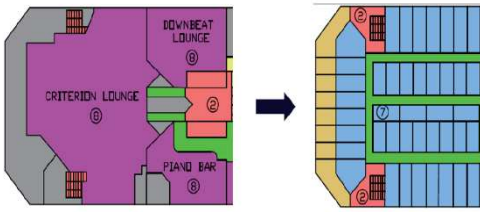
A large amount of space is brought together in master plan configurations. When the spaces are brought together, it is necessary to position the crowd in the space and to minimize the encounters of the crowd. Therefore, various scenarios are needed for public spaces, especially decks, dining areas, clubs and

performance areas. Plan scheme revision for some new functions and tools (quarentine rooms medical areas, extra wash basins ppe too) and bigger areas in accordance to the social distance.

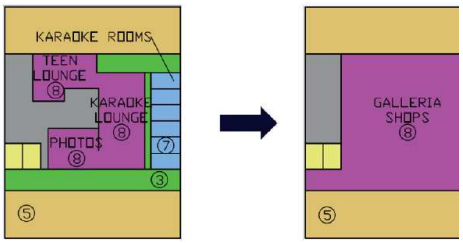
Sale and Zignego (2019) [29] asserted two different approaches for the future cruise ship: Firstly, they mention to divide cruise ships into neighborhoods where each passenger can easily recognize and feel comfortable on the cruise ship and designing cruise ship spaces like streets, squares and common areas in the city. Secondly, they mentioned thabout e new deck orientation in some cruise ships, which has a second focus on some new cruise ships with a different distribution and the presence of bars and restaurants on the sides of the ship. The second way also solves the lack of relationship with enclosed and center oriented deck. These two approach might help to divide the crowd and provide social distance by redirecting the circulation.

Figure 12,13: [29], [30], [31], Costa Fascinosa, Sun Deck left, MSC seaview—bridge deck right

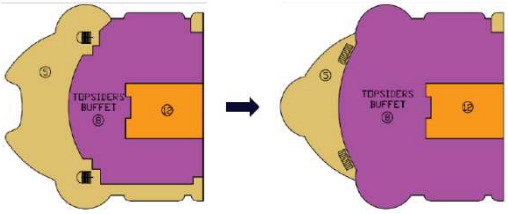
For Post covid cruise ship interior conversion cases can be a solution for altering plan schemes or repurposing existed spaces for new spatial scenarios. Having more bigger public spaces for providing social distance and removing interior cabinets due to lack of natural light and window must be new possibilities.



Lounge conversion into a cabin area, Carnival Sunshine



Public space conversion into a more functional space, Norwegian Star



Buffet restaurant conversion aimed at increasing its capacity, *Disney Magic*

Table 3: Justin Champion (2014) [32] cruise ship conversion cases

Şengül 2004 [33] compared three different ships from 1940-1960-2000 time periods and stated that the functions had been constructed that will bring profit on the upper deck. However, in the example of 1940, cabins accommodate sports areas and common areas, and in the 1960s, they were replaced by common areas. While passenger rooms with smaller middle yards but receiving natural light were designed in the 1960s, by the 2000s, the cabins were illuminated with medium size but artificial lighting. However, this situation can't be achieved sufficiently due to the desire to increase passenger capacity. Because of the lesser capacity of ships and considering well being of cruise ship passenger, It is possible to have different plan schemes which are similar to the previous versions with new technologies and new ideas. Besides smart design approaches will change space planning with sensors and automatic openings will provide touchless cruise experience and lesser interaction

FLEXIBILITY

Flexibility will be a key parameter in future planning and programming. One of the measures to be taken for advantage may be that some parts are mobile and the areas can be separated when necessary. Resilient design strategies must be considered for future of cruise ship environment.

CONCLUSION

By reviewing the developments in the pandemic process's increasingly renewed focus on healthy environments, it is thought that a change in the interior design of cruise ships to overcome future virus attacks will positively increase trust, health and preference in tourism after the pandemic. Therefore, the fields of architecture and tourism should work in coordination with each other. It may be useful to evaluate the needs of cruise tourism and architectural experiences in terrestrial architecture on the same platform. It is thought to be an opportunity to reconsider the cruise ship design situations that developed after the pandemic. Rethinking cruise ship interiors in light of COVID-19 could result in positive covid-19 design impacts and positive outcomes for interiors and remain permanently. Existing ships can be adapted to the new normal Decisions regarding the pandemic that can be made in the first stages of the design of the ships to be newly designed. Many of the short-term changes will be replaced with permanent, well-designed solutions in the near future.

Based on the lessons learned from this crisis, interior approaches projections towards healthier, greener, resilient, smarter and sustainable visions for the overall health and well-being of the user. In addition, conventional plan types may change. Some of the current restrictions will go away entirely as the risk subsides. Many areas for reconsidering and redesigning processes require further multidisciplinary studies with scrutinized multilayers for cruise ship interior.

While large-scale studies have been carried out on the operation, cost and engineering aspects of cruise ships, the contribution of design and architecture to cruise ship design has started to increase with interdisciplinary courses with Architecture and Naval Architecture and Marine Engineering in undergraduate departments of universities, Cruise ship and yacht design master's programs (FIU Cruise Ship and Super Yacht (CSSY) program), Developing multidisciplinary training programs and adding "cruise ship architecture" courses (Aalto University School of Engineering Cruise and Ferry Experience module), user experience and centered studies [34], [35], [36], expo on cruise ship interiors (Cruise Ship Interiors Expo), Cruise interior competitions, maritime-related symposiums and conferences (RINA, International Marine Design Conference, International Symposium on Marine Design).

Besides, with the Covid pandemic, the interior design of cruise ships will be more crucial for the cruise ship industry. In the post covid world, these collaborative works will be enhanced to provide healthier spaces not only for the covid 19 but also for other disease that might be seen in the future.

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"REINVENTING THE RIVER SEINE" AND NEW INNOVATIVE PROJECTS AROUND RIVER BOAT DESIGN

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ABSTRACT

Through a short introduction to the history of French waterway, we propose to explain how barges and boats became an alternative way of living across France, and how this evolved into a contest to reinvent floating architecture on the river for the 21st century. New political institutions were created around the governance of ports and rivers allowing for the creation of calls for projects "reinventing the river Seine." We will explore through case studies the transformation of 19th century's industrial use of the boats and river into innovative house space living.

If, for a long period, waterways and rivers were primarily where merchandising activities took place, living on the river eventually became a new standard for urban development. Over time, boat technology managed to change the French landscape, establishing new standards for management by waterway institutions in France (VNF, *Voies Navigeables de France* and HAROPA Ports, Havre Rouen Paris). In 2016 HAROPA held the first architectural competition "Reinventing the Seine" and launched 41 sites for the strategical transformation of the territory of river Seine by 2030.

This competition offers the opportunity to develop the territory and explore new ways of designing floating river structures. The water environment creates dynamic and movable living space with new opportunities in energy consumption. We will explore one new project that produced novel technological solutions using water in floating architecture.

Key Words: Boat design, Floating Architecture, Waterways, Innovation, Reinvent the Seine Competitions

INTRODUCTION

The history of the standardization of the territory around the Seine dates back to the Middle Ages and is marked by technological and urban exchange born of the river-/boat relationship.

If, for a long period, waterways and rivers were primarily where merchandising activities took place, living on the river eventually became a new standard for urban development. Over time, boat technology managed to change the French landscape, establishing new standards for management by waterway institutions in France (VNF, *Voies Navigeables de France* and HAROPA Ports, Havre Rouen Paris).

In 2016 HAROPA held the first architectural competition "Reinventing the Seine" and launched 41 sites for the strategical transformation of the territory of river Seine by 2030. This competition offers the opportunity to develop the territory and explore new ways of designing floating river structures. The water environment creates dynamic and movable living space with new opportunities in energy consumption.

Using scientific historical research methods, we can bring out the peculiarities of the river and show the correlation between the architecture of the boats and the evolution of the legal framework governing the river. This study aims to explore the historical relationship between boats and urban territory in the French landscape. We will explore one project that emerged from initiatives of current government institutions offering new technological solutions for floating architecture.

1ST STANDARDIZATION OF THE TERRITORY AROUND RIVERS

It is impossible to dissociate the landscape of French rivers from the history of the boats that cross it, and in particular the specific model called a *péniche*. This term is not commonly used in English, although its etymological origin, according to the National Committee of Textual and Lexical Resources (CRTL) dates back to the Middle Ages and designates, in Italian, *pinaza*: a boat made of pinewood. This word crossed Europe to become *pinnace* in England, and finally *péniche* in France (source CRTL, CNRS, 2012). The pinnace barges that had populated the French landscape from antiquity, observed a development from the 14th and 15th centuries, mainly for merchandising transport.

These flat-bottomed boats are designed to adapt to their immediate environments and use human or animal traction along the rivers. This explains why, in 1415, Charles VI commanded the residents bordering the river Seine to leave a eight-meter-wide path, called the *chemin de halage*, and allowing two horses to stand side by side. (M. De Vilevault, 1763).

Figure 1. Galard G. (1830) Ascent of a boat hauled by with manpower on the Garonne - Archives municipality of Bordeaux.

Figure 2. Damée H. (19st century), *L'Escaut - Péniche halée - Chemin De Halage* - Valenciennes

Thus from the 15th century, paths can be found along rivers in the French landscape, bordered by poplar tree alleys, which also served for timber production.

We can see that first a royal, political institution sets up an urban policy to transform the landscape and requires private landowners to make land available for interests of the state. And, in fact, river control is an essential tool for state control. On one hand, it guarantees the supply of food and goods, and on the other hand, it guarantees the ability to guard state borders and control of the axes of communication that include rivers and canals. Water transportation is a key to power.

It is important to consider the architecture of the shores and the locks because it directly influences the architecture of the riverboats. During renaissance times, the water mastery became one of the priorities for Henri IV of France who aimed to conquer new territories (especially in North America), control them, and carry various forms of merchandising. For military and commercial purposes, Henri IV ordered the construction of channels to connect the river. The perimeter of the decree include the river itself and its riverbank. Facts that this wave of construction is great improvement but not enough because

all the rivers are not all connected. Another technical problem is the variation in water level for different rivers and bodies of water. Although locks had been used in the middle ages, engineers like Leonardo Da Vinci or Bertolo Da Silva developed locks with airlock doors. For this reason, Renaissance is also a turn in riverboat history. Locks becomes the tool for a real transportation economy.

The Duc de Sully, Grand master of artillery of France, built the first Canal Briare in the 16th century (the Briare canal took around 50 years to be built). It was named the *Canal à Bief de partage.* The Biaire Canal is extremely important because it's the first canal to cross a hill, the first lift of boat.

Figure 3. Blondeau (1909), Canal of Briare, Boat bridge, Postcard, Briare

The Orleans Canal, for example, links the Seine and therefore the capital of France to the Loire, and by extension the northern seas to the Atlantic Ocean. This political will to control the territory, which involves the development of the quays, continued in the 17th and 18th centuries. In the 17th century, following the first order dictated by King Charles VI 200 years earlier, Colbert, then minister of the King Louis XIV, set up a *right of way* in 1681, which extended not only to the coast of seaside but also along the shores.

We can observe a second form of standardization around the shape of the river, standardization still visible today.

But until the 18th century, the lock and water-channel were built in random dimensions. The width of locks were logically adapted to environmental constraints. This produced navigation logistics problems because, in fact, the upstream or downstream canals can be more or less wide, constraining the size of the boat, or requiring shuttle transports at specific sections. Goods must be unloaded from one barge and then loaded to another, based on lock size and canal depth. We can also note the financial and political aspect. Without organization, some locks are privately owned, others lack financing for maintenance, and there are such disparities that the idea emerges to set up, at the national level, an "inner navigation system," precursor of a river water management institution.

Engineer Becquey supports a organization plan using these words (Letter from Becquey to the French official prefects of August 12, 1819, translation by the author):

> *« … the difficulty and the cost of transport have so far not allowed us to use so generally this precious fuel [the waterway] that nature has so generously placed in almost every part of the territory of our neighbors»*

This plan will be at the origin of the unification of all French territory by the waterways from Dunkirk to Marseille, thus connecting the North Sea to the Mediterranean and contributing to the prosperity of the country.

Becquey sets up a template for standardizing canals with minimum dimensions of locks, draft, and mooring standards. The lock also becomes the relay point for towing and human or animal traction systems. Workers are paid per kilometer and take turns at the locks. Barges were cargo ships but also carried horses. We use the specific term of: barge-stables, *bateau-écurie*, which were still in use until the mid-1930s, when they were gradually replaced by the steamboat.

The boatmen, who had a semi-nomadic life with a local relay system, began to cover longer distances and transform the transport barges into real dwellings.

Following the Becquey Plan, Charles de Freycinet created the "Freycinet Plan," a vast standardization and renovation initiative launched by the Ministry of Transport that nationalized rail and river companies. Charles de Freycinet set up the freycinet template for the lock dimensions based of the most popular boat in that time, the Dutch *flamande* or *spits*.

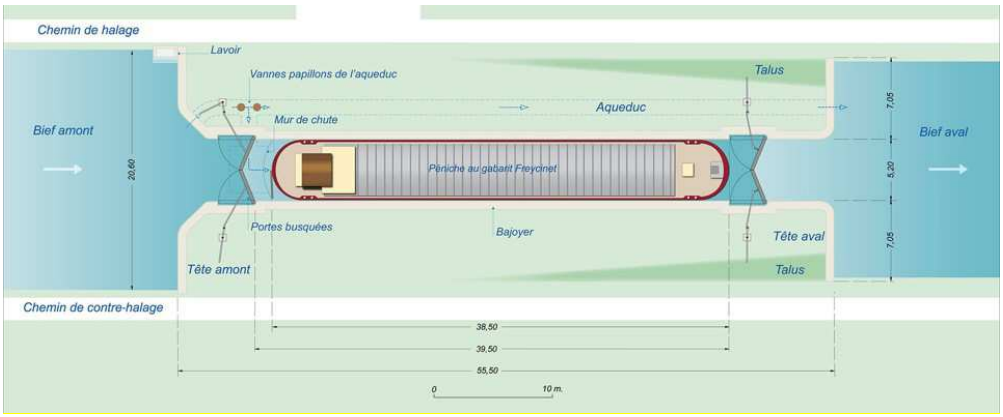

Figure 4. Morelière A. (2011), Freycinet Template, *Service Patrimoine et Inventaire*, région Bourgogne

The lock could hold a 38.5 x 5.05 meter, 2 meter waterline boat.

So, as the locks were standardized, new boats were constructed to the exact size of the lock to fill capacity for merchandise. By default, the Freycinet boat became the template.

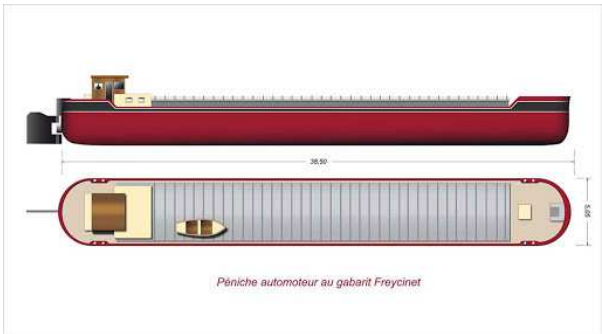

Figure 5. A.Morelière, *Service Patrimoine et Inventaire*, région Bourgogne, 2011

The Freycinet lock led to the Freycinet boat and at the beginning of the 19th century.

In the early 21st century, a new exchange between boats and rivers appears, because the Freycinet boat had become the standard for the urban planification around all the river Seine inside Paris.

BOAT STANDARDIZATION

Freycinet revolutionized the transport of goods by river, which reached its peak just before the establishment of railway lines and road transport.

Until the mid-1980s, the *péniche* served no other purpose than as a transport vessel for goods, not designed to be inhabited. We can consider the architecture of a barge as we might consider the architecture of tractor trailer. Aesthetic and architectural expectations do not apply to barges designed for moving goods, and which are themselves "movable" property (*bien meuble*).

But more and more, *péniche*s are becoming, in particular because of deindustrialization and the drop in river traffic, stationary rather than navigating vessels. The former mariners have transformed their *péniche*s into dwelling places and are gradually settling down. If we compare on *Geoportail* (data base of the ING, Institut Nationale Geographic) the sites occupied by barges between 1980 and today, we see that the occupancy rate has been multiplied by 10.

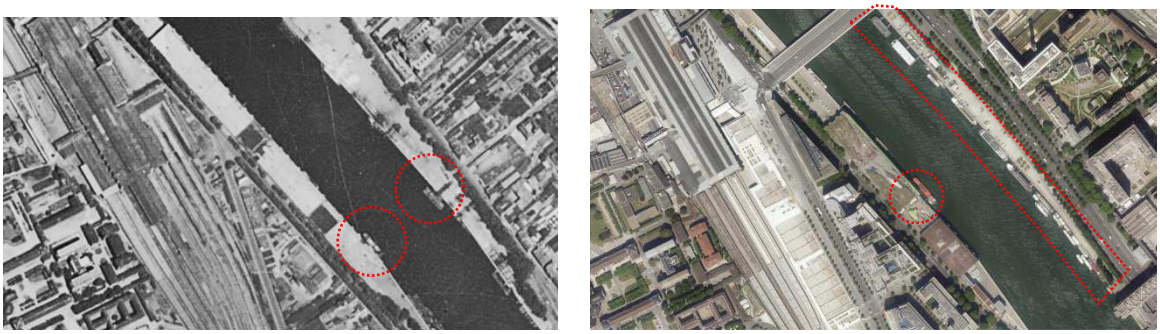

Figure 6. Air photo of Paris, 1950 and 2018, Quai Austerlitz and Bercy, Paris, Geoportail

In response to this movable property--that has become immovable, real-estate property--the Port of Paris, with the municipality of Paris, and a private or research institute called APUR (Atelier Parisien Urbanisme), decided to publish a book of specifications for the aesthetics and the enhancement of boats around the Seine. This book has no legal authority, but which acts as an authority since the renewal of parking rights is linked to this charter. Any transformation has to be approved by a boat heritage commission.

As we can see in the book (translated from French by the author) *Mise en valeur des berges de la Seine. Cahier des prescriptions architecturales et paysagères. (1999, p24-27)*:

> *2 - The architectural aspect*
> *The installation of houseboats on the Seine in Paris must contribute to the exceptional quality of the space. […]. Consequently, this document favors "traditional" boats for houseboats, in particular from the dominant model of the 38.50 m barge.*
>
> *Two scenarios can arise depending on the nature of the installations: - either the installation results from a creation adapted to the function, - or the installation results from the re-use of traditional old boats. Given an equal choice, the reuse of old river boats will be favored.*
>
> *a - The general composition and architecture*
> *New boats: pastiches systematically referring to sea boats and "exotic" or foreign naval architecture to European river types are prohibited. Reference to architectural types of urban construction real estate will be refused.*
>
> *Reuse of an old boat or a copy of a traditional river boat: unless a complete modification of an old structure, installations made from old constructions (or a copy) must respect the general appearance of the original boat and the type of river architecture that it represents.*

This document is based on the so-called dominant "model" by specifying, for example, that the length of the boats should be 38.5 meters. This refers, without directly naming it, to the exact length of a Freycinet barge. The shape, size or material refers to the Freycinet format, a precise aesthetic. The Freycinet template is for barges what the Haussmanien is for apartment buildings in Paris.

All the rules edicted obey to a double rule, uniformity for the commun housing and outstanding for specific program.

It favors a mutation rather than a new structure. These constraints, which may seem quite strict, lead to a real reflection of the new aesthetic on the Seine. We observe that for all of the projects on the Seine, retain the idea of the envelope and develop protean objects that we cut, glue, lengthen, shorten, widen, enhance, like a game of Lego.

Figure 7. Feldzer T.(2014), India Tango Boat, Site construction, Paris. Expansion, raising, enlargement, shortening and cutting of a Freycinet *péniche*

But despite the richness of visible transformations from freight boats into dwelling boats, the book of specifications limits uses and also limits commercial possibilities.

What are the consequences of a book of specifications that prohibits real estate aesthetics and considers the boat as a building, not movable. *Bien meuble* in opposition to *bien immeuble*. Since 2018, these properties are liable for property tax. Can we consider a boat in the same way as a building?

We can read behind these regulations the lack of consideration for the "floating" world, and therefore of the innovations that could emerge from this boat-river exchange that has been seen in history.

The historian Isabelle Backouche (Pr. Dr. at EHESS, Ecole des Hautes Etudes en Sciences Sociales, Paris) reminds us that the river Seine was a major place of commercial activity. In the 18th century, the river Seine was the densest urban space in the city of Paris. It even underlines a saturation of the river space. A political ambition after the 20th century was to reconquer this largely deurbanized and under exploitation space. In 2013, the Port of Paris joined forces with the Port of Rouen and Le Havre by creating a GIE Economic Interest Group, and which became HAROPA (Havre Rouen Paris). Through this alliance, HAROPA became one of the largest ports in the world, a unique territory between the mouth of the sea and Paris. The Seine became a territory.

HAROPA created, with the VNFs, town halls, and political administrative puzzle a committee to “reinvent the river Seine” whose objective is: “to bring out attractive projects, invent new ways of living, on and by the water, on the Paris axis - Rouen - Le Havre. Four common denominators are required: innovation in the relationship to water; the mix of uses; opening to the public; environmental and social excellence.” (Press kit, Presentation of the winners, Réinventer la Seine, 2017)

It is in this same political context of a desire to restore an economic and social place to the Seine that the *Dans le Sens de BARGE* project will emerge, which we will now see.

THE PROJECT *DANS LE SENS DE BARGE (DSB)*

DSB, in which I had the chance to participate, is a project of an “itinerant” art center on the Seine.

Like Yona Friedman, who created "the museum without a building" using steel hoops, a structure designed for and by the inhabitants and to accommodate cultural media, the DSB project intends to provide a cultural offer outside of a built environment.

Figure 8. Decavel J.B. (2014), Yona Friedman vigne museum Livio Felluga winery Italy.

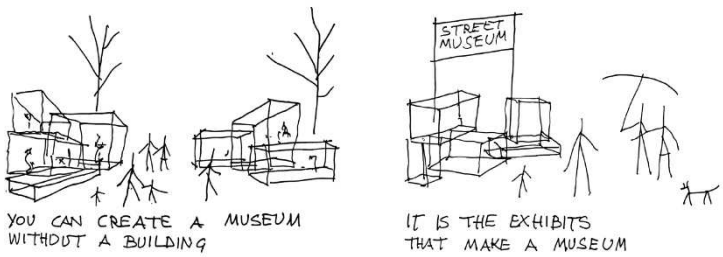

Figure 9. Yona Friedman (2012), Sketches of the museum without walls, CNEAI Centre National Edition Art Im

Consider this description from the DSB:

"DSB project is a Sequan organisation that offers original cultural mediations, artistic and scientific actions. It consists of two mobile boats equipped with "modules" that will serve as a "mobile art center" traveling along the seine. The DSB's mission is to support the development of the cultural life of the Seine basin using all the diversity of cultural and social contexts by means of river mobility between its territories. The aim of the project is to create an "itinerant" art center and to galvanize a territory in leak of cultural offer. (Source: press pack 2020, Dans le Sens de Barge, General presentation)

The project is structured around three components, the artistic and social component, the educational component, and the technical and architectural component. Its innovation and its specificity revolve around the combination of these three aspects.

The artistic aspect is foremost, because this center makes it possible to bring a cultural offer to areas lacking cultural offerings. A boat will deploy "modules" across the territory, like bees swarming the landscape.

If we observe an operating diagram, roaming allows one city, one museum, to dialogue with another. The itinerancy creates an exhibition in Le Havre, caries it to Rouen, enriches it in continuity in Ile-Saint-Denis. The boat works as a cultural swarming.

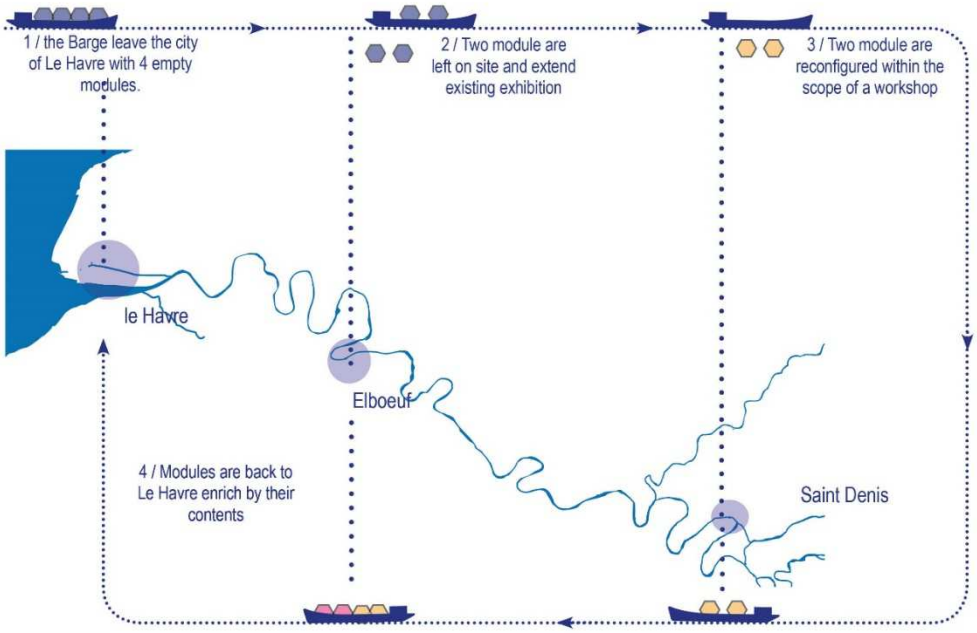

Figure 10. Feldzer T. (2017), swarming example of DSB project, Seine River

As of 2020, the architectural project is in the premilinary phase (*APD, Avant projet Définitif*), the artistic and educational project already began in 2016.

Figure11. Feldzer T. (2017), DSB visualization of deployment on the quay, Seine River

Figure 12. DSB (2020), Press kit presentation, assessment of DSB activities and exhibitions

Since 2017, the association has set up approximately ten projects, exhibitions, workshops, conferences and seminars. The fluvial roaming began with an existing barge on loan, which supported a first piece created by the artist Jean Baptiste Sauvage during the Normandy Impressionist Festival. The work directly refers to the techniques of confusion and diversion used during the First World War.

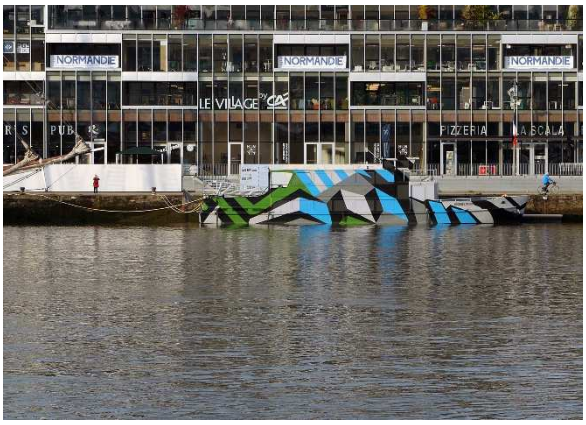

Figure 13. Sauvage JB (2019), Razzle Dazzle, Boat of DSB, Repaint by the artist Jean Baptiste Sauvage for the impressionist exhibition in Normandy

Figure 14. Wilkinson N. and Wadsworth E. (1919), Military boat using a razzle dazzle war technique to create confusion for the enemy.

Another artist who was associated from the start with the project, Katharina Grosse, imagined exhibition configuration scenarios.

Figure 15. Katharina Grosse (2020), Katharina Grosse and VG Bild-Kunst Bonn exhibition 2006, Taipei Fine Arts Museum, Taiwan

Figure 16. Feldzer T. (2017), Configuration of exhibition of DSB with Katharina Grosse, Rouen, River Seine

From the first architectural sketches, the association sought to create an architectural object as neutral as possible so that the boat could become a support for artists.

Educational and research component

Among the twenty people involved in the project, we can name more than 3 professors in schools of Art and Architecture. The educational component was from the start an inherent component of the project.

It made it possible to rethink the architectural project and to question it, to enrich the artistic activities carried by the association. We can cite, for example, the research projects which led to the first realization of the Razzle Dazzle in partnership with a dozen schools of art and architecture.

Figure 17. Sauvage J.B. (2019), ex-voto exhibition, work of the students from ESACM, Ecole Supérieure d'Art de Clermont Metropole, Rouen

Among the schools participating today in the Barge project, we can mention :

Ecole Nationale Supérieure des Arts de Cergy, ESAdHaR - Ecole Supérieure d'Art et Design Le Havre-Rouen,

ENSA - Ecole Nationale Supérieure d'Architecture de Normandie, ESAM de Caen-Cherbourg, Néoma Business School à Rouen, ENSP - Ecole Nationale Supérieure du Paysage de Versailles, ENSAPVS - Ecoles Nationale Supérieure d'Architecture de Paris Val-de-Seine.

These programs have led students to rethink, for example, the modules onboard the boat. A module was produced by the students of the ENSA. Other modules are being studied following a blueprint that has been produced within the team.

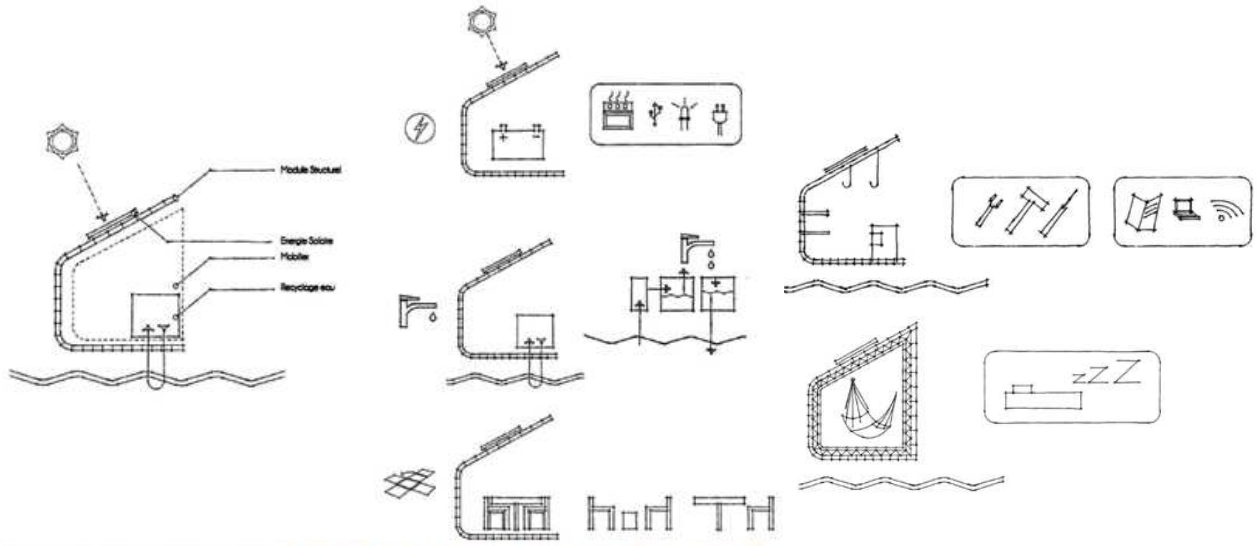

Figure 18. Feldzer T. (2019), module program for Architectural project DSB, Paris

Regarding the architectural aspect, as we have just seen, there is a navigation component as well as modules that are deployed on the quay. The project used an existing barge, and two other new barges are under construction. The modules have different forms. A first module was produced by the students of the Ecole Nationale Supérieure d'Architecture de Normandie (ENSA). Three other modules are being studied by a scenography firm called Metalobil, and other modules should emerge as the team of teachers and students participate in the project.

While the project takes several forms, certain architectural choices have delimited its outline. As one goal is to navigate the basin of the Seine, the format has to conform to the format of the locks of the Seine: 5 meters wide and less than 38 meters long.

In the boat design, there was a deliberate choice to remain neutral, without artefact, the steel structure being the only character expression, so that the artists could appropriate the space and turn it into a work of art, working the boat as an exhibition medium. Steel construction is also the most common on the basin of the Seine for the shipyards.

Concerning the on-board engineering, the idea is to take advantage of new technologies being installed on the Seine: In July 2020 HAROPA signed an agreement with the European Commission for the installation of 78 hydroelectic and electric terminals, which would be a bit like petrol stations. This would allow boats to switch from diesel to electric motors.

Among the engineering companies currently working on the DSB project, two are note worthy: Carwatt and Mincatec.

- Carwatt is a company specializing in the electrification of existing boats. Through the reuse of 2nd generation batteries, it contributes to a circular economy because it creates jobs that cannot be relocated.
- For a new hull, DBS is opting for Mincatec engineering, which specializes in a hybrid hydro-electric solution.

These new technologies cannot be profitable and efficient without a local relay and electricity production from the Seine. Again, VNF has signed agreements with innovative power generation technology companies like Hydroquest.

Hydroquest produces electricity from the flow. It uses hydrokinetic turbines with a very low environmental impact.

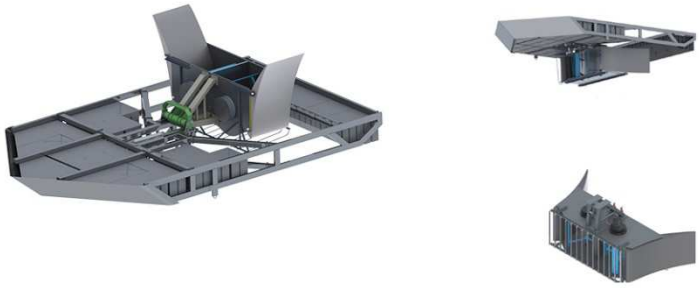

Figure 19. Hydroquest (2020) Hydraulic tidal turbine for Electric production

Hydroelectric power stations produced from the locks, many installations are under construction throughout France. We will retain the two main techniques currently use: the archimedean screw and the Kaplan type turbine.

The project, though water-based, is never completely land-based. We have seen that the boat's technology adapts to the technology imposed on and emerging from the river. So we're going to look for batteries storage and autonomy solutions for a few days before we can come and connect to the network.

There were over a dozen architects who worked on this project, and signing as an “author” no longer makes sense. It is the fruit of a cooperative work, which gives protean forms. The choice is to remain modular, a bit like Jean Prouvé did in his time, to be able to dismantle and reassemble the structure and adapt it as needed.

Working on a territory with flow, and not real estate property, has only been made possible with a voluntary political authority.

Figure 20. DSB (2018) Module realized by the students of ENSA, Ecole Nationale Supérieure d’Architecture de Normandie

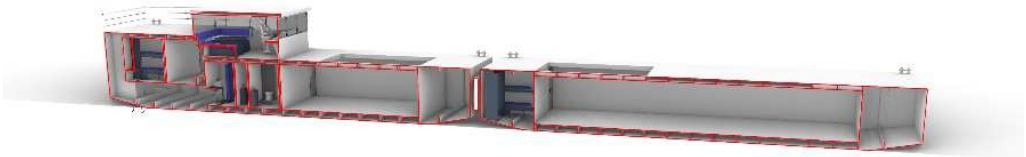

Figure 21. Archi-Delion (2020), premilinary outline of the DSB floating project

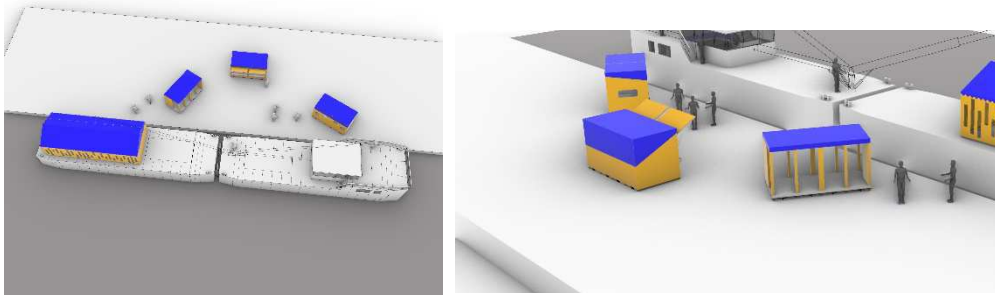

Figure 22. Archi-Delion and Metalobil (2020), premilinary outline of DSB floating project

CONCLUSION

First there was a desire to control the land, and a royal order left a right of way that permanently transformed the landscape along the banks of the rivers and canals.

We can trace a shift from a semi-private policy relayed to individuals (from the Middle Ages to the Renaissance), to a national policy which compels private companies to obey a standardization code under Becquey, and then, in the 19th century, to a plan of nationalization of the territory with Charles de Freycinet. This management created a standardization of canals, locks, and boats with the invention of the Freycinet template. The management of barges is still changing. Barges will travel longer and longer distances and become places of life in their own right. They are arousing renewed interest today.

Reunification policies in the territory made it possible to set up standards first at the level of the rivers and then for the boats themselves. Another round trip "boat-territory," this time takes the Freycinet barge as a reference for spatial planning in Paris.

Today we have decentralized the locks and privatized the management of ports, while advocating a form of standardization through the economic interest group (GIE) of HAROPA.

In the 19th century, the locks served energy relay points. *Péniche* are not offshore constructions. The technology of the boat adapts to the technology offered by the dock. As phones became smartphones, the design of floating architecture can be also seen as a network integrating energy bridge with existing infrastructures.

Reinventing the Seine has given new impetus to the transformation of the territory and, as we have seen, a project like DSB has made it possible to create a territorial link. It operates within social ecosystem. The architecture of this project is no longer seen as an object created at an instant, but rather seen as an accumulation of projects that interact in time and space. It's a protean object that works like a murmuration bird's movement. It brings a real reflection on what is the "movable" and "immovable" properties and how to rethink the interactions between navigable and floating architecture within the territory that it marks out.

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THE ROLE OF WATER AS A DESIGN ELEMENT: EFFECTS ON MOORISH ARCHITECTURE AND IT'S CROSS-BORDER STRUCTURES

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ABSTRACT

Since ancient times, water has an important role in the history of civilizations. Starting of agriculture, water, which is the primary criterion in the settlement of civilizations, will now have an important role for the development of civilizations, as well as the need to maintain the vital activities.

After vital activities are met, the role of water and its spatial function cut in. As a result of its relationship with visual and auditory senses, water begins to be an important element of spatial organization.

As well as water's importance for the contribution of human wellness, it has an important role in the religion's ceremonies and beliefs.

In the study while examining the importance of Moorish Architecture, it will be started from Morocco, which is the starting point of the movement, from the gardens to civil structures where the Moorish effects are seen. From the oldest to the newest; gardens, Menara Garden, Jardin-Garden- Majorelle under the influence of Cubism in Marrakech and riads where the general public live.

Moorish architecture's cross-border structure; the royal Alhambra Palace, locates in Granada, Spain is examined. Inside the Palace of the Lions, Patio de los Leones (Palace of the Lions) and Patio de la Acequia two of the most important section in terms of their garden and the relation of the water in Alhambra Palace in Granada.

In this study, the role attributed to water; from the impact of civilizations on settlement planning to as a design element in the architectural field will be analyzing.

Key Words: Mudejar Architecture, Moorish Architecture, Role of Water, Morocco, Spain

INTRODUCTION

The only known planet in the solar system that has water inside is the Earth – Nowadays water has been found also on the surface of the Moon- The history of water, which is one of the indispensable requirements for life to survive, is dated back as far as 4.5 billion years ago (Sleep, N. H.; Zahnle, K.; Neuhoff, P. S. 2001).

Water is quite crucial in the formation of life, is also of great importance in all civilizations that existed in the past. Civilizations settled along rivers have developed themselves in agriculture and stockbreeding, so the population has increased in a healthy way.

When analyzed in terms of religious beliefs, the value of water for the beginning and continuity of human life is similarly high. In all sects of Christian religion, for instance, holy water that has been blessed by a member of the priesthood and is used in baptism in temples, houses, and devotional posts. Water has been used by religions as a natural symbol of purification, as a way of eliminating uncleanness, either ceremonial or spiritual or both (Britannica, 2020).

In Hinduism, sacred water is consumed in the temple, after worshiping ceremonies to pray, pay homage to one or more gods called *Puja*, or to celebrate an event spiritually in the Holy Ganges River. It is believed that the life cycle will be completed when this water is drunk. Also, there is a belief that the river cannot be contaminated (Sheriff, 2018).

According to Islam, the importance of water is clearly stated in the verses of the Qur'an. Before God created heaven and the world, it passes as follows: "And it is He who created the heavens and the earth in six days, and his Throne was upon water." By using water, which also symbolizes cleanliness for Muslims, the body is purified of earthly dirt before worshiping. Also, the most repeated phase in Quran is “gardens underneath which rivers flow” to describe the heaven (Qur’an,11:7; Latiff, Yunus, & Mydin, 2016, s. 62).

There are many metaphors in which water is used to describe paradise in the verses of the Qur'an.

When we want to build a connection between water and architecture, we need to link architectural decision’s background with religious beliefs. Since religion is the main effect on design arrangement details back in time.

MOORISH ARCHITECTURE

Moorish architecture is named after the Moors, the people of North Africa who, beginning in the 700s, invaded the Iberian Peninsula and several islands in the Western Mediterranean. It is a variant of the architecture of Islam. It grew from the Middle East to the Maghreb, an area which included parts of North Africa and Spain, as a community of people of Islamic faith spread. The Moors invaded parts of southern Europe during their powerful time and even moved to parts of the Western Mediterranean, including the Western Mediterranean.

Roughly from the 8th to the 16th century, the Moors were in control. Some of the most prominent examples of Moorish architecture can be found in Spain, with most built between the beginning of the 13th century and the end of the 16th century. During that period many structures have been designed, including mosques, non-religious structures, such as parks, fortresses, residential buildings and fountains with spectacular interior features, elaborate surface decorations and open spaces full of double arches of contrasting dark and light stone.

In the architecture of the Moors, fountains and pools used in the middle of buildings such as palaces and madrasahs, and different types of trees and flowers used together with fountains and pools in the gardens are expressed as the depiction of the heaven on earth depicted in the Quran (Lehrman, 1980).

The region that includes the natural environment surrounding the pool and fountains and the area they host was created to bless the soul by filling it with faith and happiness (Latiff, Yunus, & Mydin, 2016).

Since it triggers calmness and serenity in the human soul, it is known that water has been used in the treatment of psychological disorders since the 13th century in Anatolia in "hospitals" established together with music. The sound and reflection of the water used in the hospitals as it drips, as well as listening to the sound of the flowing water, are examples of how the water is used as a continuous cycle to bring vitality and life to the environment.

EXAMPLES FROM MOORISH ARCHITECTURES LOCATES IN NORTHERN AFRICA

Menara Botanical Garden

The history of the Menara Botanical Garden, located on the slopes of the Atlas Mountains, Marrakech dates back to the 12th century. Built in the 16th century, the pavilion was used as a summer house in the 19th century. The artificial lake and botanical garden in front of the building are surrounded by olive groves and palm trees. The purpose of the artificial lake is to accumulate storage water for irrigation of the natural cover in the environment. It covered by UNESCO World Heritage List in 1985 with it’s 1st, 2nd, 4th and 5th criterias.

Figure 1. Menara Garden (location-marrakech.info)

In this ancient water transportation system called Qanat -Khettaras-, the water can be extracted from the water source to the desired area and can be transported to the desired area thanks to the shaft channels that are opened vertically from the water source to the surface.

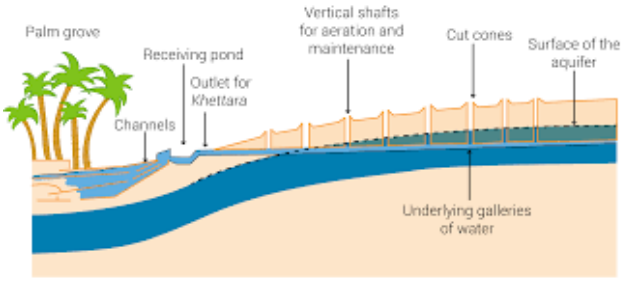

Figure 2. Khettaras System (water.fanack.com)

Majorelle Garden

Not only for the irrigation purposes but also for the visual concerns water has a crucial meaning in Moorish Architecture. Majorelle Garden, construction was started by Jacques Majorelle in 1923 and was used by the artist as a residence. The pool, which is the central element of the garden of the building, and the botanical garden, which covers an area of 2.5 acres surrounding it, are a building example of paradise that has an important place in traditional Moorish architecture.

Figure 3. Majorelle Garden (Simsek's Personal Archive, 2019)

Riad

Except than, palaces, monuments, structures for public services and religious architectures, for Riads; is the type of house used by the people of the region as a residence. The terraces of these buildings, usually two or three floors, built of mud brick or brick, where several families live together, have a flat roof. Mostly, there is a patio in the middle. In the area where privacy is important, there is sometimes a fountain or a pool in the patio inside the riad, depending on the size of the riad.


Figure 4; 5. Examples of Riad with Fountain and Pool (telegraph.co.uk)

CROSS-BORDER EXAMPLE OF MOORISH ARCHITECTURE: ALHAMBRA

The most complete and preserved form of Moorish architecture, which has an important effect on Spanish Modernism architecture in terms of its ornaments, stuccos, architectural form and shaping of openings; built as a small castle in 889 and transformed into its present form in 1333 when the Sultan of Granada, Yusuf the First, transformed the building into a palace, Granada can be observed in the Alhambra Palace.

Since it is forbidden to use human and animal figures in Islamic art, square, zigzag, labyrinth shapes, eight and six-armed stars, geometric-shaped ornaments and motifs that are integrated into one another with Islamic art and architecture, the basic form derived from the circle. It was frequently used in its decoration. The decoration is unique in terms of the endless reproducibility of geometric forms and the relationship between them and is a defining feature of Moorish art.

Figure 6. Alhambra Palace (Yağmur Şimşek'in Kişisel Arşivinden, Simsek's Personal Archive, 2018)

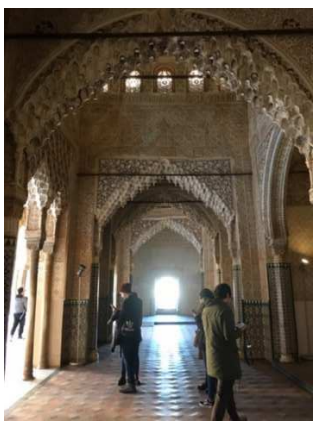
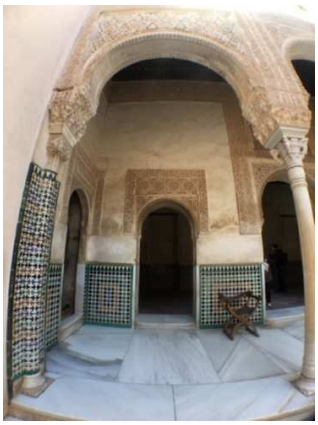


Figure 7; 8. Alhambra Palace. On the left is the reception hall Arch and Columns. Right, Myrtle Patio (Yağmur Şimşek'in Kişisel Arşivinden, Simsek's Personal Archive, 2018)

The geometric form of the stucco that completely covers the walls of the palace in some places, "There is no Divinity but God" and the style of the calligraphy carvings written in verses from the Qur'an were named by Grabar as 'horror vacui' - fear of emptiness- (Kılıçoğlu & Kara Pilehvarian, 2017, s. 3).

Figure 9. Door Adorned With "There Is No Divinity But God" (Yağmur Şimşek'in Kişisel Arşivinden, Simsek's Personal Archive, 2018)

No decorations other than ceramic coating and stucco were used on the facades. The elaborate patterns and carvings of the arches used in the reception hall are under the influence of Gothic architecture. As it can be seen from these examples, religious concerns are on a very high level when deciding design principles.

Figure 10. Geometric Pattern Façade Decorations of the Alhambra, Comares Palace (Yağmur Şimşek'in Kişisel Arşivinden, Simsek's Personal Archive, 2018)

The horseshoe arch with a rounded top that bends ever-so-slightly inward on the foot, is one of the most distinctive features of Moorish architecture. It looks like a horseshoe, as the name suggests.

A distinct-looking, decoratively carved, honeycombed vault called 'murqarnas', which can be found on the ceilings of alcoves, on the inner curving portions of arches and in other places, is another architectural feature that can be found in Moorish structures. Wide domed ceilings were also used in many of them.

Palace of the Lions and its patio, one of the crucial part in terms of its characteristic structure of the Alhambra Palace, was built in the 14th century and is the oldest garden in Western Europe. In the middle of the patio, there is a twelve-sided diagonal marble fountain that was carried by the lion sculptures. Four waterways, where this sculpture group is determined as the intersection point, run into the palace on the north, south, east and west facades. When these waterways, which go underground from time to time, reach the other gardens in the palace, they come back to the surface. This water was brought into the palace from the Rio -River- Darro through canal systems. The river has also been used as the source of the irrigation system. A pump and hydraulic system, which can be considered as the advanced version of the khettaras used in the Menera garden for water transfer, has been developed.

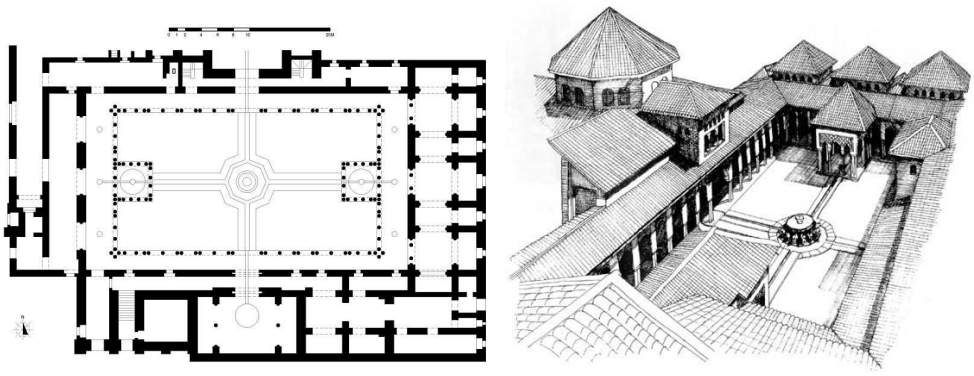

Figure 11. Palace of the Lions Plan and Perspective (arts.ucdavis.edu)

In the Patio de la Acequia located in Generalife, outside the palace structure, there is a landscape arrangement in the patio with a pool extending in the middle of the plan and its edge. In order to prevent the wind in order to reduce the dry and hot effect of the Mediterranean climate, the south wall was built as a hollow arch arrangement. Accordingly, it can be thought that it is an example of the paradise depiction dating back to the present day, with the arrangement of the water lying in the middle and the green area on the sides (Latiff, Yunus, & Mydin, 2016, s. 66, 67).

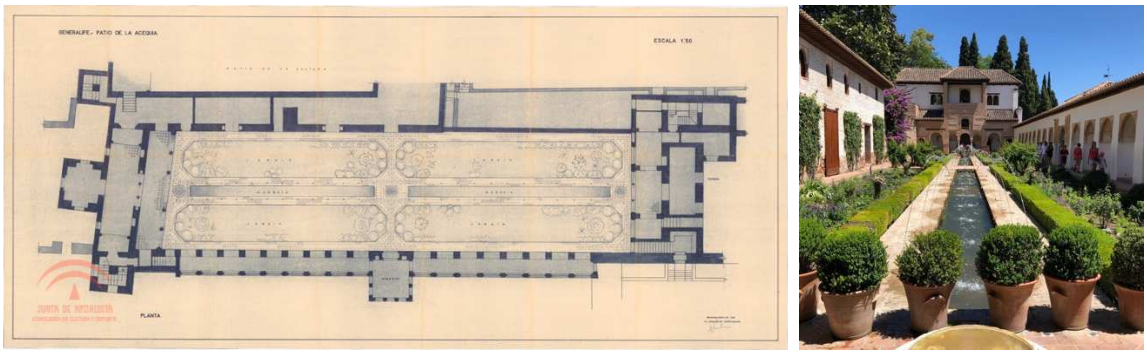

Figure 12. Patio de la Acequia Plan and Picture of the Patio (alhambra-patronato.es)

Figure 13. Outside Walls of the Patio de la Acequia (Google Maps)

CONCLUSION

As it is known, the sacred meaning expressed by water in many religious beliefs has also a great place in Islam. The most important aim when designing the buildings is to glorify the religion one belongs to. Since portraying human and animal images is forbidden in the Qur'an, this representation has only been attempted by animating the sacred places mentioned in metaphorical descriptions in the Qur'an. Islamic civilizations that developed in geometric and calligraphic ornaments found the way to use the verses of the Qur'an as decorations in their structures.

For this reason, dynasties have started a race to build the most gigantic, unique and the most completed monuments of their era, to represent their values and heraldries.

The palaces and gardens, which are regarded as the representations of power of the empires, are arranged on the basis of the depictions of the paradise in the holy book. As it is necessary to develop the technological infrastructure while making this arrangement, civilizations have also developed themselves in structuring. In addition to the impressive appearance of the pools,

fountains surrounded with gardens where the paradise is depicted, the environment has been provided for the cultivation of many different endemic plant and tree species, and the architecture has developed itself due to the characteristic elements of the style known as Moorish-Mudejar-Architecture.

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WATER AS DETERMINAT OF DESIGN IN BUILDINGS FROM OTTOMAN TO CONTEMPORARY BOSINA,

The case study of Stolac

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ABSTRACT

Water as an element of public and private buildings design is evident through history. The way water was brought to the buildings as well as how it was distributed around the buildings has had great effect on the mere design and use of the same. The focus of this paper is water presented as a feature as well as a main function in the design of public and private buildings and gardens from the Ottoman period (15th century) to present day Bosnia.

This paper aims to examine the relationship between the water and the functionality, materiality, form and sensory attributes of the abodes, through the two very important and symbolic buildings as examples of their time; particularly traditional housing complex of Begovina and modern expression of hotel Begovina both located in Stolac are to be discussed. The focus of the research is on understanding the coherence/connection among the sensory experiences with the focal point on aesthetics as well as the practical function of the influence of water. This will bring us closer in understanding the rationale behind the seemingly spontaneous arrangement of the residential complex from the 19th century and thoroughly thought of design of the 20th century, both having design based on the unbreakable connection to water.

Key words: design, water, Ottoman time, architectural design.

INTRODUCTION

Water is an important element for sustaining life. It is one of four Classical elements typically referd to the concepts of earth, water, air, fire which were proposed to explain the nature and complexity of all matter. They are intertwined with the human existence and with the build world. Architecture and water are habitually related one to the other as water is the origin of life. This can be seen on many levels. Through the history many civilizations have used it as tools to establish their settlements or to glorify their buildings. Contemporary architecture uses it for it aesthetics inside as well as outside the buildings.

Bosnia is a country that has abundance of water and this has been recognised as an advantage. Thus affluence of water sources was used in Roman times not only for basic usage but also for constructing villas with pools and baths etc. The medieval period of Bosnian Kingdom lasted until the Ottomans came to rule in 15th century. During this time fortresses were built overlooking rivers. Structures, such as water wells and cisterns were built to support water supply while remains of the group of mills over river created certain cultural landscape of its own time. Ottomans however brought sophisticated culture of the Empire followed by major acceptance of the new religion and new way of living; for the first time urban development took place in Bosnia. Most of the settlements emerged along the river, and water was much appreciated natural element. It was used to build not only structures in which the function was heavily depending on water such as public faucets, sebills, hammams etc. but it also was foundation in a process of beautification. Water became important feature in buildings as an emphasised aspect of quality of life in housing residential compounds.

Local context, which is a result of integrated tangible and intangible elements, was transmitted to the present time. To some extent, the value of the traditional architecture was already recognised as important during Austro Hungarian period. With 20th century this recognition of the local tradition grew and become stimulus for much of the cultural values that have been evaluated and preserved. Moreover, the tradition will become a base of new design, identified as values to be interwoven into new buildings.

This paper focuses on how the presence of water – either as a feature or a function – enriches the design of buildings, and how this relationship is perceived through sensory human experience. Parallel inquiry between the two selected buildings belonging to two different architectural periods and styles that share the same locality will be examined as both have water as their determinant. The buildings are analysed through the aspects of architectural functionality, materiality, form, scale and sensory qualities. The process will bring us closer to understanding the relative importance of water to its context, how it has affected the content and functionality of the design/ building and how it has satisfied it users.

Both of the studied buildings are located in Stolac, a town in south part of Bosnia that is due to the large number of courtyards and immersion in greenery and flowers a true "garden city". The site/town is best described by Bernik (2002), as area where life pulsates between the East the West and the Mediterranean, between Catholic, Islamic and the Orthodox, on the banks of river Bregava. In addition to greenery, Stolac is also characterized by its connection to the river, and a life that takes place right next to the water. Begovina is architectural housing complex built under the influence of Ottoman residential style in period between 1840 to 1860 (Hasandedic,1990). Although based on Ottoman tradition fetched form Central Anatolia the style developed under local influences making it a valuable example of traditional architecture of Bosnia and Herzegovina.

As an answer to the 20th century building design, with strong roots in the local context and based on traditional values of the locality that it was built on, through the use of the materials, form and scale, Hotel Bregava designed by Prof Ugljen will serve as an example to be evaluated thru the already established parameters immanence with water.

RELATION OF WATER AND BUILDING DESIGN

Architecture emerges as a result of different aspects which interwoven through skilful design creates a unique architectural experience. Works of architectures are meant to be used and to accommodate functions. Besides the most easily noticeable, spatial functionality there is technical, economic, environmental and symbolic architectural function as well. The importance of the functionality was first mentioned by Vitruvius (1997) in his *De architectura* in which he famously notes the "triad" of characteristics associated with architecture – *utilitas, firmitas and venustas* (utility, strength and beauty) – the aesthetic principles that have guided architects for centuries. Function therefore is a key determinant that actually evokes specific form and materiality. Function is sometimes emphasised by specific elements or the space arrangement. Thus, Water can play a significant role in functionality of the building or landscaping. Some of the most beautiful manifestations of water usage include irrigation, fountains, indoor and outdoor pools, etc. in which the water becomes determinant of the functionality. Furthermore, access to water has been one of the most important factors in the formation of cities and buildings.

As architecture outlives humanity, materials play important part leaving lengthily impact with their robustness and longevity. Adequate choice of materials mostly depend on geographical area or historical and cultural context as well as political influences. The right choice of materials for a particular design can contribute towards a successful interpretation of the initial idea. AS Schröpfer (2016) suggests, they serve as language that articulates architectural vision or that it serves to make architecture tangible. Materials used in architecture hold both technological and aesthetic values. Consciousness about materials is, therefore, considered a requirement for architects and using water as a determinant in building design brings this knowledge a step higher.

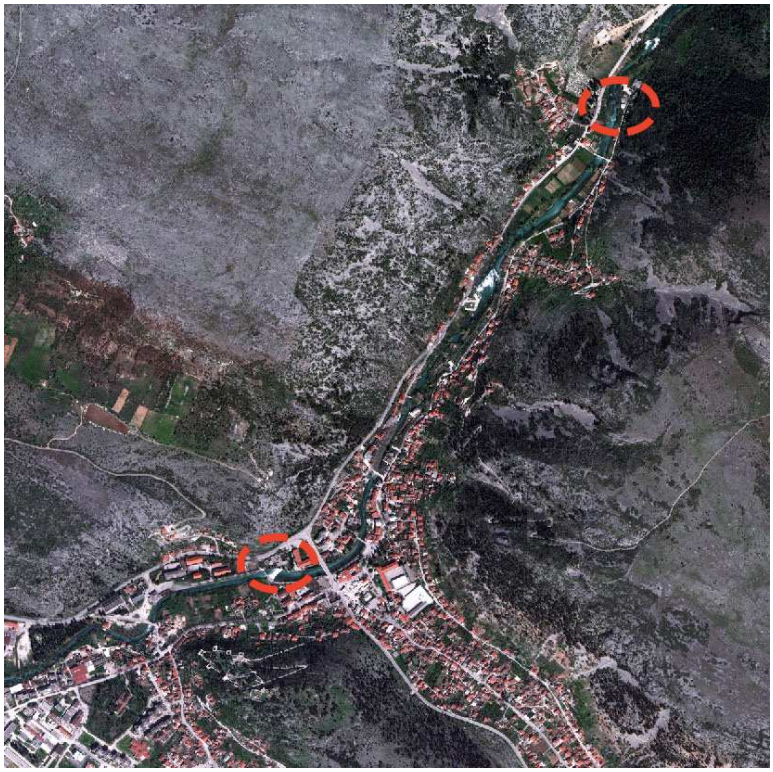
When we talk of a form in architecture, we not only refer to the building shape but to a collective group of elements that reflect its size, scale, colour texture and volume; we refer to all of the visual properties of an object. Form has explicit relationship to space as it directly influences exterior and interior spaces. With this the form becomes the most obvious expression of how one perceives work of architecture. The way a building looks represents its formal language and architects approach in designing buildings form; how it (the form) shapes space is very personal and individual experience. Form has its opposite in a space and together they constitute primary elements of the building and both are determinants in giving shape and scale in the process of designing. Liaison of the form to its contexts and other buildings creates an important aspect of this relationship and water can play a significant role in it.

Interaction of those elements brings the aesthetics effect and overall quality of design. The concept of aesthetics is to enable recognition and appreciation of the factors that have a role in understanding any beautiful object it being painting, sculpture or architecture. The factors that play a role in this determination are somehow specific for each of the artistic fields and in architecture the priority is to understand functionality, materiality, form, scale and unique experience of sensory qualities. Through history, in the evolution of cities, aesthetic qualities of natural topography, including the water environment played important part in enhancing the urban status. The same can be said for the enhancement of architectural enclosed and open, garden like, spaces. To the day, the body of water brings great aesthetical value to the building.

However one of the most important elements is a context in which the building sits. The immediate context has emerged as an output from the relation of built environment and nature with emphasis on functionality. While the built environment in the past was much more dependent on the natural condition of the site and on the availability of the building materials, this also lead to the creation of the spaces which are able to respond to the natural condition, beside utilising the function of the building.

CASE STUDIES

The two selected cases present evidence of the two different historic periods. Housing complex Begovina is an example of traditional vernacular architecture and Hotel Bregava as an architectural expression of 20th century.



Map 1. Location of Begovina housing complex and Hotel Bregava in Stolac

BEGOVINA HOUSING COMPLEX

The residential complexes of Stolac, among which Begovina (Figure 1.) stands out, were built along the river, with houses towering over its banks. In the greenery of the courtyards, white cubes stand out - the walls of houses with slightly pitched roofs and wooden projection are reflected in the river.

Begovina is located on the east side of the river Bregava and is one of the best examples of this type of architectural complex including loggings and large gardens located on the outskirts of the town creating a independent complex separated from the

town. The complex begins with Ćuprija in Begovina, which is the youngest of three larger stone bridges in Stolac. The parish was built at the end of the 18th or the beginning of the 19th century (Commission,2014).

The concept of Begovina is based on space shared between the four brothers who had the residential complex built. It also respects the natural terrain and with it creates the privacy that each family seeks giving appreciation to each other while protecting its own territory. Access to the residential building is from the south, along the road upstream the river Bregava, which leads from the center of Stolac to Begovina. It consists of five boarding houses and six residential buildings, as well as a number of auxiliary economic buildings. There is a hierarchy of space reflected in the first, public part of the complex is the access road, the second part is the entrance or front or access yard with four buildings, then a semi-private courtyard and finally a private courtyard house for family life. The third and fourth part of the complex is the semi-private courtyards and family houses, surrounded by a high stone courtyard wall, which extends on three sides of the complex. The border, as well as the protection of the complex, on the fourth, western side, is the river Bregava.

Figure 1. Begovina housing complex, Photo by Z.Rizvanbegovic

HOTEL BREGAVA

The principle of valuing water in building design in contemporary buildings in Bosnia and Herzegovina is sparsely implemented although it would be to advantage of the design.

Such architectural distinctiveness, characteristic for the Ottoman period in Bosnia and Herzegovina, to extend was transfused in the work of Prof Ugljen, through the contemporary narrative in the design of Hotel Bregava, also in Stolac. The Hotel was completed in 1975, currently still ruined after major damaging during last war 1992-95.

The Hotel Bregava is located down the river from the Begovina housing complex but both share the same strong idea of intersecting open and closed spaces that are present in all dimensions. Principle used in traditional house organisation was based on rooms arranged around common central space. Almost the same was applied for the space grouping in Hotel Bregava with some modifications appropriate to the function. Buzaljko (1979) described Hotel in details, mentioning open terraces among which some are extended toward the river, and chain of atrium-inner courtyards, all together making unique spaces with almost invisible line between inner and outturn spaces creating special connection to the river itself, allowing it (river) to visually penetrate into the inner closed and semi closed spaces of the Hotel.

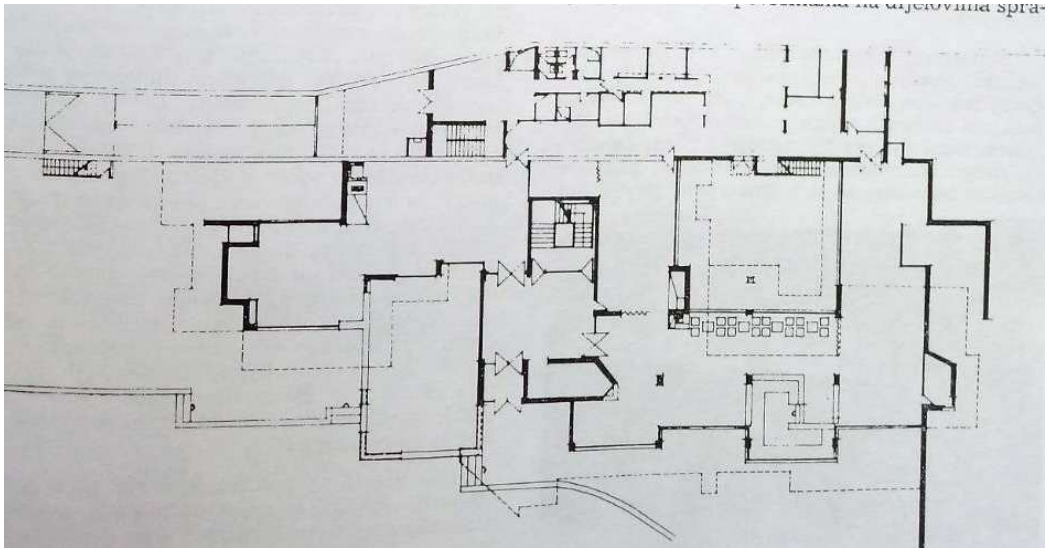


Figure 2. Hotel Bregava, Ground floor plan, E. Buzaljko, Slovo Gorcina,1986

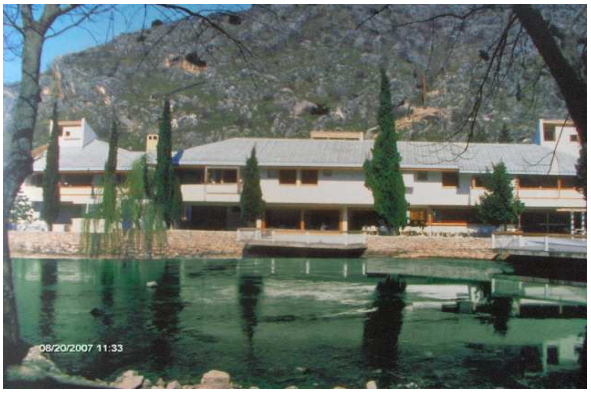


Figure 2. Hotel Bregava hovering above the water (from old hotel brochure)

Highly developed impression of the values of the local tradition, including vernacular architecture is present in the design of Hotel Bregava, and it (tradition) served as inspiration for interpretation of work in contemporary frame. Therefore interventions are rather smooth in expression as an appropriate respond toward the natural ambience.

Thus Zoranic (Bailey, Defilippis, Korjenic & Čaušević, 2020) explained:

"Hotel Bregava in Stolac was designed with strong link to the tradition, but impressible contemporary expression of modernist architecture connected with nature, adapting to climatic conditions and with sophisticated respect for cultural and historical matrix of that particular place. Ugljen achieved it by harmonious forming and composition, sophisticated aesthetics and materialization, but above all by subtle spiritual reminiscences to local tradition."

The hotel layout is somehow longitudinal with no specific emphasis in its form. The advantage of the banks have been brought into the design following the earlier mentioned principles of forming the spaces towards the outside creating the connection with much appreciated water and greenery that surrounds the site. The outer layer is conceived as a sincere reflection of the inner space, creating a rich inspiring content of contemporary expression (Redzic,1983), depicting the projection (doksat) from the traditional houses and translating it to sophisticated aesthetics overhanging the river.

Finally, as Zoranic (2020) remarks, Ugljen is a master of ambient architecture, using modern materials and specific artistic expressions, with surgical accurately and with a fine feeling conveys the spirit and atmosphere of Bosnian traditional houses, courtyards, gardens, neighbourhoods and picturesque landscapes.

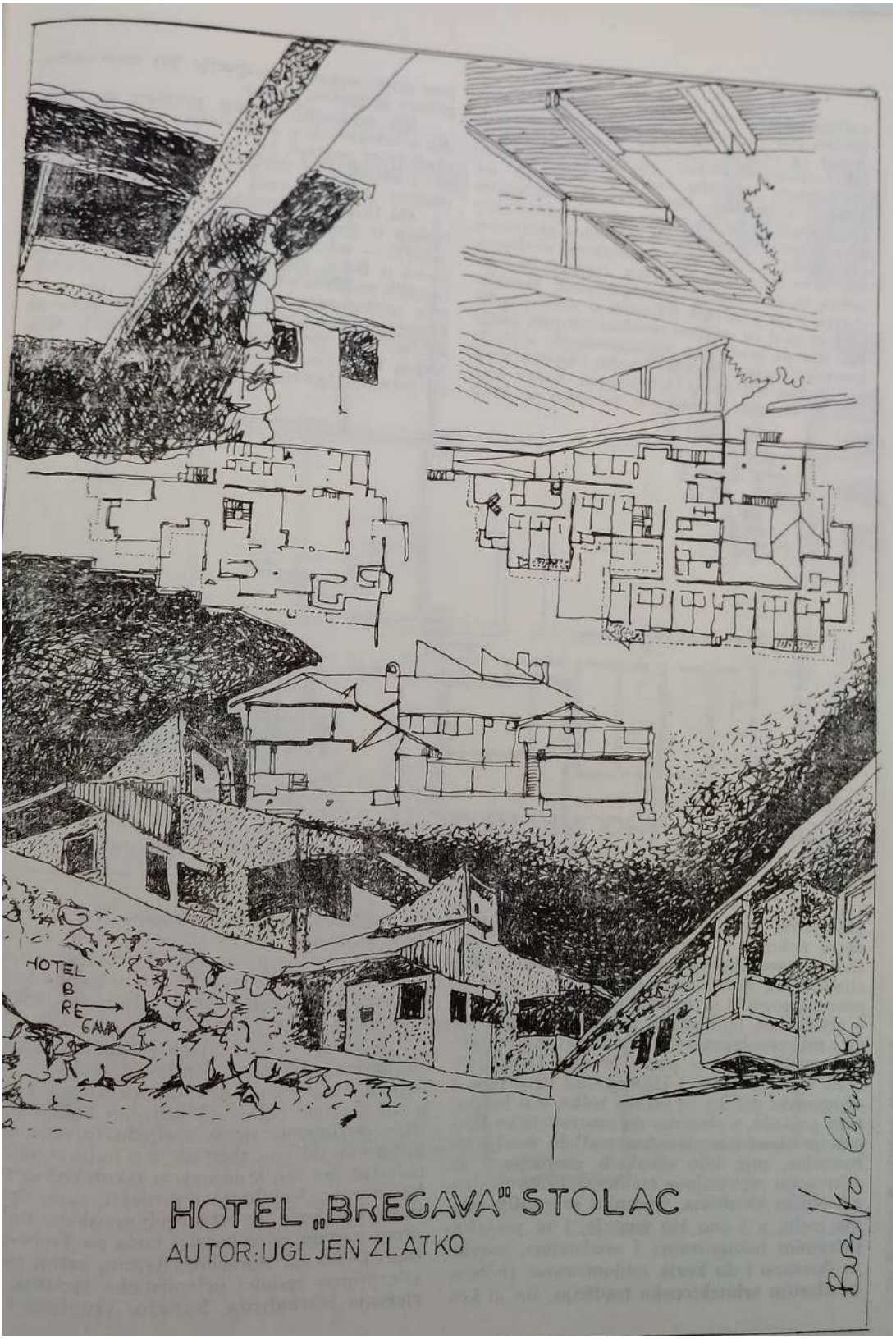


Figure 3. Hotel Bregava, Selected sketches, E. Buzaljko, in Čelić Dž.1986 Slovo Gorčina pg. 23

EVALUATION

The value of residential building tradition in Bosnia and Herzegovina is perceived to transcend materiality, building techniques and space arrangement. A great effort was placed into integrating buildings harmlessly within the environment as the natural setting was hugely valued. Water is especially important natural element that was used for irrigating gardens as they are

inseparable elements of Bosnian housing complexes of Ottoman period. With its visual, aesthetic outcome as well as sensory, acoustic experience water gives calmness and by positioning houses on the banks of rivers and in places of hot summers, like Stolac, a pleasant microclimate and serenity of family life can be achieved.

Same philosophy resulting in the buildings with the similar effect could be seen in other housing complexes from the same period. The merits carried throughout are beyond the historical and architectural frame to which they belong.

The table below (Table 1.) shows the extracted basic similarities in building design approach, particularly in form, materiality, scale, functionality and in final sensory experience. The principles of traditional, vernacular architecture have been interpreted in a modern expression of Hotel Bregava, including appreciation of nature and its elements. The presence of water plays a crucial role in both buildings, and while in Begovina besides the obvious advantages of placing houses on the banks of the river, and providing pleasant water vistas, water also had important role for irrigating inner courtyards. All together it (water) contributed to enhancing sensory experience of the space. On the other hand, in hotel Bregava, the relevance of water could be seen in creating spaces which are in all times interacting with the river by overlooking it and creating less visible borders between open and closed areas.

Building	Form	Materiality	Scale	Functionality	Sensory Experience
Hotel Bregava	Cubic forms with slightly pitched roof; Projection toward river; Horizontality is visible from the river which is intersected with quite dynamic rhythm of roofs.	Local traditional materials of wood and stone combined with new materials (concrete). White plastered walls with opening which are to some extend highlighted with wooden frames. Grey colour of roof is reminiscence on locally used stone for roof covering.	Human scale with no emphasised elements;	Intersection of open and close spaces.	Free vista toward the water; Invisible line between inner and outer spaces;
Begovina	Cubic forms with slightly pitched roof; More distinguished units intersected with gardens; Projection toward river; Obvious division into unites from each side.	Heavy stone walls are intersected with light wooden structure of projection; Stone used for roof covering;		Division into several unites connected by the open spaces.	Free vista toward the water ; Water channels inside each garden enriched sensory experience;

Table 1. Extraction of similarities between the buildings

CONCLUSION

Water is potential icon of being and in many cultures it holds a special place in ritual and mythical behaviour. Concepts related to water have a close relationship to purity and cleansings but also architecturally, they create specific kind of aesthetics with the important sense of belonging, much like the Stolac sites.

Sensory values are the result of multiple elements including experience. In the given examples the importance of water present in the design is underlined. The way we perceive architecture would be completely different if the given context was river less. As an element from nature, water instils various feelings and perceptions. Subsequently, we examine architecture as part of that environment as water has always been the main element in formation of spaces, inside and out.

Both examples/buildings emphasise the principles of special continuity between the exterior and interior. Although the functionality differs there is still a connection between the two buildings in sharing sense of approach to the domesticated feeling of space that reflects the architectural heritage of the area, and the water, the River Bregava, plays a decisive role in this.

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THE GENTRIFICATION OF AL HAFA WATERFRONT, SALALAH, OMAN

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ABSTRACT

The Gulf cities in the past decades experienced the most rapid urban growth. The traditional societies faced a new global wave of market economy, influenced by western lifestyles. Despite contemporary capitalism, this lays a foundation for the exploitative gentrification of the urban processes. Uneven development results in a wave of local market displacements. This article aims to present an empirical study on the old waterfront of Al Hafa in Salalah city. This is the major maritime trade for the incense exports between the Indian-ocean and the Mediterranean worlds, thanks to the port of Samahram which helped the city of Salalah to be a commercial center. In 2015, destruction and demolishing of the waterfront took place due to a new waterfront project. According to publicities, the "Heritage Village" development is supposed to offer a new tourist waterfront with a rich maritime and cultural heritage. What kind of heritage will remain from the old city of Hafa, which has existed for centuries? How will the new plan affect Al-Hafa Cournish? Moreover, to what extent is the new project bound to the waterfront identity? Qualitative research based on data collected from existing documentation, and forms highlights the urban gentrification struggles over the local economy and the wave of new global economy.

Key Words: Displacement, Mass-tourism

INTRODUCTION

The unprecedented urban transformation at the GCC (Gulf Cooperation Council) countries was enabled by the oil commercialization in the region in the early 1960s. Thus, Rapid urbanization has gentrified most of the historical fabric and context. The demand for newly fomented states and the western market economy played a key role in this urban transformation, yet also gentrified the land use. The urban speculation of the GCC coastal cities' due to market competition and the westernization of its social life were the most influential instruments to a hasty urban development.

Indeed, cities are in constant transformation according to the demand of urban growth. However, in this process the historical urban fabric is under risk of separation from its physical space where the social memory occurs. Commonly, when the word 'sea' comes to mind, it is considered as the water urban component. Thus a city with waterfront access has a unique identity either inside its cities memory or the memory sense in its road that all open toward the sea. The present study addresses questions related to the coastal urban development in Oman. By arguing Al-Hafa case, this study shall highlight the concept of gentrification of the urban project and city identity. How is this new project development within the historical fabric perceived and understood by local citizens?

THE SPATIAL MEMORY AND THE CITY GENTRIFICATION

Indeed, the coastal historical fabric that cities acquire includes different identities in relation to the coastal, social behavior and its built environment. A review of literature illustrates concerns for the future of the urban heritage and the city identity under the pressures of modernization (Abu-Lughod, 1980; Lewcock, 1978; Rghei & Nelson, 1994). Nevertheless, tourism appears in many of the urban development schemes for coastal cities, with the communities' memory of the built environment at the center of focus and discussion.

Perpendicularly, the contemporary urban planning understood gentrification practices as postmodern expressions. Many authors elaborated this hypothesis from the observation of certain aesthetic and functional characteristics prevalent in these processes (Harvey 1992, Zukin 1995, and Featherstone 1992). They built this hypothesis from the observation of certain aesthetic and functional characteristics prevalent in the gentrification processes. Thus, these process gentrified the visual attractiveness of the sites, the juxtaposition of architectural styles, an emphasis on monumentality, while recognizing market forces as main driver for change.

The gentrification process in urban conservation sites involves the identity of the place as a model of intervention that alters the cityscapes. Thus, the process is accentuating the architectural features or transforming them in some case to generate a heightened visual impact. Furthermore, it is adjusting the new development to the demands of the market interest, planning and urban cleanliness intended to promote the re-appropriation of the area by the middle and upper classes. Meanwhile, these process on the ground impacted in exacerbate social segregation the socio-spatial boundaries by fragmenting space into distinct places (Leite, 2013).

Undoubtedly tourism of these gentrified opportunities in a way serves a resiliency for the re-use of buildings that would otherwise become redundant. Therefore, it enhances accessibility to sites that preserves their rich heritage and characteristics, whist providing visitors and local community with unique experiences (Orbaşli 2000).

However, the current tourism development is missing a holistic approach to the urban fabric, rather than beautification on streetscape. A development that considers the environmental and social values of places together with commercial interest of the project initiative is required. Indeed, the gowning commercial activities that are generated by tourism can negatively impacts on the land values and the historical sense and identity of those heritage areas.

Thus, the gentrification processes add real estate value by contributing to the symbolic strengthening and sense of belonging through the enhancement of local culture of these historical sites. Indeed, the new developments attract local and external tourism by promoting cultural heritage as a sort of detraditionalization that transforms heritage sites to scenery for the absorption of consumer culture (Leite, 2015).

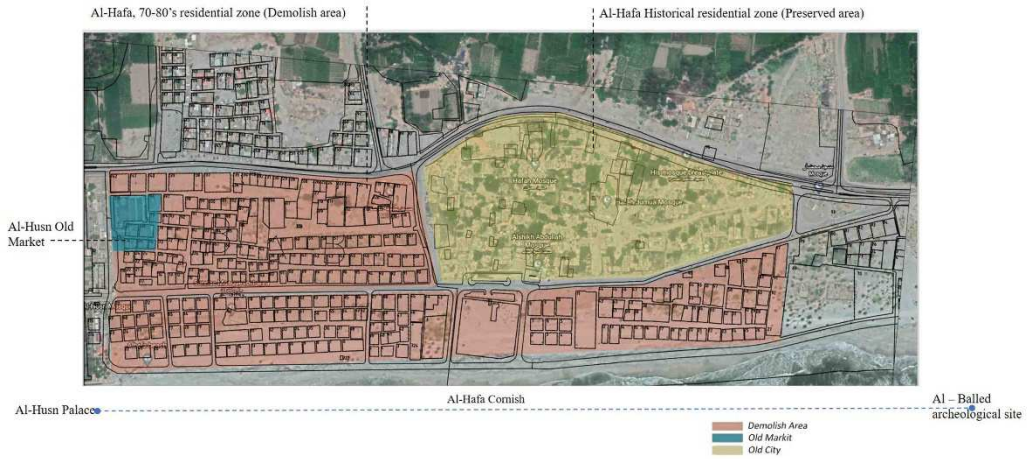
The research discusses empirically those concepts through the case study of Al-Hafa district, in Salalah City in Sultanate of Oman. Al-Hafa Cornish is Located at east-coast of Salalah city, a thriving coastal public space and destination for the local community. It is the gateway to the sea for families, young people and children to gather and enjoy the sense of the sea, local foods and shop at the local market. The area is planned for new tourism attraction features, with a visual tradition sense. It not only has historical values but, is also rooted with nostalgic memories for its citizen.

AL- HAFFA MEMORY AND IDENTITY

Coastal cities are now increasingly popular throughout the developing world. This is especially true for the GCC with its spectacular urban development. This trend is not only effecting the historical fabric and context, but is also changing the local market, spatial-social profile and threatening the identity and memory of the place for the citizen.

Al Baleed, 8th century until 16th century AD, is the one of the five Omani sites registered by the UNESCO- world heritage sites (UNESCO, 2000). It is the oldest harbor that has direct connection to the Indian Ocean shores. The harbor's importance, along with the Silk Road access to the Sea for exchange of the frankincense established a connection between the city, China and the Mediterranean Sea (Wippel, 2013).

In the 19th century, Salalah city has been ruled by the Sultanate of Muscat. Later, between 1932 and 1970, it was the Sultanate of Muscat and Oman' capital under Sultan Said bin Taimur. Back then the palace of the Sultan Tiamur reigned from *Al-Husn* palace. *Al-Hafa* district is divided to three section, *Al-Husn* Palace, *Souq Al-Husn* (which get its name from *Al-Husn* palace), and *Al-Hafa* residential area. The last section is divided into historical residential Omani houses that are unique with its Omani vernacular architecture. Houses partially faced the water back to the 70 and 80's, see Map 1, and Figure 1. Al-Hafa area in particular has a unique sense of identity, and makes citizen feel connected to coast with frankincense.



Map 1 1: Al-Hafa districts, Source: Authors

Figure 1 1: The old district of Al-Hafa (demolish area), Source: (Alwadi, 2014)

The built heritage of the old waterfront of Salalah city, *Al-Hafa*, is also being affected by the new urban expansion. Thus, a new master plan is erecting a modern tourism project in the areas which are prompting the leisure-oriented waterfront, with hotels, residences, shops, and restaurants, but it has not yet been realized.

AL-HAFA WATERFRONT PROJECT

The announcement new project took a place in 19th of November 2017. The official Journal *Omandaily*, announcement that,

'*Excellency Sayyid Muhammad bin Sultan Al Busaidi, Minister of State and Governor of Dhofar, Chairman of the Ministerial Committee Supervising the Haffa Region Development Project in Salalah, have signed usufruct agreement for the Haffa Region Development Project'* (*Omandaily*, 2017).

Back then Muscat National Development and Investment Company (*ASAS*), was the responsible of the new planning developing and executing of Al-Hafa waterfront. While, 2020 was the year of the initiative executing, the current situation in pause with no public announcement regard the project.

Previously of the agreement, in 2013 State and Governor of Dhofar, announcement that they shall start to demolish the Al-Hafa waterfront of the 70 and 8o's, see Map 1. Thus the planning of Haffa Region planning, in accordance with the agreement, for developing the historical old city of Al-Hafa and demolish the rest of the area. Nevertheless, a decree has already stipulated the expropriation and relocation of residents and the demolition of their houses, and the national budget has also allocated funds for this purpose. Thus, the demolish have took a place later by 2015, the company responsible of demolish process is the Reliance engineering and consultancy, see Figure 2, 3.

Figure 2 : Reliance engineering and consultancy, Source: (Authors, 2019)

Figure 3 : Figure xx: the project phase one: The Demolishing Area, Source: (Twitter مشاريع عُمان _ @omanprojects, 2015)

With title of:

'*Al Hafa Waterfront, Reconnecting Salalah to the ocean on a magnificent stretch of pristine beach that captures the imagination'*, (WATG 75, 2020)

Wimberly, Allison, Tong & Goo, which is known with WATG 75, an international architectural firm, is publishing on their company web-site Al-Hafa new development project. The published design theme and concept include a design area of about 682.000 square meters with 470 key hotels and heritage village on 117.500 square meters. Retail occupies 30.400 square meters, a new souq on 9.200 square meters, while an office development area in 32.000 square meters and residences in 33.400 of the total project area. See the proposed master plan, see Figure 4, 5.

Figure 4 1: Al Hafa Waterfront – new master plan. Source: (WATG 75, 2020)

The new design claims the preservation of the geological formation of the area, that is rich with the beachfront, farmlands and the local mountain to the north. Thus, the new planning design diversity shall encourage and nurture the community social gatherings with respect to the local and community spirit.

Furthermore, the new master plan proposes a heritage village design, which reflects the sense of place. The design highlighted it as showcase that celebrates the extraordinary location, with its culture, maritime history, and direct connection to the public, see Figure 6, 6a. While the Al-Hafa Cornish design serves as a promenade that enjoys the Informality that brings people to waterfront beaches, see Figure 8, 9.

Figure 5 1: Al Hafa Waterfront – new master plan. Source: (WATG 75, 2020)

Figure 6 : The historical Heritage Village. Source: Authors,2019

Figure 6a : Heritage Village – new proposal. Source: (WATG 75, 2020)

Figure 7 : Al-Hafa old cornice (demolish area). Source: (Šalna J., 2014)

Figure 7a : Al-Hafa promenade. Source: Source: (WATG 75, 2020)

ASAS, the execution company, has not yet started the construction phases which results in questions of the project validity from the public. The new project with its gentrified process became a center of discussion for the citizens who are missing their old urban districts and its waterfront. They have concerns about the impact of the new project on the city's spatial ground and identity sense.

Thus, by focusing on the presented documents of the new planning design that was publicized. the new planning is showing the new urban context following the hydro-chromatic sense of the existing architecture characteristic. A gentrification plan that shows the visual attractiveness of the sites, the juxtaposition of its architectural details, while emphasizing a modern waterfront that captures the culture identity and water sense of the place.

This led the author to question how the local citizen is perceiving the new gentrification waterfront and their reflecting toward its process

CONCLUSION (IS THE AREA GENTRIFICATION A PROBLEM OR PROMISING?)

(AthyrOman, 2016), announced that a civic initiative is taking place with project stakeholders and the Government state of Dhofar. Al- Hafa Development and Investment Company, a civic company under establishment, was chosen as a closed shareholding for Al-Hafa citizens. The company would act as one of the project stakeholders to invest in the tourism sector.

Furthermore, the publicity and official radio channels have run different programs regarding the Al-Hafa waterfront project, (*AthyrOman* 2016 -2018, *Shabiba* 2019), to discuss the citizens' views towards the new project. The interviews were with the citizens of the old city of AL-Hafa, and the owner of the local shops that run in AL-Hafa souq. The citizens had a common view toward the project, since they admit it would be an opportunity for the region, which is historically known as a tourist destination from Oman and abroad.

However, they highlighted the concern that the Al-Hafa Waterfront project gentrification process should highly consider the identity and preserve the Omani architectural character. Thus, the area with its waterfront acting as city center for decades, a place where city meets water, and families' activities and younger gatherings take place year-round.

Furthermore, (Bahajaj, 2018) stated a question via the Athyr Oman;

"الكل يقف مع مشروع تطوير الحافة سياحيا ، فهذا استثمار واعد سيعم خيره ليس محافظة ظفار لوحدها ، وانما لعموم البلاد ، لكن لا يجب أن يحمل صفة الثورة ضد هذه المنطقة الاثرية و الاستراتيجية الواقعة على المحيط الهندي والتي بها منطقة البليد التاريخية التي كانت مركزا تجاريا وثقافيا في ذلك الزمن"

(Bahajaj, 2018)

This is interpreted to:

"*Everyone stands with the tourism-led development project, as this is a promising investment that will bring benefifts not only to the Governorate of Dhofar, but also to the whole country. However it should not bear the characteristic of a revolution against this archaeological and strategic area located on the Indian Ocean and in which the historical Al-Baleed region was a commercial and cultural center at the time*".

Thus, the question of either the new project is promising or its a problem to the city, has no answer, yet. However, The city becomes a platform of discussion towards its future while citizens passing by the empty waterfront always question the of the city's future and its place memory.

by reflecting on the gentrification process concept, the result shows the political systems, government bodies, and decision-making mechanisms have supported the new project as a promising plan for the city. on the other hand citizen accepted it with hopes of promoting the city cultural heritage. while in fact the gentrification process aid the neo-liberal tourism industry is marketing the heritage sites as goods in the consumer culture market.

In conclusion, undoubtedly, the water plays a key role in identifying not only Salalah spatial economy but also scripts its unique residential districts. It's a historical engagement between the water as material to human life and people who live nearby. since water, as living organism and urban structure at the same time, established a historical relationship with Salalah socio-spatial context. Thus, citizens are concerned regarding the water as an identity and memory in risk of being lost due to the contemporary neo-liberal economic practices.

Salalah is the "secondary city" in Oman,but has not attracted much public and academic attention. Thus, a further study would take place regarding How will the new gentrification process affect it on the city ground, local souq and its socio-economic spatiality.ü

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MOBILE HOUSES: NEW SPATIAL SEARCHES ON CHANGING URBAN LIFE

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ABSTRACT

Mobile spaces display such features as flexibility, movability, portability, as well as these structures are of dynamic, portable, demountable and relocatable. Early mobile houses have been designed through architecture without architects in accordance with user preferences. Considering the effects of built environment on nature at the future, floating houses intend to propose a design solution to climate change, natural disasters, increasing human population. Floating architecture is a flexible and reversible mode of urbanization and responds to housing problem considering new urban requirements.

This paper emphasizes the increasing use of mobile housing due to necessity (shelter, working, etc.) in several countries such as Netherlands, Hong Kong and USA. The aim of the research is to underline the transformation of holistic approach of housing, through concepts such as temporality and flexibility. Amsterdam, Hong Kong and New York which reflect distinct behaviors of mobile architecture are selected as the main case areas in terms of various problems such as increase of homeless people, population growth and lack of land in urban area. Thus, the case study mainly focuses on the changing sheltering habits and housing problems in view of the mobility approach of these contemporary cities.

The main argument of the paper questions whether the space has to be static or not, considering built environment and urban continuity. Mobile designs are of a hybrid category between automobile and building. The idea of mobility in architecture causes to transformation in spatial reality through reshaping human experiences and spaces.

Key Words: flexibility, mobile houses, movability, floating architecture, changing sheltering habits

INTRODUCTION

People are living more mobile lives than ever, driving change in design and architecture. The architectural space is recognized as a life experience within the frame of the continuity of time and movement factors (Zevi, 1993). To Schulz (1971) the architectural space should be identified as the existential space of the user. It is possible to reach a common idea that the space is a living concept which can change according to human senses and time, as well as perceptual, cultural, environmental and social dimensions. Schulz reveals that the architectural space has meanings beyond the physical dimensions of a human being, which is formed by the continuity of living and perceiving of environment. As Norberg Schulz (1993), Bruno Zevi (1971) considers the architectural space as a vital experience within the framework of the continuity of time and movement factors instead of a static phenomenon.

The study takes the concept of mobility in architecture as a framework and tries to look at re-shaping human experiences and spaces. Beginning with the reality of urban nomads, the study deals with urban mobility with new experiences and spatial extensions. The relationship between spaces and urban environment is discussed in context of new dynamics of mobile architecture. It deals with re-shaping human experiences and spaces in the concept of mobility in architecture. The relationship between spaces and urban environment is discussed in context of new dynamics of mobile architecture. It aims to prove that the mobile spaces in urban area behaves the extend of static building area and provokes them. Considering the dynamics of urban nomads, the paper deals with urban mobility with new experiences and spatial extensions. In terms of design criteria, mobile spaces should be movable, portable, flexible, temporary, light, functional, ergonomic, aesthetical, ecologic and economic. The types of mobile spaces are listed as tents, light structures (caravans, containers, prefabricated houses, etc.), movable structures on wheels or floating (yachts, etc). The spaces being movable, portable, flexible, temporary, light and multi-functional creates new movement areas to users. In this respect, the context of housing for users is changed with urban mobility concept. For this reason, the sheltering principles were examined with mobile design principles such as mobility, flexibility, light and multi-functionality. In the scope of research, Amsterdam, Hong Kong and New York which reflect distinct behaviors of mobile architecture are selected as the main case areas in terms of various problems such as increase of homeless people, population growth and lack of land in urban area. Thus, the case study mainly focuses on the changing sheltering habits and housing problems in view of the mobility approach of these contemporary cities (Figure 1).

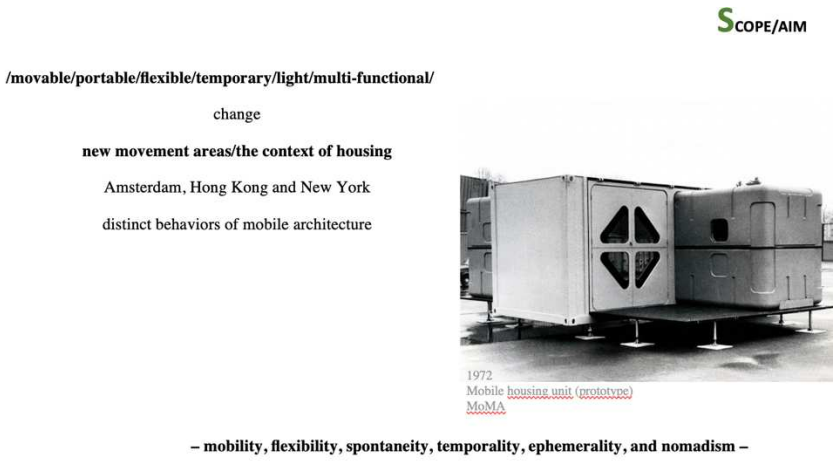

Figure 1. The framework of the research scope/aim and keywords.

New Spatial Searches: The Concept of Mobility

The concept of mobility is not a new phenomenon, it reveals with the search of temporary spaces to live for people have to move another point depending on some natural and environmental condition throughout the history. From past to present, people have been developed different movement forms in respect to temporal and spatial possibilities of their habitats. The concept of mobility focuses not only sheltering or housing solutions, but also public spaces as interaction points with variable functions and uses for the continuity of urban life. These spaces, which are responsible for the communication of the city, should be the places that facilitate the life of the people of the city in terms of their functions and provide opportunities for the integration of their social and cultural communication. However, production and consumption habits dominated by capitalism has created a popular

cultural environment. In the popular cultural environment, space has also become an object of the system of social signs and consumption patterns. These values, as Baudrillard (2004) points out, mediate in proposing new lifestyles, creating social class, status, prestige, difference, privilege and identity. Since these values uploads people different urban identity, the metropolis behaves as actually a place of resistance. It is the struggle for existence that is the most fundamental source of this resistance. In today's cities, the definition and analysis of the tension between subjects and identities and space becomes difficult. According to Stefano Boeri (2003), global networks and movement actually increase the boundaries, and this reality is noticeable both in our environment and at the global flow level. Not only production and human relations, but spatial structuring of all scales and qualities are affected by this shocking transformation. The dynamics of modernization and capitalism consistently redefine human living environments; old, familiar habitats are replaced by new habitats.

The phenomena linking design to the "place" are part of the natural environment. Along with modernism, the relationship of man with the environment and nature has been redefined and the act of space and architecture has been transformed (Berman, 2008). Instead of a network of spontaneous relations in the traditional period, a new era has begun with a production-consumption cycle that did not exist before, as Sander (2003) described. At this point, the space was separated from its place in the traditional period. Integrity, which constitutes the urban system of the traditional period, has shown a break. The architect and the discipline of architecture have gained different meanings in accordance with these changes. The architectural production that brings up the necessities of urbanization or the phenomenon of migration is quite limited. According to Corbusier and the rationalism of the 1930s, the concept of the home is based on a purely mechanical function. Like the concept of car produced by an industry, a new industry constituted the concept of home production, so that wholesale and mass production began. The concept of standard housing includes multiple functions in a minimum space.

Architecture has a wide level of interaction especially in the 20th century with change, rapid, moving objects, discourse and application. Aircraft, automobile, ship, spacecraft, inspiration for architects, developing technology, diversified construction techniques and changing life architecture has changed the structure of the product. The visual forms of transport: ships, cars, trains, aircraft, spacecraft, have all been used by designers to add a specific image to a building, even though the inherent message for a static structure must ultimately be sterile (Figure 2). Truly mobile buildings contain the essence of this romance in their purpose and therefore have an additional potential to make use of an extra creative dimension to that of the permanent structure (Kronenburg, 2013).

Figure 2. Zep Diner. Vehicle imagery in a static structure, Los Angeles, 1931.

With the possibilities of new materials and technologies such as prefabrication, suspended stretching, swelling or modular systems, many buildings which are movable or can be installed and lifted many times are handled under the title of mobile architecture. Mobile building is the building that moves with the simplest change (Kronenburg, 2003). But it is very difficult to handle these moving buildings in a single pot. The first reason for this is that it is possible for the movement and mobility to interfere with the architectural product in various ways at different levels. In the case of a building, many forms of mobility can come under the heading of "mobile architecture from the fact that the windows, doors, a wall or the entire walls of the building are mobile, and that the building itself can be installed and removed as an object independent of the ground.

Today the workplace is moving into the home, thanks to decentralizing computer technology. In global, decentralized hyperspace of function, its location will be irrelevant. You can take your physical reality practically anywhere (Cordescu, Kronenburg, 2002). Humans adapted more easily to new conditions and had more "universal" mechanisms than houses. Mobile buildings make it possible to keep moving. For contemporary design, economic, lightweight, flexible approach to providing shelter. The change is being brought about by the information age, which has made it possible for many us who are still immersed in the world of work to also seek out a mobile life.

> "If mobile technology frees us from the limits of place, letting us live and work virtually, it also can leave us feeling hollow, placeless, craving real people and locales. Perhaps most critically,our mobility depends on gobs of electricity {topower all those gadgets] and petroleum (to fuel all those planes, cars, and conveyances). Clearly mobility has kinks to work Out as we march into the future (Siegal, 2008)".

Mobile society and mobile housing system developed by Winfried Baumann aims to address the specific situations and needs of urban citizens. In addition to offering variable opportunities for mobility, there are several versions of Mobile Urban Housing for different climatic conditions of different locations. The basic model of each reduced series of foundations serves as a place to sleep. It can be changed by means of individual additional equipment such as network connection and self-contained energy supply, painting in different colours, double bed or family or as luxury version according to the particular situation of the user. According to Baumann, these emergency, space and mobility-optimized accommodation should not only be understood as a temporary solution. Quickly and practically, Instant Housing offers a place to stay for people who are victims of different social changes; it also helps, for example, modern working nomads who are expected to demonstrate permanent spatial and temporal flexibility due to their work. Despite its relevance in daily context, the housing area of urban nomads are also an art space; His sculptural-functional character draws attention to the changes in our postmodern mobile society (Baumann, 2013). The project Instant Housing is located between material functionality and an artistic concept that responds flexibly to a changing, more mobile society with its spectrum of demands, and visualizes all this in an exemplary way with its many different models (Figure 3).

Figure 3. Winfred Baumann, Instant Housing H-Klasse, H3

To provide shelter, a sense of place, a mirror of cultural and societal endeavours still inform new mobile architecture. Tents, lightweight structural frames, and wheeled and floating structures figure in the range of recent projects. However, the possibilities of new technology are also shaping this development. Pneumatic, tensile, and kinetic structures provide the opportunity for new dedicated architectural forms. With the advent of trucking, and in response to the post war housing shortage, new mobile housing strategies developed, including the "flat-pack" (Cordescu, Kronenburg, 2002).

Lot-EK designing urban living spaces with industrial production in New York. One of them is the living units which are designed with transportable container houses (shipping container). These container houses are durable, modular, portable units. The units are transported with large trucks, cranes and ships (Figure 3). These simple, temporary and modular units can be used in storage units, small area living units, office units. Container houses can be increased in parallel to the number of people. There are sleeping, sitting, bathroom, kitchen and storage units in container house. Units produced in port cities are shipped with container carrier ships. Even if the view that the MDU user sees in his window is constantly changing, he will have a residence all over himself. Kisho Kurokawa and Richard Rogers are the designer of MDU units. The structure is a 40 ft transport container and is replaced in a replaceable housing. Contains various modules for various functions like containers, cooking, washing and sleeping. On a ship or pier. When delivered to an MDU region, modules slide outside of the cabin, like extrusions, and create an internal corridor with a new created space in the cabin (Figure 4).

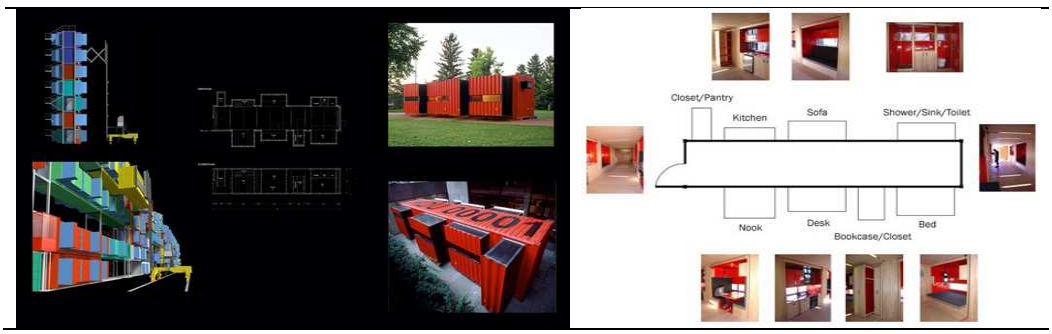

Figure 4. MDU Project, LOT/EK Architecture, New York, 2003

Urban Nomads and Mobility

The artist from New York, Michael Rakowitz, describes this design proposal, which provides warm air by connecting to the ventilation outlets of existing buildings and serves as a temporary shelter for the homeless, with a set of propositions describing parasitism. The artist from New York, Michael Rakowitz (2006) describes this design proposal, which provides warm air by connecting to the ventilation outlets of existing buildings and serves as a temporary shelter for the homeless, with a set of propositions describing parasitism:The parasite survives by clinging to the tissue of its host, its internal organs or its external surface, and paraSITE connects to the HVAC (Heating, Ventilation, Air Conditioning) outlets of buildings and settles on their walls. The parasite provides its nutrients, energy, and sometimes the necessary thermal conditions from the host; With its double wall, paraSITE heats up with the hot air from HVAC. The host cell is not passive to the parasite, it develops various defense mechanisms and tries to get rid of it. When the first prototype was tested in Cambridge in 1997, residents tried to make their buildings homeless proof by bending the fence of the ventilation outlets (Figure 5).

Since February 1998, 30 paraSITE prototypes have been built and distributed to some homeless in Cambridge, Boston, New York and Baltimore. Most of them are produced from temporary materials such as plastic bags, tapes, etc. that are easily found on the streets [10]. ParaSITE has an agitational effect for a passer-by; it is similar to an installation with its relationship with the building and its visuality. Rakowitz does not propose this project as a solution proposal and states that it is not a proposal for a reasonable shelter. The starting point of ParaSITE is to put forward a symbolic strategy for the existence of the homeless in the city. It aims to emphasize the problematic relationship between those who have houses and those who do not. “I wonder if one day we will wake up to see that ParaSITE camps surround buildings like an ivy. Rakowitz asks. This project raises the problem of homelessness which is increasing with this project.

Figure 5. ParaSITE, Designer: Michael Rakowitz, 1998.

Developed for the homeless, who collects recyclable waste in New York City, these tools allow the homeless to carry their own belongings and recyclable waste, as well as the ability to safely fit inside. With a vehicle that is designed specifically for the homeless, the designer is able to identify their working and living conditions, which cannot be identified with stolen objects such as shopping carts; and to make their resistance more visible to other inhabitants of the city and to reduce their "otherness". In this context, the communication value of this tool is in the foreground. Wodiczko (1991) imagined hundreds of these vehicles to be produced in the city with the direct participation of the homeless and tailored to their special needs; but these tools have not become widespread, except that they have been exhibited in galleries many times and a few have been put into use (Figure 6).

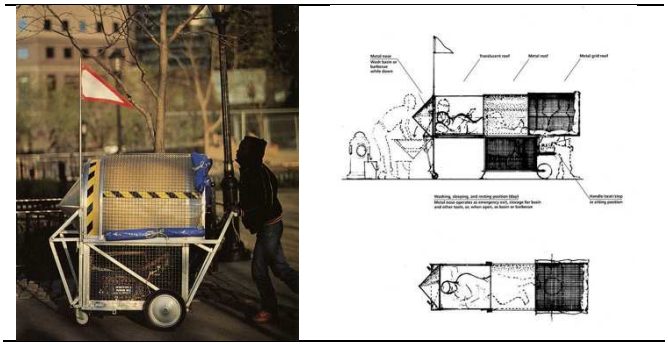

Figure 6. Homeless Vehicle – Designer: Krzysztof Wodiczko, 1991.

At the intersection of art, contemporary design, and social activism, Winfried Baumann’s (2019) ongoing Urban Nomads series has as its focus the harsh realities of homelessness and neo-nomadism, often in conjunction with

issues of housing, food, and restricted mobility. Foremost among the projects that comprise Urban Nomads is Instant Housing, a collection of customizable and readily mobile residential units for those in need of shelter. Formally trained as a sculptor, Baumann brings to each of his projects both a careful consideration of function and a mastery of sculptural technique (Figure 7-8).

Figure 7. Urban Housing - Röttingen - Year 2016 –Rough Sleepers Capsule Tower.

Figure 8. Urban Housing - Nürnberg - Year 2012 –Rough Sleepers, Occupied Wall Space

New Spatial Searches: Mobility of Place

Floating architectural design phenomenon is seen as an adaptable strategy for the formations that affect the future of the world. Examples of portable structures through water take many forms, from sailing ships to moveable cities; carriers already mentioned. This idea was carried on and can be seen in examples of large movable structures which can function as moveable cities on water, as seen in projects such as the Blow-out city by Archigram. Peter Cook's 'Blow-out Village' (1966) is proposed as a mobile hovercraft structure that can be used to rehouse people in a disaster. While floating structures are placed on the water in architectural design, it is possible to emerge as alternative design areas, to design for new functions and to create floating residential areas. Unpredictable negative developments such as rapidly increasing population and urbanization with climate change, and future floating city designs remain uncertain. This idea was carried on and can be seen in examples of large movable structures such as Navy carriers and oil plat forms which can function as moveable cities on water. Blow-out Village Project is designed as habitable and movable units, creating an inflatable village for needed human activities (Figure 9).

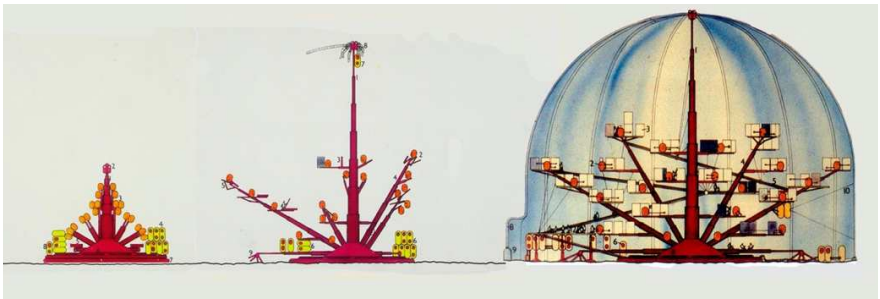

Figure 9. Archigram/Peter Cook's 'Blow-Out Village' (1966) proposal for a mobile hovercraft structure that can be used to rehouse people in a disaster

Considering emergency architecture, what usually comes to mind are villages razed by flooding or by earthequake. From catastrophe emerges a new home for a new life, a new future to rebuild from the debris. But there are many other emergencies. Political and armed conflicts displace tens of millions of people every year. These are refugees. A refugee camp can be accepted as a temporary city. Syrian refugee's tents are reflected in a pool of rainwater at a refugee camp in the town of Bar Elias, In the Bekaa Valley, Lebanon. There are some Syrian refugees use a floating piece of wood to move around after heavy rain caused floods at a refugee camp. It has a spontaneous

generation in a city with no natural evolution and origin. This place is not recognized as a city because its citizens are invisible because of many socio-political factors (Figure 10).

Figure 10. A Refugee Camp in the Town of Bar Elias, In the Bekaa Valley, Lebanon.

Architecture can help to call refugees urban nomads and their camps "mobile cities." Running water and the disposal of waste are not the only requirements in the area. It needs some social and public activities and places as seen on the picture showing Syrian refugee children play out at a refugee camp. These spaces reflect an ephemeral city whose inhabitants have been placed there like pieces in a puzzle, a stand-by city excluded by architecture (Figure 11).

Figure 11. The Refugee Camp with physical and social environment, In the Bekaa Valley, Lebanon.

New Spatial Searches: Floating Houses

Floating house use is found in many countries of the world. Floating houses in Asia and the neighborhoods made up of these houses are a kind of nomadic lifestyle. It is possible to see floating houses, a type of mobile housing, anchored on the riverbanks in the Slum region in Hong Kong. The government of Hong Kong wanted the floating houses to be moved to another region, thinking that they created a bad image among the skyscrapers, but could not convince the homeowners (Schittich, 1998).

There are many floating villages in Southeast Asia not only in Cambodia but also in countries such as Vietnam, Thailand, Indonesia and China. Although the floating habitats in Cambodia look like normal houses, the floating villages of China mostly consist of small boats. China has used floating villages for thousands of years. Its floating village in Aberdeen Harbor in the Southern District of Hong Kong is China's most famous floating village (Figure 12).

Figure 12. Mobile Housing Boats Aberdeen, Hong Kong, 2011.

The people living on boats in Aberdeen are mostly formed by fishermen who came to Hong Kong between the 7th and 9th centuries. While the British built residential areas in the main harbor of Aberdeen on Hong Kong Island, the area of the floating village has greatly increased and a large number of Chinese caused the merchants to settle in the region. The total population of vessel occupants in Hong Kong is estimated to be 2000 in 1841, peaking at 150,000 in 1963 and dropping to 40,000 in 1982. Floating villages in Vietnam mostly consist of small rafts. Rafts are formed from wooden planks supported by materials with floating properties such as empty barrels and buoys (Koekoek, 2010).

There are many pictures and laws in the municipal archives telling the history of life on water in the Netherlands, especially Amsterdam. At the end of the 19th century, ships made of steel material replaced wooden ships, and many wooden ships were used for transportation in the city. Unlike a floating boat built as a living space in floating residences in Western Europe, the concrete floor is a structure built on a floating foundation. This solution is inexpensive and technically sound and does not require as much maintenance as wooden ships. The fact that many people prevented them from buying a normal house after the economic crisis in 1930 caused them to move to cheaper wooden boats. After the Second World War, the number of floating boats increased due to the shortage of housing. At the end of the 20th century, the number of floating dwellings in the Netherlands is estimated to be 10,000. The general principle of living spaces created by floating housing designs suggests a life style in line with the expectations of human life of the standard building on land. Instead of struggling against the rising water levels in the Netherlands due to the effect of global warming, new concepts are considered for above-water architectural structures by accepting the situation. The 'Inner Castle' design, which is planned to be implemented in the Netherlands, is seen as the first floating apartment in Europe. Compared to other above water structures of the floating apartment, it offers a futuristic approach to the common living areas besides the individual user (Figure 13).

Figure 13. The Citadel, A floating apartment complex, 2014, Waterstudio-Koen Olthuis, Netherlands.

Architects from New York to Shanghai are increasingly being confronted with the same problem: Too little space for too many people. The challenge of developing new habitable spaces within the city is not easy. Many architects, contractors and urban planners are tackling this situation with floating architecture. Whether it's Asia, the US or Europe, living space is becoming an important resource in the major cities of the world. Most cities have little room to grow in the central urban area and increasing rents are symptomatic of this crisis. Metropolitan regions in the immediate vicinity of water are trying to develop new living spaces with floating houses in response to the housing shortage. Low-rise residential buildings are placed on the floating concrete foundations on Lake Ijssel in Amsterdam. The height of floating buildings does not exceed two floors, as hollow foundation tanks are able to withstand not too much weight of the surface structure (Figure 14).

Figure 14. A floating apartment complex, 2011, Marlies Rohmer, Amsterdam, Netherlands.

Floating houses take care of two problems at once: They meet the demand for living space in large cities and also serve as flood protection. Coastal cities in particular are extremely affected by climate change and the resulting rise in sea level. They are therefore looking for new strategies to cope with the water and turn the disadvantage into an advantage. In Western Europe and the Netherlands, people began to live on boats and ships in Amsterdam and European cities from the 7th century onwards. The invaluable land in Amsterdam has caused people to turn to houseboats. Some of these floating houses were created as a result of the restoration of boats older than 100 years, and some of them were built on barges, without motor (Figure 15).

Figure 15. Floating houses, 2019, Waterstudio.NL, Amsterdam, Netherlands.

CONCLUSION

Mobile areas exhibit features such as flexibility, portability, portability, and these structures are dynamic, portable, removable and movable. The first mobile homes were designed with architecture, without an architect, according to user preferences. Floating houses aim to offer a design solution to climate change, natural disasters and increasing human population, taking into account the effects of the built environment on nature in the future. Floating architecture is a flexible and reversible form of urbanization and responds to the housing problem by taking into account new urban needs.

Mobile architecture conflicts with the heavy, static, permanent and monumental image of the architectural product. Mobile devices have always existed for practical reasons as part of permanent settlement. They appear in many ways as complementary elements within the built environment rather than as alternatives. Rising speed and changing rhythm of life with industrialization has led to many discourses that architecture has been unable to keep up with the changes that modern life could not meet the demands of modern life. Although mobile architecture is a reflection of the transformation process of the relationship between space, place and context, it is an operational expression tool that draws attention to the existence of urban nomads brought by urban life. The positive emphasis of nomadism allows mobile architectural devices to create free and mobile spaces that focus on functionality, user and people. Today, the same discourse is used when justifying the architectural products put forward under the name of mobile architecture:

> "Society is changing dramatically! In a life that demands more demanding from the physical environment and where economic, social and cultural climate is in a constant change, an architecture that responds to change and has a wide variety and needs is sensitive (Kronenburg 2003)".

The research highlights that in some countries such as the Netherlands, Hong Kong, and the USA, the use of mobile housing is increasing due to need (housing, work, etc.). The aim of the research is to highlight the transformation of the holistic housing approach through concepts such as temporariness and flexibility. Reflecting the different behaviors of mobile architecture, Amsterdam, Hong Kong and New York have been selected as the main case areas for various problems such as the increase of homelessness, population growth and lack of land in the urban area. Therefore, the case study mainly focuses on changing housing habits and housing problems in light of the mobility approach of these contemporary cities.

The paper argues the space has to be static or not considering architectural existence and urban continuity. Considering the concept of mobility, mobile (without building) designs have existed for centuries; they are in a hybrid category between auto-mobile and building. Mobile designs display a wide variety from nomad tents to temporary structures. The field is dramatically diversifying if the mobile is accepted as disappearing structures. The concept of mobility in architecture transforms into the re-shaping human experiences and spaces. It is the fact that the mobile spaces in urban area behaves the extend of static building area and provokes them. Beginning with the reality of urban nomads, the concept of mobility presents the users new experiences and spatial extensions.

As a result, mobile, portable, flexible, temporary, light and multi-functional spaces create new areas of movement for the users. In this context, the residential context for users has been completely replaced by the concept of urban mobility. Considering the principles of mobile design such as mobility, flexibility, light and multifunctionality, the study highlights the fact that spaces are reshaped: between mobility and place, the mobility of materials, mobility, urban nomads and changing housing habits in today's architecture.

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A DESIGN PROPOSAL FOR HALIÇ COASTAL LANDSCAPE; EMPLOYING THE URBAN MEMORY TO TRANSFORM ITS WATER ECOLOGY

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ABSTRACT

Haliç is a unique estuary in the ancient city of Istanbul with its diverse geography that was formed with thousands of years of natural processes. This natural port was shaped through its rivers and native flora that emerged with the climate and topography of its ancient habitation; it established a gravitational point where historical, archaeological, ecological, industrial, cultural and architectural layers are intertwined by creating a microcosm that reconciles people, water, nature, goods, and stories in a multitude of scales ranging from local to global. However, 20th century urban zoning decisions and industrialization of this ancient port not only caused water contamination that deteriorated its environmental landscape and its natural habitat, but also created a coastal urban fabric disconnected from its fundamental originator: 'water'. This study is a presentation of a research project which was awarded in the Haliç Shoreline Urban Design Competition in 2020. The research regards the site as a peerless artifact and aims to devise an adaptable urban framework inclusively transforming and evolving with the city in symbiosis with Haliç waters.

Method of this study relies on research by design while the main structure of the investigation was conducted through a detailed scrutinization of gravures, ancient drawings, paintings, maps, reviews of related literature, travel books, narrations such as poems, tales, and legends. Urban and regional approaches and analysis were researched through a cartographic mapping process to discover and unfold the complex relationships of water and the city, whereas, infographics and collages inspired from historic miniatures were also employed to empower and converse Haliç's legacy of water for future formations.

Unearthing the neglected urban morphology of this Byzantine later Ottoman port city, the research investigates and proposes possible scenarios formed on/around Haliç that foster the connection of the land and water; enhance the conversation between natural and human spheres; attempt to recover and recuperate its water ecologies; and probe the impact of climate change as well as the water level change at the intersection of socio-ecological, socio-cultural, socio-political and socio-spatial encounters of the 21st century.

Key Words: Research by design, Urban memory, Water ecology, Public Space, Coastal city

1. INTRODUCTION

Oscillating between the land and water, socio-cultural and socio-ecological, historic and contemporary as well as the natural and human spheres, Haliç is a unique estuary conceived through thousands of years of natural processes forging the origins of the ancient city of Istanbul. Devised by its streams, climate and the native flora, this natural port emerged as a protective topography while its diverse topology established a gravitational point where historical, archaeological, ecological, industrial, cultural and architectural layers are intertwined, creating a microcosm that reconciled people, water, nature, goods, and stories in a multitude of scales ranging from local to global. Istanbul is a city derived from the sea (Kuban, 1996) and Haliç with its aquatic territory constitute the inception of Istanbul's ancient habitation. As the central core of the capital city of three empires, Haliç hosted and united the narratives of different civilizations; adopted various identities throughout the history; acted as a trade port, a safe shelter, a cosmopolite hub, an articulation node in global transportation, a productive aquatic resource, a recreational coast of festivity, a defense line, a diverse space of encounters amongst many others. It has been constantly transformed and reconfigured yet its dynamism and outstanding permanence endured time to convey the collective experiences within a continuity. However, the 20th century urban zoning decisions and industrialization of this ancient port generated a disruptive effect on the cohesive succession and progress of Haliç's transformation; the rapid installation of the immense industrial complexes not only caused water contamination that deteriorated its environmental landscape and its natural habitat, but also created a coastal urban fabric and an everyday city life disconnected from its fundamental originator: 'water'.

Regarding Haliç as a peerless artifact, this study aims to investigate alternative future scenarios that can potentially restore and recuperate the human and natural spheres of Haliç, and presents a research-by-design project which was awarded in the Haliç Shoreline Urban Design Competition organized by Istanbul Metropolitan Municipality in 2020. The paper will firstly introduce the methodology of the conducted research to set the contextual course of the process; and will continue by deciphering the results of the investigations and their impact on the design proposal. The focus of this quest is to discover approaches that spatial design can facilitate in order to elicit conversations between land and water, the individual and the collective as well as the past and the future while augmenting socio-ecological encounters to devise an adaptable urban framework, inclusively transforming and evolving with the city in symbiosis with Haliç waters.

2. METHODOLOGY

This paper was constructed through a National Design Competition held by the Istanbul Municipality, and Department of Parks and Gardens in 2020. The structure of the design presents the research background of the first area, second prize nominee of the competition "Haliç Shoreline Urban Design Competition". The study follows research by design method and pursues detailed steps of readings, discoveries that result as findings, and eventually design outcomes. The developed Design Proposal takes Haliç Estuary, the historical water canal of Istanbul, as the study area and focuses on Eminönü District as a prototype application site.

Although the study conducts a holistic environmental reading and understanding of Haliç with thorough explorations on 1:20.000 scale maps of the entire delta, the research then concentrates on the portion stretches in between Eminonu and Fener. Defined as the 1st region, the site boundaries were designated by the competition organization and assigned to different teams. The study opportunistically utilized this multi-scalar approach to test the resilience of the framework and develop a material practice revealing the living atmospheres and mutant landscapes of Haliç.

The method of this study primarily relies on research-by-design while the main structure of the investigation was conducted through a meticulous examination of historical resources, reviews of related literature, travel books, gravures, ancient drawings, paintings, miniatures, newspaper archives, meteorological data archives, native flora catalogues, water infrastructure plans, water quality reports, native fauna species, conurbation plans, registered buildings survey drawings, narrations such as urban legends, poems and tales, as well as historic maps and cartographic sources such as Goad Maps (1904-06) and Pervititch Fire Insurance Maps (1940-41). Also, Base Map, Infrastructure Map, Transportation Map, Registered Buildings And Structures Map, Development Plan, Property Map, Geological Situation Map, Cultural and Natural Properties Inventory, Vegetation Inventory, Bathymetry Map, were retrieved from Competition Advisory Board in cooperation with Department of Parks and Gardens of Istanbul, Department of Planning, Management of Maritime Transportation Services, General Directorate of Highways, and Istanbul Municipality. These materials supported mapping Transportation Network, Green Infrastructure, and Water Infrastructure of Haliç and Eminönü. Yet, the research used orthophotos and aerial photos of the study area for general observations, the overall analysis of current land uses, and landscape assessments.

Aiming to translate this complex set of data within the spatial structure of the study area, a cartographic data analyses process through mapping/map-making was inherently conducted throughout the entire research and design to read, search, find, interpret, discover and unfold complex and latent forces of the urban construct. In order to frame the research findings systematically, several subcategories have been formed and mappings assembled in various layers which helped depict and intervene the manifold to carefully manage the facts of the situation (Weller, 2001).

The discoveries of the urban and regional investigations provided the foundations for the design proposal which focused on promoting systems of negotiation and reconciliation between the water and the city, that are responsive, adaptable, non-linear and ecologic. While an overall urban framework was produced to generate a cohesive connection between all urban layers, the

coastal band was the focal area of the study and was transformed as a vibrant eco-recreational interface between the water and the city. Masterplan, plans, sections, diagrams were exercised to create the spatial construct of the proposal, whereas, infographics and collages inspired from historic miniatures were also employed to empower and converse Haliç's legacy of water for future formations. Findings and results of these discoveries shaped the main strategy of the design and provided opportunities for employing the urban memory and transforming its water ecologies to a design proposal. Eventually, infographics and collages inspired by historic miniatures also empowered and conversed Haliç's legacy of water for future formations.

3. MULTI-LAYERED FINDINGS, INTERPRETATIONS and PROPOSALS

3.1. GREEN and WATER INFRASTRUCTURE

Contemporary research of urban design and planning studies caused a fast and ubiquitous spread of the term "Green Infrastructure" where a definition of the meaning emerged as a general agreement (Seiwert, & Rösler, 2020). However, some core meanings were repeated frequently underlining the core function of ecological perspective over connectivity, multifunctionality, and spatial provision of ecosystem services (Seiwert, and Rösler, 2020; Wright, 2011; Hansen and Pauleit, 2014; Benedict and McMahon, 2006). Even though the urban landscape presents diverse and complex layers of these services, yet the study elaborated on these components under the "Green Infrastructure" concept where infrastructure refers to a conscious analogy with energy supplies, transportation networks, and residential constructions representing a hard infrastructure. The notion emphasizes the importance of integrated approaches for ecological principles, policies and economic limitations. Therefore, the study adopted this concept to compound a research design while ecological and social components of the urban landscape have been scrutinized through this notion.

Detailed investigations of historical data and current situation analysis revealed a set of materials for discussing solutions to current infrastructural problems and discovering opportunities for new design solutions. Considering Haliç estuary as the major driving force of the landscape mosaic, the water quality of the canal is considered an important problem. Research and literature about the water quality of Haliç revealed that the soil condition of the estuary bank is a critical challenge for creating a habitable environment for water habitats (Müftüoğlu, 2008).

In the sake of water purification strategies, a long-term bank soil plan was developed to rehabilitate the river bank and its surrounding land uses. The preliminary assessments revealed that the industrial uses adjacent to the water canal and near the Alibey and Kağıthane rivers, which feed and form the Haliç estuary, are the main initiators of vegetation loss, soil erosion and decrease in the water quality for over 50 years. In addition, according to the research, Haliç water contains Cd, Cr, Cu, Pb, Zn heavy metals in its context. The long-term soil plan suggests creating a vegetated riparian corridor where the vegetation avoids any erosion into the river bank and provides a natural water filtration system while creating a livable water habitat. In the short term soil plan, a phytostabilization method was suggested to isolate the water from heavy metals and pollution (Eroğlu, 2012).

The Alibey river corridor constitutes an important extension of Haliç. Therefore, the mining sites around these valuable water networks are considered as a threat to ecological integrity, and a rehabilitation process was suggested through natural succession in the area. Also, the vacant lots in the urban context and the suitable lands in the study area are transformed into permeable surfaces where native urban trees are implemented as a part of planting strategy. The coastal landscape, and fill areas are strengthened and rehabilitated for any erosion or liquefaction.

Figure 1. Green Infrastructure

Water, as the initiator of landscape forms, terrains, and ecosystems, not only shapes the physical environments but also promotes social movements, anthropologic traces, and public behaviors. As in Haliç's case, many cities host water bodies in their urban complex. These urban landscapes contain a heterogeneous, multilayered ecology platform, where natural processes and social activities interact in a continuously evolving spatial mosaic. In this complex association, water, plants, wind, people, animals, and materials move through these spatial patterns of all regions (Forman, 1995). This study revealed a contemporary design approach for exploring the potentials of water ecologies within a collaboration of urban memory and landscape ecology.

The main landscape ecology principles shaped the strategy development of the design decisions. The area was elaborated under the "patch-corridor-matrix" model (Forman, 1995; Forman & Godron, 1986) and the landscape components such as water, soil, vegetation, and artificial surfaces were classified according to their role in landscape connectivity and function.

Based on the model, the compositional and configurational distribution of these landscape components are formed. The detected valuable landscape resources such as water structure, large vegetation clusters and productive lands constituted the environmental patches while corridors are classified under inland corridors (water corridors), Infrastructural Recreation Corridors (transportation), and Digital interface corridors.

Specifically, the vegetated patches and corridors supported the CO2 emissions and increased the air quality while the inland corridors provide spaces for wind circulation in the urban context. Also, the suggested urban plantations are expected to decrease the atmospheric dust concentration by %25 (Clauston,1984). Also, these patches are critical core habitats for urban wildlife and fauna while the study area is located on the immigration route of Egyptian vulture, and White stork species and the area hosts 35 bird species with a variety of fish species.

The mappings and assessments discovered a critical absence of stormwater management in the area. Therefore a wide network of bioswales is proposed as inland corridors collecting rainwater and discharging them to the Haliç estuary. The extra rainwater fall will be stored in suggested aquifer spots for re-use to irrigate the public green spaces.

As another water strategy, Alibey and Kağıthane rivers are valued as the major ecological corridors in the landscape matrix. The researchers underline that the annual flow rates of these rivers are equal to daily flow rates of previous years (3x105 m3) (Müftüoğlu, 2003). A photodegradation method is suggested to filter the rainwater for these riparian corridors.

Finally, the water management part of the green infrastructure plan proposes a strategy for cleaning the surface pollution on Haliç with floating drones. The collected pollutants will be exhibited in the coastal park to create public awareness. Also, hydroelectric systems are suggested in the potential areas around Galata Bridge and Sarayburnu where the water flow is faster.

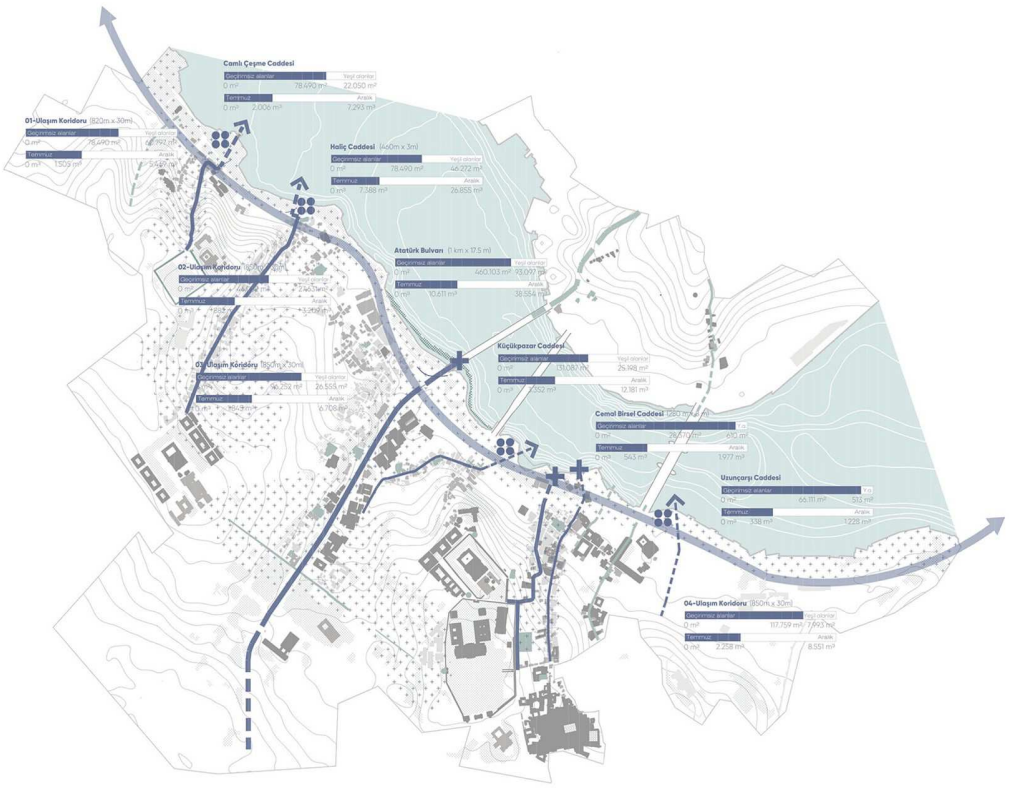

Figure 2. Water infrastructure

3.2. URBAN MORPHOLOGY / HISTORIC URBAN FABRIC

The historical peninsula has been the capital of three empires accommodating rich and diverse cultures thanks to its role as an important transit node on the global trade route for centuries. Haliç shores had been the main generator of urban life and city economy from the Byzantine period to the 1950s. Its urban pattern consisted of narrow streets and dense urban fabric constituted a rich ground for intense social and economic activities constantly revolving a life around water. With its indented-protruding coasts, Haliç served as a natural shelter for the inner port in the city offering a convenient geographical location for traditional trade activities from the sea.

Acting as an entrance gate, the study area morphologically follows the traditional spatial organization of a port economy and can be easily accessed from Bosphorus and Galata. The coastline within this trade landscape served as a buffer zone between the people/products coming from the sea and the land areas, with shops, workshops and warehouses where products that meet the needs of Istanbul are stored for centuries since the Byzantine period. (Müller-Wiener, 1998: 37)

Because of its underlying condition as an area full of historic landmarks and protected structures, the historical architecture and the remnants are inherent to the overall urban fabric. The trade infrastructure of the port within this peerless geography posits a unique urban morphology and spatial organization, that the study investigates through all the different layers to constitute a cohesive, integrated, recuperated and fully functioning modern urban environment. To achieve this purpose, the study researched and reviewed plans of registered structures, landmarks/edifices, literature explaining the previous historic states of the area, historic maps and descriptive memoirs. As the findings were cartographically mapped, the neglected morphology that the city historically depended on became more apparent.

The spatial traces of the traditional commercial landscape of Istanbul evolved over the "street - gate – pier/port" scheme, which is still evident today, formed the relationship between water and land with its easy and perceptible spatial setup. Significant urban landmarks and symbolic structures located in the close vicinity of the project area demonstrate the harmonious pattern of urban texture extending from the inland until the sea, and constitute the remnants of this land-water relationship. The "street - gate – pier/port" urban morphology of Haliç is still legible thanks to these artifacts. Etymologically, in Latin, the word port derives from the word "porta" which means door. This connection proves a strong bond in between the densely crowded boats arriving in front of the piers of Haliç, and the following trail that leads them through the city gates, to the shops and warehouses located in the back. "If we refer to the word etymologically, it might sound like a simple pun on the Latin origin of the term, portus, -us, meaning harbor, shelter, but it derives originally from the word port, -ae, (street, gate, pier/port)". (Eldem, 2012: 168)

While the inland portion of this urban morphology, the streets, embolos or Via Pubblica (Ağır, 2009) is still legible today and function as urban connectors within the districts, the coastal portion of this framework has disappeared due to the installations of 20th century industrialization and later their removal, leaving disconnected and fragmented vast vacant waterfront areas on the shores of Haliç.

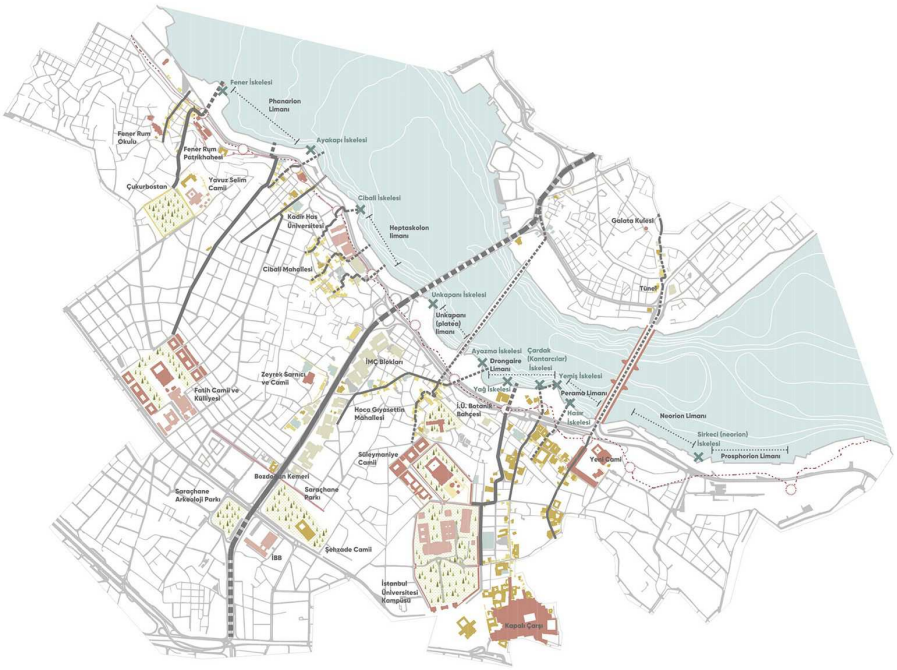

Figure 3. Urban morphology / Historic urban fabric

3.3. TRANSPORTATION NETWORK / INFRASTRUCTURE

With its dense population and active commercial touristic programs, Haliç, has been one of the most vibrant areas of Istanbul throughout the history and the current times. As a transition area linking some of the most characteristic focal points of Istanbul, Haliç has served as the most important transportation hub of the city since its initiation, and today it still operates with the same function congregating different mediums of transportation such as metro, light rail system, land and sea transportation. The investigation area, where the two shores of Haliç are closest to each other, has undertaken the role of providing the busiest transit between the two coasts for centuries. Currently the area has multiplied its prominence in the urban transportation network of the city; first as a main intersection point within the overall transportation network, and second, as the main connector in between the two shores of Haliç.

While the diversity and efficiency of the alternative transportation modes constitute one of the strengths of the area, the lack of spatial organization of land use reveal a number of patch/fragmented transport solutions that create a chaotic complexity in the urban space escalating inaccessibility.

The study employed detailed examinations of transportation statistical data of Istanbul Metropolitan Municipality, urban infrastructural plans, approved master plans, web mapping service data, and satellite imagery in order to decipher the problems and the potentials of the transportation infrastructure of the area.

The conducted research identifies and maps a series of dysfunctional spaces; open areas areas as parking lots; recreational boat mooring areas that disrupt coastal continuity and prevent access to the sea; unstable vehicle and pedestrian transport rendering walking difficult and creating dangerous areas for pedestrians; tour buses parked along Ragıp Gümüşpala Street, pedestrian routes resolved with underpasses. All these examples show that the transportation and access layers in the project area do not work holistically and require cohesive planning within the 21st century mobility ideals.

As a result of the investigation and cartographic study, a number of interventions are proposed to enhance the transportation networks of the city.

Due to the unique geography of Haliç the primary focus has been on water transportation. Although Haliç is established and located around the water, the area fails to operate the sea transportation systems efficiently; these systems especially constitute the shortest and fastest transportation option linking the two shores. In order to take advantage of this latent potential, the proposal removes the private boat mooring spaces along the shore, and offers a strategic transportation plan to revive the neglected historical piers of Haliç and to introduce them within the urban water transportation system, increasing the role of the maritime transportation in the overall transportation network of Istanbul.

On the other hand, with the latest constructed transportation lines since the beginning of the 21st century, the historical peninsula has become a center where a vast amount of transportation routes converge. However, due to the current master plan decisions rendering the arteries of the area as transitional motorways, the district still is heavily under the pressure of the immense vehicle load of Istanbul. The ongoing pedestrianization projects have demonstrated a significant role in reducing air pollution (Karaca, 2015) and increasing life quality in the central zones. The employed method here; the traffic evaporation phenomenon (Reclaiming city streets for people — Chaos or quality of life?, 2004), derives from the strategic removal of vehicle space in the existing urban networks discouraging car use and abiding new methods of transportation such us bikes, public transportation and pedestrianization. The design proposal for the area adopted and augmented this concept of traffic evaporation to reduce the vehicle flow and prevent dense congestion points in the region by implementing strategies that will drastically reduce and limit the daily number of vehicles entering the Historic Peninsula. The design also proposed policies to be implemented to slow down, discourage and limit private vehicle traffic throughout Haliç, thus, the efficiency of the public transport systems can be increased by developing an integrated public transport system.

Located at the entrance of Haliç, Eminönü Square is exposed to vehicle and pedestrian traffic from almost every part of Istanbul. Considering the current regulations, this dense urban area gives priority to motorized vehicles and it functions as a large bus terminal. The Sirkeci coastline connecting Eminönü Square to Sarayburnu also has heavy pedestrian flow, where above ground vehicle traffic causes pedestrians to move through congested underground passages to access the shoreline. Within this context, it is proposed that the dock between Eminönü square - Sirkeci - Sarayburnu is supported by stepping stones to ensure the continuity of the green system and emphasize pedestrian transportation. Bus stops in Eminönü Square are removed; and strategic proposal plans are established to create a rotation ring for busses while the vehicle roads are taken below ground to generate a continuous above ground pedestrian access to the shore.

As a vital infrastructure within the whole network, Galata Bridge is not only a unique heritage but a robust generator in the daily urban life of Istanbul. Its programs, wide range of users, unique geographic location between Bosphorus and Haliç, views towards almost every direction of central Istanbul, and historical function are intrinsic values to Istanbul and its citizens. The proposal aims to enrich the pedestrian experience on the bridge to eliminate the accessibility problems created by the vehicle traffic at the Eminönü intersection by closing the bridge to road traffic and offering alternate directions within the traffic evaporation strategy. Through the implementation of this proposal, the bridge will recuperate the intense damage suffered over years of vehicle use, and will recover as a pedestrian friendly social corridor connecting the landmarks around Haliç shores.

The design also proposed the use of electric land and sea public transportation vehicles to reduce carbon emission rates and develop sustainable solutions with a wide impact on the fight against climate change.

Figure 4. Transportation network / Infrastructure

3.4. URBAN MEMORY

Space is socially constructed, as Henri Lefebvre brilliantly asserted in his book “The production of space”. (Lefebvre, 1974) Subsequently, one of the most important conditions for a comprehensive study of a city is its urban memory; particularly, the spatial continuity that constitutes this memory. Within this context, the existing mutual relationship in between the user and the space allows us to discover intrinsic aspects, values and characteristics that trigger a deeper understanding of a place. Oral and written history are structural foundations that reveal potential weaknesses/strengths of the urban environment, therefore, looking through the glass of present and past users sustains a cohesive urban memory that will generate a sense of belonging for the future users. Strengthening the collective memory based on oral and written historic experiences reinforces the sense of belonging of the users within their contexts, this phenomenon becomes even more substantial where this spatial continuity is broken.

Place attachment and successive stories are inherent to the success of any urban intervention, on the other hand, surgical rapid urban transformations are progressively detaching the users from their cumulative urban narratives creating programmatically unintelligible spaces. Enhancing the collective memory based on historic experiences can repair this spatial discontinuity, to achieve that, this study runs an empirical investigation, though data collection, in which historical maps, city plans, reviews of related literature, urban legends, tales, historic newspapers articles and etymological studies are scrutinized.

As a port city area, Haliç is one of the main prominent nodes of Istanbul where commercial and social activities are connected to the outside world. People, products, and stories transition in a multilayered cosmopolitan area that encourages diversity and embraces it as part of its own. These customs, cultures and stories associate with others and become detailed settling in the city. Common habits, thoughts, images, life styles arising from the diverse urban narratives are experienced, accumulated, multiplied, stored and reproduced. Thus, it becomes impossible to detach the city from its historical context. With its artifacts the city records the historical process and relates its traces of daily life in layers. Haliç, as one of the most densely and most populated regions of Istanbul, has a multi-layered past that documents the history and creates a collective urban memory on the coast, on/around the water and the inland. The study area systematically conveys the historical continuity of the city of Istanbul since ancient times to the present day, especially, the continuity of the city is hypothetically dependent on the "human" factor despite the changing structure of the urban population.

Figure 5. Urban memory

As a result of the research the findings and discoveries of the past stories guided the design decisions for future proposals. To begin, it was noted that Galata Bridge initially was as a pedestrian link, and a prominent connection in between Eminonu and Beyoglu, the entire area thrived as a socio-cultural hub due to the absence of vehicle mobility. This finding affected transportation decisions of the proposal centering them around primarily a pedestrian mobility. In addition, Balikpazari area, similarly affected by the vehicle infrastructure, was a vibrant commercial hub filled with restaurants, shops, small piers, fisherman and a fish market which etymologically where its name derived. The design reactivated the past programs, creating a newly revitalized commercial node around water. Furthermore, as a flour production area during the Byzantine and Ottoman period, Unkapani neighborhood hosted a fully functioning flour factory that coexisted with a hospice until the 20th century. Aiming to recover and restore the abandoned flour factory, the design proposed a blooming public hub to create a socially responsible open community kitchen. Finally, one of the other discoveries revealed possible transformations for Cukurbostan. Built initially as a roman water storage infrastructure, Cukurbostan served as a productive urban agriculture area during the Ottoman period due to the accumulated algae within the depth of the basin and later in its soils. Our proposal aimed to uncover the history of this artifact with a proposed archaeological park which also performatively acts as a permeable area for rainwater collection and a green productive area for the neighborhood.

All research layers were thoroughly examined, blended, programmatically adapted to create a physical, social and also a digital interface keeping the collective urban memory alive and open to new layers to come.

3.5. COMMON HABITAT STAKEHOLDERS

In order to create a pluralistic public sphere and to encourage the public to harness collectivity as well as to develop participatory mechanisms, readings and examination of the users and the stakeholders are crucial steps within the overall research process. To gather an understanding of the common habitat stakeholders of Haliç 1st region, the study examined land use surveys of Istanbul Metropolitan Municipality as well as demographic data analysis of district registries.

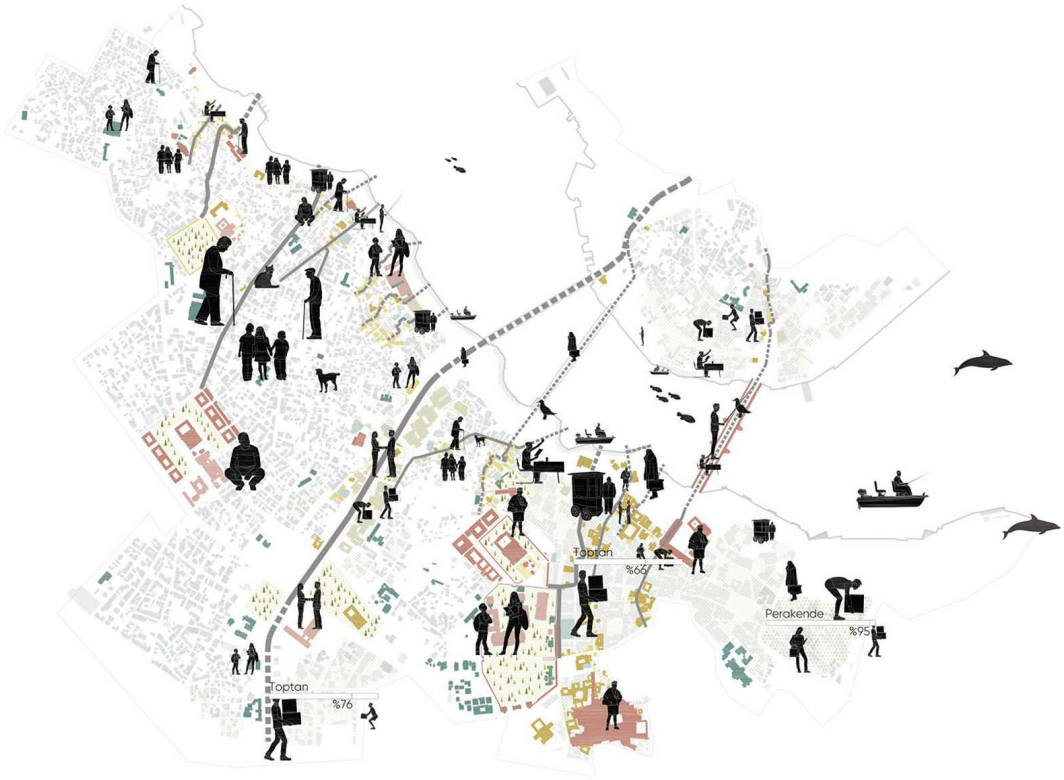

Figure 6. Common habitat stakeholders

As a result, the main actors of the area are found as follows:

Residents: In the historical peninsula, districts such as Zeyrek, Fener and Balat are areas where the neighborhood texture is preserved, while districts such as Küçükpazar, Hoca Gıyasettin neighborhood have a relatively introverted structure. Local residents benefit from the various transport networks in the area, as well as use the living quarters and nearby educational facilities.

Traditional production & tradesmen: Tradesmen are concentrated in the narrow and organic streets of the peninsula, especially around Eminönü and Tahtakale. These users constitute a large population in the area during the day and attract users from many districts and profiles to the region.

Large manufacturers / wholesale traders: Eminönü is home to a significant number of manufacturers who produce goods for the wholesale market in large workshops and stock them in large warehouses also within the district.

Fishermen: Stretching from Galata Bridge along the Haliç coast, fishermen establish one of the main characters of the area. In addition, commercial fish activities such as fish & bread have rooted traditions over the population.

Public employees: Employees of public institutions throughout the peninsula also have a large population in the vicinity. They are concentrated in public spaces and public transportation stops nearby public institutions.

Tourists: The tourist population, who generally prefers to stay in hotels in the historical peninsula, concentrates around historical and cultural venues in Istanbul. Tourists are provided with sea and land tours along Haliç coastline.

Street vendors: The simit bread vendors and street sellers are part of Istanbul's character and will continue their presence in Eminönü.

Consumers: Consumers coming from neighboring districts to the area, especially by visiting the bazaars and Eminönü tradesmen, provide an economic cycle. They constitute a very crowded local tourist population for the area.

4. OVERALL DESIGN PROPOSAL AS THE RESULT OF CONDUCTED RESEARCH

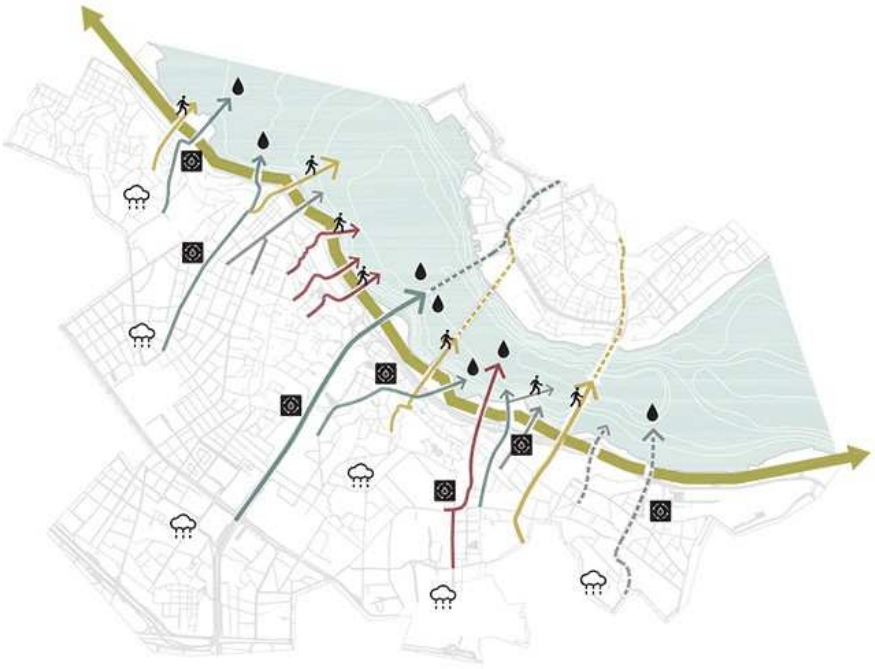

Figure 7. Urban framework based on the historic “street-gate-pier/port” structure

Establishing a design proposal based on the interpretations of multi-layered cartographic analyses, the research discovers that the main urban framework/ spatial organization of “street-gate-pier/port” structure not only still legible within the contemporary urban fabric but also, is the main operational infrastructure in which all layers of Haliç (transportation, ecological, urban memory or land use) are integrally converged. The streets leading to the old gates or piers are still the main *embolos* embodying the dynamic life of the city; and they still are the main channels conveying the rainwater as well as the winds of Istanbul. However, the surgical interventions of the 20th century industrialization detached and segregated the coastal portion of this spatial organization leaving an undefined, disconnected and fragmented shoreline fabric. Unearthing the neglected urban morphology of this Byzantine later Ottoman port city, the design proposal repairs and reactivates the “street-gate-pier/port” framework to induce possible scenarios formed on/around Haliç that foster the connection of the land and water; enhance the conversation between natural and human spheres; attempt to recover and recuperate its water ecologies; and probe the impact of climate change as well as the water level change at the intersection of socio-ecological, socio-cultural, socio-political and socio-spatial encounters of the 21st century.

4.1. MORPHOLOGICAL TRANSFORMATION: FROM TRADE / INDUSTRIAL PORT TO COMMON HABITAT PORT

In order to adapt the " street-gate-pier/port " spatial structure, the study aims to analyze the physical and functional transformation of urban artifacts and to interpret the missing and erased portions of this spatial pattern within the scope of the project. According to this analyses:

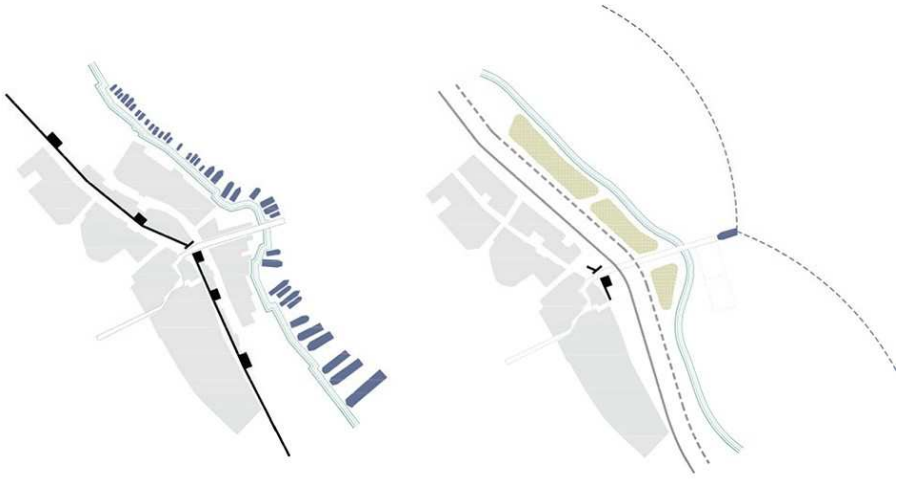

Figure 8. Transformation from trade / industrial port to common habitat port

City Walls:

Constituting a border between the land and the water, the city walls were the main defense structures and also macro-scale urban infrastructures of historic Istanbul. Although now disappeared, the remaining elongated band of the walls still function as a macro-scale urban infrastructure separating land and water by hosting the vehicle road and planned T5 Eminönü - Alibeyköy tram line.

Gate, Street:

Penetrating the city walls, the gates allowed access from the inland streets-*embolos*- to the shoreline piers and ports. While these streets are still active components of the city and topologically expand from the inland to the coast, the pedestrian access to the waterfront is obstructed due to prioritization of vehicle traffic.

Hangar/warehouse:

The hangars and warehouses of the trade port and later the industrial port operated as the programmatic volumes where products were loaded, stored, produced or sold. The remaining spaces and structures of these hangars carry the potential to be reactivated with public recreational programs providing closed or semi-closed areas.

Pier and Port:

Historically, each district and neighborhood of Haliç were equipped with commercial and transport piers with lengths differing between 31-60 cubits -*approximately 15-30 meters.* (Müller-Wiener, 1998: 24) Today, very few of these piers still remain and the frequency of their use decay due to the increase in motorized vehicle ownership and masterplan decisions of the city. The revitalization and reproduction of the historical piers of Haliç will be inherent in developing alternative access modes to the area by increasing the share of sea transportation in the overall network. In addition, the piers will function as interfaces to encourage the diversity of activities and programs on the shore as well as the experience of connection with water to facilitate a lively and robust coast for all Istanbul.

4.2. STRATEGIC FRAMEWORK of the COMMON HABITAT PORT

Aiming to restore and reactivate the water-land connection of Haliç, the design reproduces this characteristic spatial mechanism of " street-gate-pier/port " and strategically converts it into an open and participatory framework at the intersection of the individual and the collective; a dynamic, adaptive and reactive spatial system that operates through organization, legibility and directionality while allowing utmost flexibility for spontaneous, self-generated experiences emerged through the conversations of water and city. While inland eco-corridors of this framework revitalizes the *embolos* to devise connections from the inland to the sea, and from the sea towards the inland, the infrastructural re-creation corridor generates a coastal spine uniting all inland arteries. And lastly, uniting all layers of the framework for evolutionary development of Haliç with the city, digital interface corridor as an augmented environment of user interaction and data is designed to encourage citizen engagement and improvisation to amplify the experience of participatory public life.

Inland Eco-Corridors:

Devised with the ability to adapt to the needs of the districts and users, the inland eco-corridors are designed as routes to the water where the land-water relationship can be experienced with various programs. While each one is planned to be reference, gathering and meeting arteries along the shore, each contact point of the corridors with the water is developed as recreative and infrastructural piers that support and encourage the use of open spaces for all envisaged activities.

Besides acting as main arteries carrying user circulation in between the land and water, these corridors also act as main ecological conveyors and discharge axes of rainwater through the integrally designed bioswale routes filtering and feeding the waters of Haliç.

On the water contact points of these corridors, the proposal aims to reactivate the historic piers and introduce "floating piers" as an alternative system to adjust and respond to the needs of each corridor by accompanying different programs on these adaptable piers. As fast, light-structured and economical solutions, these floating piers are also equipped with ecological filtration components at the bottom of their structures and thus, help to restore the damaged underwater ecosystem of Haliç.

Infrastructural Re-creation Corridor:

Running parallel to the shore, the infrastructural re-creation corridor establishes the main backbone connection of all inland eco-corridors and provides the macro scale continuity of transport systems within the city network. While the proposal aims to encourage vehicle-free alternative modes of transportation through the exploitation of diverse public transport options and transfer points, it increases pedestrian permeability of the vehicle road to ensure the integrity of the city-coast relationship.

Digital Interface Corridor:

As a responsive and communicative virtual ecosystem, the digital interface corridor is proposed to augment user interaction, where static and dynamic components and actors are associated holistically, triggering a robust public space that evolves with the society over time and ensuring the multiplication of future layers of Haliç. With its informative and interactive layers offering data sets from public transportation information to event calendars; from tracking Haliç ecological data to floating platform location information / suggestions; the digital communication framework for Haliç is not an attempt to use technology for technology's sake, rather it is to consolidate more empirically-based human-centered design aiming to achieve democratic, transparent and participatory decision-making processes.

5. CONCLUSIONS

The multi-layered readings and interpretations through cartographic studies enabled to discover the dormant and latent forces within the urban fabric of Haliç while revealing the intertwined connections of both apparent and overlooked components of its morphology, topology, ecology, history, geography, legacy, economy, and sociology. Its historic infrastructural organization and urban memory shed light to discover its water originated human and natural ecology; reminding Waldheim's masterly argued phrase "Infrastructure as a means to reconciling architecture's contemporary potential with its historic relationship to the city." (Waldheim, 2011, p.4)

The continuity of public space within the city is directly linked to its ability to endure through time and become the common heritage of successive generations. Such sphere of "public-ness" transpires and transcends the ephemerality of those who inhabit it; it constitutes a lasting/stable ground that allows for human remembrance and anticipation both as cumulative memory and as a measure of trust in the future. The multi-layered identity of Haliç, with its unique relation to water is a source of inspiration for the future, enables an ever-changing cultural landscape, a dynamic and symbolic space of reconciliation, and a pluralistic eco-project that inclusively evolves with the city.

Haliç's water transpires spaces of constant transformation yet of outstanding permanence that are common to all, centering the focal philosophy of the design and research for Haliç on Arendt's approach:

"The common world transcends our lifespan into past and future alike; it was there before we came and will outlast our brief sojourn in it. It is what we have in common not only with those who live with us, but also with those who were here before and with those who will come after us." (Arendt, 1958, p.55)

ACKNOWLEDGEMENTS

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METHODS OF ARSENIC REMOVAL FROM CONTAMINATED GROUNDWATER WITH SPECIAL REFERENCE TO NANOMATERIAL APPLICATION

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ABSTRACT

Arsenic (As) is a metalloid of great environmental concern because of its highly toxic nature and colossal abundance. Several researchers are focused to develop suitable materials which can remove arsenic effectively from water. Nano-materials have gained special attention for arsenic treatment since last decade because the materials of such kind have unique properties than the bulk materials. Like different nano-materials, single and multi-metal or doped metal oxides are also subject of much interest since that materials have high surface-to-volume ratio, enhanced magnetic property, special catalytic properties, etc. Different methods like chemical precipitation, sol–gel, vapor deposition, solvo thermal, solid state reaction, etc., were adopted for the synthesis of specified oxides by various researchers. Among them, the chemical precipitation method is very simple, easy to handle, cheap, and mostly green technique. Synthetic single and mixed metal oxides had been studied extensively for removal of arsenic since they usually have very strong arsenic adsorption capacity. Desorption studies showed that NaOH, KOH were effective in regenerating the adsorbents from these nanomaterials. Graphene based materials usually show very high surface area due to their open structure and thus are very effective in arsenic removal from contaminated water. However most of techniques for the treatment of wastewater involving nanotechnology so far have only been investigated in laboratory scale and not all of them are likely to be feasible alternatives for existing treatment technologies mainly due to economic reasons. The environmental fate and toxicity of different nanomaterials are also areas of concern in material selection and design for arsenic remediation.

Key Words*:* Arsenic; Nanomaterials; Water treatment; Sorption; Composites.

INTRODUCTION

Arsenic is a metalloid which has detrimental effects on human health and ecosystems. Arsenic has been used in human society since ancient period and many people have died and sickened by its application. Arsenic still remains a part of our daily lives and millions of people are being exposed to arsenic through food, air, water, and soils (Mondal and Suzuki, 2002). Arsenic ranks 20th in abundance in the earth's crust, 14th in the seawater and 12th in the human body (Mondal and Suzuki, 2002). Arsenic naturally occurs in over 200 different mineral forms (60% arsenates; 20% sulfides and sulfosalts; 20% arsenides, arsenites, oxides, silicates and elemental arsenic) (Bissen and Frimmel, 2003; Bhattacharya et al., 2012). The main pathways of arsenic exposure to the human beings include ingestion of contaminated drinking water, consumption of contaminated foodstuffs and inhalation of air. Arsenic contamination in groundwater has been reported in Bangladesh, India, China, Taiwan, Vietnam, USA, Argentina, Chile and Mexico (Bhattacharya et al., 2012). In many parts of these countries, the concentration has exceeded the permissible limit recommended by WHO (WHO, 2001). Groundwater is regularly used for agricultural and household purposes in the arsenic contaminated zones of the world. The use of arsenic-contaminated groundwater for irrigation purpose in crop fields can elevate arsenic concentration in surface soil and arsenic can be subsequently bioaccumulated in the food chain (Bhattacharya et al., 2012).

Various technologies have been implemented for arsenic removal from contaminated water, and the effectiveness of these technologies largely depends on the physical and chemical features of the arsenic compounds available in water (Ray and Shipley, 2015). Many researchers successfully removed arsenic from water by using metal, metal oxides, and mixed metal nanoparticles, as well as some commercially available and low-cost nanoparticle-impregnated adsorbents, nanotubes, and various nanocomposites (Ray and Shipley, 2015; Bhattacharya et al., 2013).

Nanoscience involves the study and understanding of materials on the nanoscale level between 1-100 nm (Rotello, 2003; Gregory, 2008). It also includes the study to control the formation of two and three- dimensional assemblies of molecular scale building blocks into well defined nanostructures or nanomaterials (Rosi and Mirkin, 2005). Nanoparticles (NPs) could be of two types: non-engineered and engineered. Engineered nanoparticles could be produced intentionally in the laboratory having size ranged in 1-100 nm. and properties quite different from the bulk material of similar composition (Auffan et al., 2009). NPs could be classified as carbon base materials such as carbon nanotubes (SWNT, MWNT), graphene, inorganic nanoparticles and polymer nanocomposites (Mauter and Elimelech, 2008). Inorganic nanoparticles include pure metal oxides, mixed metal oxides, pure metals and quantum dots (Shah and Ahmed, 2011; Savage and Diallo, 2005). These nanomaterials show different interesting morphologies such as spheres, tubes, rods, prisms, thin films, buds etc. Materials show several enhanced properties like catalytic, optical, electric, magnetic etc. in the nanoscale range (Roco and Brainbridge, 2001). These unusual and enhanced properties of nanomaterials have captured the attention of researchers all over the world. Government and Industrial sector are also showing their interest in this prospecting area of technology. Nanomaterials are used in different fields such as electronics, biomedicines, biosensors, pharmaceuticals, cosmetics, environmental analysis and remediation, catalysis, agriculture, optics, textiles, sports etc (Schmid, 2004).

Synthesis of nanomaterials is a challenging job. Several methods have been developed for the synthesis of size controlled, well defined nanomaterials (Shah and Ahmed, 2011; Savage and Diallo, 2005). Most of these methods produce nanomaterials in low yield. However modifications have been made by different researchers to increase the yield so that the materials could be utilized in practical field. Different characteristics such as large surface area, potential for self assembly, high specificity, very high reactivity and catalytic potential make nanoparticles excellent candidates to protect environment through pollution prevention, treatment and cleanup of long-term problems like hazardous wastes (Bhattacharya et al., 2013).

CONVENTIONAL ARSENIC REMOVAL TECHNOLOGIES

Various technologies have been applied to remove arsenic from drinking water under both laboratory and field conditions. Composition of arsenic-contaminated water is the major factor in arsenic removal (Singh et al., 2015). Most of the available removal technologies are more efficient for arsenate (As^{+5}), as arsenite (As^{+3}) is predominantly non-charged at pH below 9.2 (Johnston and Heijnen, 2015). This makes the trivalent form of arsenic less available for adsorption, precipitation and ion exchange. Commonly used techniques are (i) oxidation followed by precipitation, (ii) coagulation/electrocoagulation/co-precipitation, (iii) adsorption onto sorptive media, (iv) ion exchange and (v) membrane technique (Nicomel et al., 2016; Ghosh (Nath) et al., 2019).

Oxidation followed by precipitation

It is a relatively simple, low-cost, *in situ* arsenic removal process (Mohan and Pittman, 2007). For anoxic groundwater, oxidation is an important step since arsenite is the prevalent form of arsenic at near neutral pH. The oxidizing agents may be oxygen, ozone, free chlorine, hypochlorite, permanganate and Fenton's reagent (Nicomel et al., 2016; Mohan and Pittman, 2007). However, interfering substances present in water need to be considered in selecting the proper oxidant, as these substances can greatly affect and influence the As(III) kinetics. The oxidation process, particularly of drinking water, may be problematic due to chemical residue of oxidant, by-product formation from oxidation of the organic and inorganic matters present in water, and operational complication (efficient control of pH and oxidation step). Therefore, oxidants should be selected carefully to remove arsenic efficiently from a solution by oxidation (Nicomel et al., 2016).

Coagulation/ electro-coagulation/co-precipitation

A cost-effective approach for arsenic removal is coagulation and precipitation (chemical processes) followed by filtration (a physical process). Common coagulants used for arsenic are iron salts and aluminum sulfate (alum). Treatment of water using alum and ferric salts is effective to remove arsenic (Bissen and Frimmel, 2003). Both ferric and alum are effective in removing As(V) than As(III) over a wide range of pH. Removal efficiency is strongly dependent on the solution pH but not on the coagulant dosage or initial As(V) concentration. In case of As(III), the removal is independent of solution pH and strongly dependent on the coagulant dosage and As(III) concentration (Happer and Kingham, 1992). Ferric chloride was found to be most effective coagulant for the removal of arsenic from water. Though it is an efficient method for arsenic removal, yet this method suffers from the problem of sludge disposal and dose control in rural condition are extremely difficult. Additionally this method enhances total dissolved solid plus anions like chloride in treated water. Alum coagulation has also limitations like production of toxic sludge, low removal of arsenic and requirement of pre-oxidation (Mohan and Pittman, 2007).

Ion exchange

Ion exchange is a physicochemical process in which ions of the solid phase are exchanged with the equivalent number of ions from feed water (Paul and Sarkar, 2016). Ion exchange resins are cross linked polymer matrix to which charged functional groups (carboxylate, sulphonate, tertiary or quaternary amines) are attached by covalent bonding. Anion exchange resins are of two types, strong base and weak base, depending on the attached functional groups. Strong base anion exchange resins are effective over a wide range of pH where as weak base anion exchange resins are useful only in the acidic range. Water pH, arsenic concentration, resin type, other competing ions are some of the influential factors effecting the process of ion exchange (Paul and Sarkar, 2016). The metal-loaded resins have an edge over the other resins for selective removal of arsenate (Dambies, 2005). However, the technology has some limitations like high cost of resin, high-tech operation and maintenance, problem of sludge disposal and production of toxic wastes (Mohan and Pittman, 2007).

Membrane technique

Membrane techniques like reverse osmosis, ultra filtration, nano-filtration and electro dialysis are capable of removing dissolved contaminants including arsenic (Wiesner, 1993). In all cases, As(V) removal is more effective than As(III). RO and NF are very effective in removing As(V) with 91-99%efficiency but not so effective in removing As(III) with 20-55% removal efficiency. Membrane techniques have high removal efficiency and, no toxic solid wastes are produced in the process and all other contaminants present in water can be removed by this process. However the techniques are costly and time consuming for precondition (Mohan and Pittman, 2007).

Adsorption method

Adsorption technology has been extensively studied because of its advantages over other competing technologies. The adsorption technology is highly effective due to its high removal efficiency (more than 99.0% removal capacity is observed for many sorptive media). b) The operation process of adsorption is also easier and less time-consuming with lower recurring cost.A filter can be conveniently manufactured for household purposes, especially in the lower income countries (Bhattacharya et al., 2012).

In general, the removal of As by adsorption techniques depends on pH. As(V) removal is more efficient than As(III) at pH lower than 7 (Wilkie and Hering, 1996; Grafe et al., 2001; Zhu et al., 2013; Raven et al., 1998). The adsorption rate and capacity also depends on presence of other ions competing for the adsorption sites (e.g. phosphate, silicate, HCO_3 and Ca^{2+}) (Zhu et al., 2013; Kanematsu et al., 2013; Giles et al., 2011).

Adsorption by carbon: Different types of sorptive media, such as bio-materials, mineral oxides, activated carbon, and polymer resins, have been used for arsenic removal from water. Adsorption efficiency is found to be dependent on temperature, pH, ionic strength and activated carbon (Mohan and Pittman, 2007).

Adsorption by inorganic materials and biomaterials: Agricultural wastes and byproducts like rice husk were used recently for removal of aqueous arsenic (Amin et al., 2006; Asif and Chen, 2017). Different industrial wastes like chars and coals are reported to remove arsenic from contaminated water (Allen et al., 1997). As (III) removal capacity of chars were found to be in the order of: pine wood char < oak wood char < oak bark char < pine bark char (Mohan et al., 2007). Red mud has also been studied as an adsorbent for arsenic; As (III) removal was favourable in alkaline medium and As (V) removal efficiency increased in acidic pH (Altundoan et al., 2002; Wu et al., 2017). Several types of treated and coated sands were utilized and experimented for arsenic removal (Devikarani et al., 2006). Iron oxide coated sand was reported to be highly efficient in arsenic adsorption; Iron oxide coated sand modified by sulfate was capable of removing both As (V) at acidic pH and As (III) at neutral or slightly alkaline pH (Devi et al., 2014; Vaishya and Gupta, 2003). Natural and synthetic zeolites were reported to be effective for both As (III) and As (V) removal (Chutia et al., 2009; Khatamian et al., 2017). Calcium ion incorporated hydrous iron (III) oxide was found to be capable of removing more than 90% arsenite from solution; mechanism assessment revealed that the adsorption of arsenite occurs via chelation (Ghosh et al., 2019).

Adsorption by metal oxides: Metal oxides can be effective for both As (III) and As (V) removal from water (Violante et al., 2009; Min et al., 2009; Yamani et al., 2012; Wen et al., 2014). Manganese dioxide (MnO_2) was extensively studied for its potential to oxidize As (III). This process induces alternation of MnO_2 surface leading to larger adsorption site for As (V) (Wen et al., 2014; Manning et al., 2002). Both synthetic and commercially available titanium dioxide, because of its photocatalytic property, is capable of oxidizing As (III) to As (V) (Nicomel et al., 2015; Lata and Samadder, 2016). Different forms of iron

oxides including oxyhydroxide, hydroxide, goethite, and hematite demonstrated high removal efficiency for both As (III) and As (V) in aqueous solutions (Guo and Chen, 2005; Wang et al., 2015; Basu et al., 2015). Initial solution pH, contact time, initial arsenic loading, ionic strength of the medium and temperature also play a critical role in determining the efficiency of arsenic adsorption.

Adsorption by activated alumina: Arsenic adsorption on activated alumina (AA) has also in focus because of its extremely high surface area and its distribution of both micro- and macro-pores (Singh and Pant, 2004; Das et al., 2013). As (V) sorption is highly efficient between pH 6.0 and 8.0 where AA surfaces are positively charged. The AA surface modified by manganese oxide or by ferric hydroxide demonstrated better sorption capacity than that for pure AA (Maliyekkal et al., 2009; Lescano et al., 2015).
One of the major problems faced in the field by the above mentioned adsorption methods is the presence of high iron content in groundwater, which can clog the filter material and can reduce the life-time of the filter (AIIH, 2001).

APPLICATIONS OF NANOMATERIALS IN ARSENIC REMOVAL

Advantageous properties of nanomaterials: Nanoparticles (NPs) and nanocomposites have higher efficiency in arsenic removal compared to their micron-sized counterparts (Lata and Samadder, 2016). Nanoparticles have higher surface area per unit mass, in addition to their high specificity, high reactivity, and efficient catalytic potential, (Hristovski et al., 2007; Qu et al., 2013) which makes them useful for developing highly selective and efficient sorbents for removal of organic and inorganic pollutants from contaminated water (Mohan and Pittman, 2007; Bhattacharya et al., 2013; Nicomel et al., 2016).

Application of mixed oxide nanomaterials: Nano-agglomerates of mixed oxides such as iron-manganese, iron-titanium, iron-cerium, iron-zirconium, iron-chromium, and cerium-manganese have been synthesized and successfully utilized for arsenic removal from groundwater (Mohan and Pittman, 2007; Bhattacharya et al., 2013; Zhang et al., 2007; Gupta et al., 2011; Gupta et al., 2012).

These oxides were characterized by scanning electron microscope (SEM), transmission electron microscope (TEM), X-ray powder diffraction (XRD), Fourier-transform infrared spectroscopy (FTIR), and BET surface area analysis. Researchers also analyzed the sorption kinetics and isotherm, the effect of the initial solution pH, and the thermodynamic parameters of sorption equilibrium for these oxides (Stanić, M.H., Nujić, 2015). All of these oxides showed very high arsenic-removal capacity (>90%) for both As (III) and As (V).

Application of iron based nanomaterials: The magnetic properties of iron nanoparticles facilitate their separation from water by magnetic force or by high-gradient magnetic separation (HGMS) (Yeap et al., 2017). Iron compounds such as hematite (α-Fe_2O_3), maghemite (γ-Fe_2O_3), akaganeite (β-FeOOH), ferrihydrite ($Fe_5HO_8 \cdot 4H_2O$), goethite (α-FeOOH), and lepidocrocite (δ-FeOOH) are popular materials for arsenic remediation because of their low leaching characteristics (Ghanizadeh et al., 2010; Nassar, 2012; Feng et al., 2012).

Application of nanostructured alumina: Arsenate sorption on nanoactive alumina was reported by X.H. Guan and co-workers (Guan et al., 2009). The average particle size of the material was 2.99 nm., with specific surface area of 359 m^2/g. Effect of initial solution pH study on As(V) sorption showed that the sorption capacity depend on initial loading of arsenic. W. Li also reported arsenic sorption study of highly ordered mesoporous alumina (Li et al., 2011). The team synthesized different alumina samples having pore size ranging from 3.8 nm. to 6.6 nm. The mesoporous alumina can remove arsenate ions efficiently in the initial pH range of 4–9. The material showed arsenate and arsenite sorption capacity of 19.8 mg/g and 5.0 mg/g respectively at low concentration range.

Application of nanoscale zerovalent iron: Experiments on zerovalent iron (nZVI) reported its high adsorption capacities for most of the toxic metals including arsenic. nZVI is an useful option for speedy removal of pollutants from aqueous solution and is extensively used for arsenic removal (Li et al., 2006; Morgada et al., 2009). nZVI has relatively higher capacity of arsenic removal than conventional sorptive media and granular iron particles (Li et al., 2006).
Recently, green routes have been followed for synthesizing low cost nZVI. Leaf extracts of cherry, mulberry, oak had been used for preparation of NZVI (Sofija et al., 2016). Extracts of *Vaccinium corymbosum* leaves and shoots were applied as reducing agents for green synthesis of NZVI (Cerda et al., 2017). However, green NZVI had slower rate of As(V) removal than chemically synthesized NZVI.

Application of carbon nanotubes: Carbon nanotubes (CNTs) and their composites have attracted significant attention due to their excellent adsorption performance (Bhattacharya et al., 2013). CNTs have high sensitivity and selectivity toward metal enrichment and detection. CNTs are difficult to remove from the adsorbed solutions, however, use of CNTs-based magnetic hybrids have overcome the problem. Modified activated carbons and zeolites enriched with iron nanoparticles showed higher adsorption capacities for heavy metals (Stanić, M.H., Nujić, 2015).
A novel sorbent consisting of cerium oxide supported on carbon nanotubes (CeO_2-CNTs) was developed with high surface area (189 m^2/g), With high capacity of arsenic removal. 81.9 and 78.8 mg/g of As (V) was removed in the presence of Ca^{2+} and Mg^{2+}, respectively (Peng et al., 2005). Magnetite-coated multiwalled carbon nanotubes (Fe_3O_4-MWNTs) was synthesized which was capable to remove both As (V) and As (III) (Mishra and Ramaprabhu, 2010). The combination of magnetic iron oxide nanoparticles and multiwalled carbon nanotubes (MIO-MWCNTs) was capable of As (III) adsorption from 4.25 to 6.95 mg/g between pH 1.6 and 6.8, and of As (V) adsorption from 9.09 to 3.69 mg/g between a pH range of 1.7 to 7.9 (Li et al., 2016).
A high-performance arsenic adsorbent was synthesized by encapsulating iron oxide within a carbon nanosphere to produce a

nanocomposite that was reported to achieve higher adsorption of both As (III) and As (V) than activated carbon, CNTs, and mesoporous carbon (Su et al., 2017).

Application of Titanium based nanomaterials: Several researchers have investigated the application of titanium dioxide (TiO_2) and TiO_2-based materials in arsenic removal (Ashraf et al., 2019). Nanocrystalline TiO_2 mediated equilibrium adsorption of As (III) and As (V) was performed within 4 hours, and the adsorption followed pseudo-second-order kinetics (Peng et al., 2005; Guan et al., 2012). Removal of As(III) by using a synthesized crystalline hydrous titanium dioxide was studied by a group of researchers. It was revealed that 70% of As (III) was adsorbed within the first 30 minutes of contact with crystalline hydrous titanium dioxide (Manna et al., 2004).

Application of Zirconia and zirconia based nanoparicles: Zirconia nanoparticles were applied for both As (III) and As (V) removal (Ma et al., 2011; Zheng et al., 2012). Granular activated carbon media impregnated with zirconium dioxide nanoparticles (Zr-GAC) was synthesized and applied for arsenic and other organic contaminant removal from water (Sandoval et al., 2011).

Application of graphene: Large surface area and presence of surface functional groups have made graphene as useful adsorbent for water purification (Bhattacharya et al., 2013). Reusability, convenience of magnetic separation, high removal efficiency and fast kinetics make the materials useful for effective removal of heavy metals including arsenic from contaminated water. A group of researchers developed graphene sheets by hydrogen-induced exfoliation of graphitic oxide followed by functionalization (Mishra and Ramaprabhu, 2011.). The adsorbent showed high removal efficiency and effective cyclic repeatability for high concentrations of As (III) and As (V) from aqueous solution and seawater. Nanohybrids made from graphene oxide and manganese ferrite ($MnFe_2O_4$) magnetic NPs was studied for their efficiency in arsenic removal (Kumar et al., 2014). A graphene nanoplate-supported $CuFe_2O_4$ composite (GNPs/$CuFe_2O_4$) showed efficiency in arsenic absorption up to 58mg/g over a broad range of pH (La et al., 2017). A nanocomposite of reduced graphene oxide (RGO), Cu-exchanged zeolite A (Cu-ZEA), and magnetite nanoparticles (Fe_3O_4) with high surface area was capable of removing 50.51 mg/g arsenic from contaminated water (Khatamian et al., 2017).
Recently, a group of researchers synthesized graphene oxide iron nanohybrid (GFeN) by decorating iron/iron oxide (Fe/Fe_xO_y) core-shell structured iron nanoparticles (FeNPs) on the surface of graphene oxide (GO) via a sol-gel process. Removal capacities of 306 mg/g for As(III) and 431 mg/g for As(V) were achieved using GFeN. Rapid reduction (>99% in <10 min) of As(III) and As(V) (initial concentration, C_0 = 100 μg/L) was achieved with the nanohybrid (250 mg/L). They proposed that both electrostatic interaction and surface complexation contributed to ultra-high arsenic removal by GFeN (Das et al., 2020).

Application of multi metal oxide nanomaterials: Multi metal oxide nanomaterials were synthesized and studied for arsenic remediation. Several experiments proved that multi-metal oxides have greater sorption capacity than individual metal oxides. Several nanostructured binary metal oxides like iron-titanium, iron-zirconium, iron-maganese and cerium-manganese mixed oxides were synthesized, characterized and applied for arsenic removal from ground water (Gupta et al., 2008; Gupta et al., 2009; Gupta and Ghosh, 2009; Gupta et al., 2010; Gupta et al., 2011; Gupta et al., 2012). All these oxides showed very high arsenic removal capacity (> 90%) in both As(III) and As(V). Desorption studies showed that NaOH and KOH were effective in regenerating the adsorbents. Calcium ion incorporated hydrous iron (III) oxide was found to be capable of removing more than 90% arsenite from solution; mechanism assessment revealed that the adsorption of arsenite occurs via chelation (Ghosh et al., 2019). Cerium Aluminium mixed oxide nanoparticles also showed high efficiency in removing arsenic from contaminated water (Figure 1-4).

Micro and nano multi functional polymeric adsorbents doped with bimetals like Fe, Al was synthesized and studied for arsenic removal from contaminated water. As(V) sorption capacity of these materials were found to be very high (40 mg/g). Several metal oxide nanomaterials had been utilized in fixed bed columns for arsenic sorption from ground water. All the nanomaterials showed very high As (V) adsorption (Mohan and Pittman, 2007; Kumar et al., 2011; Bhattacharya et al., 2013).

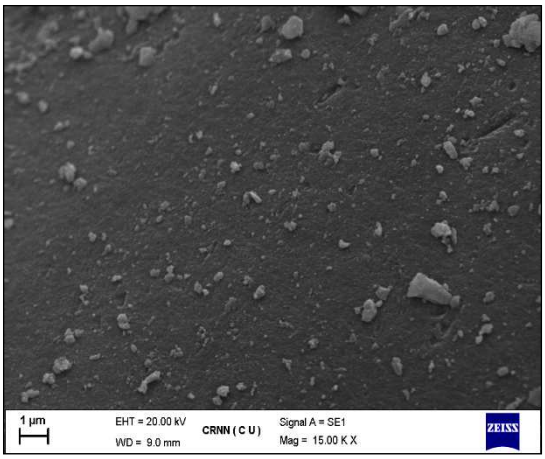

Fig. 1

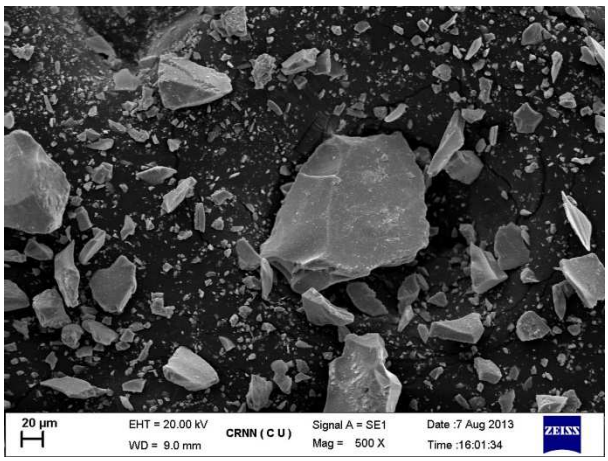

Fig. 2

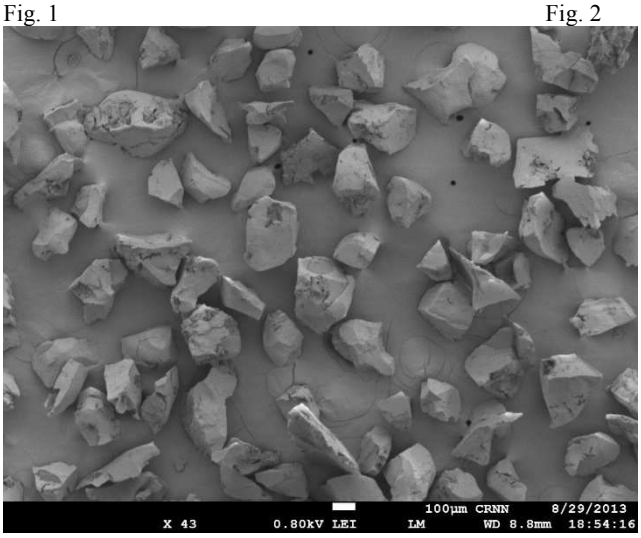

Fig. 3

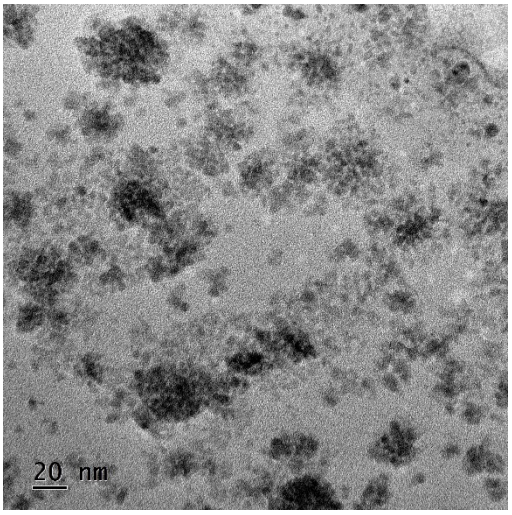

Fig. 4

Figures: Scanning electron microscope images (Fig.1,2), FE-SEM (Fig. 3) and Transmission electron microscope image (Fig. 4) of Nanostructured Hydrous Cerium Aluminium Oxide (NHCAO). The oxide is highly effective in removing As(III) from water within wide range of pH (Bhattacharya et al., 2017).

COST-EFFECTIVENESS OF NANOMATERIALS IN ARSENIC TREATMENT

Cost-effectiveness of the nanomaterials is highly essential and relevant, especially considering the socio-economic conditions of the third world countries. Nanomaterials are always given more preference for filtration than the bulk materials due their very high sorption capacity. However, selection of filtering materials needs some aspects to be focused upon:

(1) Synthesis path of the nanostructured materials should be very simple. A large amount of materials should be produced in a single set of synthesis process which is experimentally challenging.

(2) Starting materials should be cheap; so that the production cost of adsorbent would be reasonable.

(3) Filter development cost with nanomaterials should be low. Due to their very small particle size, nanomaterials have tendencies to disperse in aqueous medium. Special precautions must be taken and techniques should be followed to prevent dispersion of the nanomaterials in water.

(4) Regeneration and reuse of the adsorbent is always desirable for convenience of multiple uses (Mohan and Pittman, 2007; Bhattacharya et al., 2013; Nicomel et al., 2016).

RISK FACTORS OF NANOMATERIALS IN ARSENIC TREATMENT

The use of nanoparticles in environmental applications can lead to the release of the nanoparticles into the environment and ecosystems. Detail study of their mobility, bioavailability, toxicity and persistence can be useful for assessing their potential risks in the environment (Jawed et al., 2020). Insufficient information is available on the effects of possible exposures of nanomaterials to aquatic and terrestrial organisms. The rapidly growing use of engineered nanoparticles and their applications in wastewater purification and drinking water treatment also raised the question of removal of these nanoparticles from the urban water cycle.

The nanoparticles may need to be disposed once their saturation points are reached. For other metals and organics, nanoparticles may be recovered through combustion (Mohan and Pittman, 2007; Bhattacharya et al., 2013). Alternatively, encapsulation through stabilization-solidification, followed by secure landfill disposal can be a useful option for arsenic contaminating materials (Mohan and Pittman, 2007; Bystrzejewska-Piotrowska et al.). Regeneration and reuse of the adsorbents are also sustainable options in this regard. Several studies showed that the maximum adsorption capacity of metal-based nano-adsorbents remains almost constant after several cycles of regeneration and reuse (Leist et al., 2000; Hu et al., 2006).

Use of nanomaterials for arsenic removal from ground water is widely applicable since it produces small amount of sludge with less disposal problem. However, indiscriminate and unscientific use of nanomaterials for water treatment may cause environmental pollution (Banerjee and Chen, 2007).

Nanoparticles like nanoscale zerovalent iron shows very high mobility into water, which may cause transportation of adsorbed arsenic into water. Nanoparticles, due to their minute sizes, can pass through the cell membrane by endocytosis which is very harmful to all biological systems. However, detail study is needed on the nature and degree of toxic effects of different nanoparticles. Nano titanium dioxide, fullerene, carbon nanotubes etc. were found to be harmful for different species of fishes (Karn et al., 2009; Cheng et al., 2007). The fate of nanomaterials in the environment after use should be studied and analyzed thoroughly.

There is also a possibility of leaching of nanoparticles in the treated water; however, there are no such record documented so far. However, for studying the applicability of different sorbents at a commercial scale, detail studies on leaching of sorbents are needed. Phosphate, carbonate, and bicarbonate ions are efficient in inhibiting arsenic adsorption and can increase arsenic leaching from mineral surfaces (Handy et al., 2008).

CONCLUSION

While nanotechnology is considered to be the new buzzword by many in the scientific community, information regarding the subject remains largely dispersed and fragmented due to the relative novelty of the technology. But the increasing trends of researches which have been discussed so far have made it clear that nanotechnology holds an immense potential to be developed into a very potent water treatment tool of the 21st century. The development of flexible, mechanically stable and multi-functional nanomaterials is one of the prime focuses in the water and wastewater treatment process (Siddiqui and Chaudhry, 2017; Siddiqui et al., 2019). A large number of adsorbents are reported by different researchers for the treatment of arsenic contaminated water, which have been summarized in this article. It is evident from the studies that nanomaterials are much more effective in removing arsenic (both As III and As V) from water than bulk materials. However, many of the techniques of arsenic treatment involving nanotechnology have only been investigated in laboratory scales, and yet to be studied in natural conditions. The incorporation of nanomaterials into existing arsenic purification systems is another key challenge for the hydrologists. Further laboratory investigations and pilot scale testing are needed to integrate novel nanostructured membranes into existing arsenic purification systems. Integrating inorganic and biomaterials together can increase the efficiency of arsenic removal process. A critical balance is needed between opportunities and risks of nanotechnology in arsenic purification with respect to their impact on the environment.

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SU İLE YAŞAM: "TARİHİ KENT DOKULARINDA SU VE PEYZAJ"

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ÖZET

Su, insan yaşamında vazgeçilmez bir gereksinim olarak, dünyada insanlığın var oluşundan itibaren, yaşamın öncelikli ögesi olmuştur. İnsanlık tarihinde gerek göçebelikte gerekse yerleşik düzende su ile buluşmak, suya yakın olmak, yaşamın sürdürülebilirliği için çok önemli bir etken olduğu ve insanların hep suya yöneldiği bilinmektedir.

Günümüze ulaşan ve tarihi kent dokuları bulunan yerleşimlerin, deniz veya göl kıyılarında, ya da akarsu boylarında konumlandıkları ve suyun, insan yaşamı yanı sıra doğal çevreye sağladığı katkılarla da sürdürülebilir kentsel gelişim ile zengin peyzaja sahip oldukları görülmektedir.

Tarihi kent dokuları, ilk oluşumlarından itibaren, geçmişlerindeki farklı uygarlıklara ait kültür mirasları ile gelişimlerini, bütünleştikleri su kaynağının sağladığı yaşamla sürdürmüşler; insan için önemli bir bileşen olan doğayla iç içe yaşam da bu tarihi dokuların açık kamusal alanlarındaki peyzaja hayat veren su ile gerçekleşmiştir.

Dünyanın anıt-kıtası Avrupa'daki ülkelerin, bünyelerindeki çok zengin tarihi mimari ve sanat eserleriyle günümüzde birer turizm merkezi olmuş kentlerinin tarihi dokularının yer aldığı kent merkezlerinden akarsular geçmekte ve buralara, geçmişte olduğu gibi halen yaşam vermektedirler. Tarihi dokularda gerek akarsular boyunca gerekse diğer alanlarda, koruluklar, kent parkları, bahçeler, avlular ile cadde ve meydanlar gibi kamusal açık alanlar, çeşitli ağaç ve bitkilerle donatılmış, yeşile bürünmüşlerdir. Yaşları yüzyıllarla değerlendirilen birçok ağacın bulunduğu tarihi dokulardaki peyzajın, kentlerin tarihlerindeki oluşum ve gelişimleri ile paralellik gösterdiği anlaşılmaktadır. Bu yeşil alanlar, kent halkının olduğu gibi, kenti ziyaret eden turistlerin de fiziki ve ruhsal yaşam gereksinimlerini karşılamakta, yapısal ve nüfus yoğunluğuna sahip tarihi kent dokularını, doğa ile iç içe yaşatarak kentlere can vermektedirler.

Bildirimizi oluşturan çalışmamızda, UNESCO tarafından Dünya Kültür Mirası Listesine alınmış, su ile yaşam bularak günümüze gelen Vilnius, Prag, Lyon, Floransa ve Budapeşte örnek tarihi kent dokularının bulunduğu kentlerin, kuruluşlarından itibaren, peyzajları ile birlikte oluşum ve gelişimlerinin sürdürülebilirliğinin suyla gerçekleşmesi irdelenecektir.

Anahtar Kelimeler: Su, Yaşam, Kent, Tarihi doku, Peyzaj.

LIFE WITH WATER: "WATER AND LANDSCAPE IN HISTORICAL CITY TEXTURES"

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ABSTRACT

As an indispensable necessity in human life, water has been the primary element of live since the existence of humanity on this planet. It is well known that finding water and being close to it has been a very important factor in the sustainability of life and that people have always headed towards water throughout the history of mankind, whether during nomadic life or in permanent settlement.

It is observed that settlements with historical urban textures, which have reached the present day, were established on sea coasts or lakeshores, or on river banks, and they possess a sustainable urban development and a rich landscape with the contributions of water to human life, as well as the natural environment.

From their initial formations, historical urban textures sustained their existences and continued their developments with the cultural heritages from the various civilizations in their past, with the life provided by the water source with which they became integrated. Life entwined with nature, an important component for humans, has been realized with water, which has given life to the landscape in the open public spaces of historical textures

Rivers run through the centers of cities of the monument continent of the world Europe, where historical textures take place, and which are touristic centers at present with the rich historical architectural and artistic works they house, and these rivers still give life to these places just like they did in the past. Groves, city parks, gardens, yards, open public spaces such as avenues and squares in the historical textures are endowed with various trees and plants, turning them green, both along the rivers and in other places. It is understood that the landscape in historical textures, with many trees centuries old, are in parallel with the formation and development of the history of cities. These green spaces meet the physical and psychological life necessities of both the city dwellers and visiting tourists, and give life to cities by placing the historical urban textures, which have a concentration of population and construction, within nature. This study will examine the formation and sustainability of development of Vilnius, Prague, Lyon, Florence, and Budapest with water, which have exemplary historical urban textures and are placed in the World Cultural Heritage List by UNESCO.

Key Words: Water, Life, Urban, Historical texture, Landscape.

1. GİRİŞ

Tarihi kent dokuları, kentlerin ilk kurulduğu dönemlerden itibaren, tarihi süreç içerisindeki farklı medeniyetlerin etkisi ile gelişim göstererek günümüze ulaşan kültürel miraslardır. Bu dokuların gelişimleri, bulundukları bölgenin coğrafi ve fiziki koşullarının yanı sıra geçmişlerindeki tarihi dönemlerin üsluplarına göre de değişiklik göstermektedir. Geçmiş uygarlıkların sosyal, ekonomik yapılarını, estetik anlayışlarını ve yaşam biçimlerini içerisinde barındıran tarihi kent dokuları, günümüzde etkileyici, öğretici ve ilgi çekici olarak da önem kazanmaktadır. İnsan ölçeğine uygun olarak planlanmış bu alanlarda vakit geçirmek, bireylere psikolojik açıdan yarar sağlamakta, toplumsallık duygusunu geliştirmekte ve sosyal ilişkileri olumlu yönde etkilemektedir. Günümüzde, geçmişe ait tarihi eserleri zaman ve mekândan yoksun bir şekilde müzelerde incelemek ve anlamlandırmakla yetinmek durumunda kalıyoruz. Oysaki günümüze ulaşabilmiş olan tarihi kent dokuları, birer açık hava müzesi niteliğine sahip kültürel zenginliklerimizdir [1].

Tarihi kentsel peyzaj, doğal ve kültürel değerlerin sahip oldukları niteliklerinin tarihi süreç içerisinde gelişme göstermesi sonucu ortaya çıkan kentsel alanlar olarak tanımlanmaktadır. Tarihi merkez veya topluluk kavramlarının ötesine uzanan tarihi peyzaj, geniş kentsel ve coğrafi alanları kapsamaktadır. Tarihi kentsel peyzaj, yer aldığı tarihi dokunun; fiziki ve coğrafi özelliklerini, tarihi ve çağdaş yapısını, yer altı kaynaklarını, altyapılarını, açık alanlarını, bahçelerini, arazi kullanım biçimlerini, mekânsal organizasyonunu, görsel ilişki ve kentsel yapının diğer tüm unsurlarını içermektedir. Bunun yanı sıra dokunun sosyal ve kültürel değerlerini, ekonomik süreçlerini de kapsamaktadır [2].

Tarihin ilk dönemlerinden itibaren insanlar, yerleşim alanlarını genellikle nehir ve göl kenarlarında oluşturmuşlardır. İlkel dönemlerden itibaren toplayıcılık ve avcılık ile yaşam süren insanların,akarsu, nehir, göl gibi su kaynaklarının çevrelerinde yerleşmeleri, hayvancılık, tarım gibi alanlarda gelişmenin yaşanmasına ve nüfusun bir araya toplanmasına neden olmuş; böylece ilk yerleşimler oluşmaya başlamıştır. Tarih boyunca su kaynaklarının çevresinde oluşturulan kentler; sosyal, kültürel, ekonomik ve yeşil alanlar açısından önemli gelişmeler göstermiş ve insan yaşamına olumlu katkılar sağlamıştır.

Araştırmamızda incelenmek üzere seçilmiş olan; Vilnius, Prag, Lyon, Budapeşte ve Floransa tarihi kent dokularının bütünleştikleri su kaynaklarıyla yaşam bulmaları ve peyzajlarının da su ile sürdürülebilir gelişim göstermesi, çalışmamızda vurgulamak istediğimiz suyun insan yaşamındaki önemini açıkça ortaya çıkarması nedeniyle araştırmamızı önemli kılmaktadır.

Çalışmamızın amacı, su kaynakları çevresinde yaşam bulmuş olan tarihi kent dokularının peyzajlarının sürdürülebilirliğinin ve suyla yaşamın öneminin ortaya çıkarılmasıdır. Bu amaç doğrultusunda, incelenmek üzere seçilmiş olan örnek kentlerin; tarihi dokuları ile sahip oldukları kent peyzajı, kamusal yeşil alanları ve kent parklarının detaylı olarak irdelenmesi hedeflenmiştir. Suyun yaşamsal önemi, tarihi kent dokusu, kültürel peyzaj kavramları ile birlikte Avrupa'dan örnek olarak seçilmiş olan beş adet kentin tarihi doku ve peyzajlarının su ile yaşam bularak oluşumları ve sürdürülebilir gelişimleri çalışmamızın kapsamını oluşturmaktadır.

Çalışmamızda, nitel araştırma yöntemi kullanılmıştır. Bu kapsam doğrultusunda, öncelikle araştırmamızın temelini oluşturan; tarihi kent dokusu, tarihi kentsel peyzaj kavramları ve su kaynakları çevresinde oluşum gösteren kentler ile ilgili literatür taraması yapılmıştır. Çalışmamız kapsamında incelenmek üzere seçilen, su kaynakları çevresinde gelişme gösteren, UNESCO dünya miras listesinde yer alan tarihi kent dokusuna sahip beş adet (Vilnius, Prag, Lyon, Budapeşte, Floransa) kentin; tarihi, kent planları, peyzaj planlamaları hakkında bilgilere ve bu kentler ile ilgili görsellere ulaşabilmek için detaylı araştırmalar yapılmıştır.

Araştırmamız kapsamında incelediğimiz tarihi kent dokularının tamamının su kaynakları çevresinde bulunması, peyzaj planlama açısından gelişmiş olması, UNESCO dünya miras listesinde yer alması ve koruma yenileme çalışmalarının disiplinli, doğru politikalarla gerçekleşiyor olması bu tarihi dokuların örnek olarak seçilmesine neden olmuştur.

2.TARİHİ KENT DOKULARINDA SU İLE YAŞAM

Kent olgusunu, insan nüfusunun yoğun olarak yaşadığı ve barınma, çalışma, dinlenme gibi yaşamsal ihtiyaçlarını karşıladıkları mekânlar olarak tanımlanmak mümkündür. Kent, tarihin her döneminde farklı anlamlarla ifade edilebilen dinamik bir kavram niteliğine sahiptir [3]. Tarihi süreç içerisinde yaşanan değişimler ve gelişimlere bağlı olarak kentler, farklı kullanım ve yerleşim planlarıyla gelişim göstermişlerdir. Örneğin Orta Çağ'da savuma ve korunma amacıyla surla çevrili dışa kapalı kentler oluşturulmuş, sonraki dönemlerde ise artan nüfus, sanayileşme gibi nedenlerin etkisiyle dışa açılan kentler gelişim göstermiştir [4]. İnsanlar ilk çağlardan itibaren yerleşim alanlarını su kaynaklarının çevresinde oluşturmaya başlamışlardır. Bunun başlıca nedenlerinden ilki, suyun insan yaşamındaki biyolojik ve hijyen gereksinimlerindeki önemidir. Diğer önemli neden ise yaşamsal ihtiyaçlardan olan tarımsal faaliyetlerin ve besin ürünlerinin yetiştirilmesidir [5]. Bu alanların önemli çekim merkezleri olması, yerleşim alanları olarak tercih edilmesi, yaşamın gelişmesini ve kentlerin oluşmasını beraberinde getirmiştir.

Tarihi süreç boyunca su kaynakları, insanlar için tarımsal faaliyetler, ticaret, sosyal yaşam alanlarının oluşması gibi birçok konuda önemli gelişmelerin yaşanmasına etkide bulunmuştur. Bu konularda meydana gelen gelişmeler ilk kentlerin oluşup doğa ile uyum içinde gelişmesine katkı sağlamıştır. Zamanla büyüme gösteren nüfus, ekonomik faaliyetler, sanayileşme gibi olgular kentlerin doğa ile uyumlu gelişmesini olumsuz etkilemiştir. Su kaynakları çevresinde yer alan kimi tarihi kentlerde geçmiş uygarlıklardan kalan değerler korunmuş ve günümüz ihtiyaçlarını karşılayabilecek nitelikte yenilenmiştir. Bu ihtiyaçların en önemlilerinden biri açık yeşil alanlarda oluşturulan buluşma toplanma ve dinlenme mekânlarıdır. Tarihi kentleri

ve su kaynaklarını koruma bilincine sahip politikaların olduğu kentlerin büyük çoğunluğunda bu alanların oldukça planlı bir şekilde gelişme gösterdiği görülmektedir [6], (Şekil 1).

Şekil 1: Vilnius tarihi kent dokusu Neris Nehri çevresi yeşil alanlar

https://previews.123rf.com/images/erix2005/erix20051607/erix2005160700324/59899813-upper-castle-and-neris-river-at-the-mindaugas-bridge-vilnius-lithuania-ge%20diminas-tower-is-also-calle.jpg

Peyzaj, Fransızca "paysage" kelimesinden türeyerek dilimizde yer bulmuş, kelime anlamı olarak manzara, görünüm kavramları ile açıklanmaktadır. Batı dillerinde ise arazi düzenlemesi anlamını taşımaktadır. Peyzaj kavramı; çevre içerisinde bulunan farklı tabiatlardaki doğal ve kültürel elemanların, herhangi bir noktadan görüş açısına girebilen bütün halindeki görünüşü olarak tanımlanmaktadır [7].

Kentlerin mekânsal olarak gelişimlerinde yönlendirici bir arazi formu olan su kaynakları, peyzajında biçimlenmesinde önemli bir doğal kaynak olmuştur. İlkçağlardan itibaren günümüze kadar olan tarihi süreç içerisinde su kaynakları, açık ve yeşil alanların tasarlanmasında farklı amaç ve işlevlerde kullanılmıştır. Tarihi dönemlerde su ögesi peyzaj tasarımlarında; estetik, görsellik, işitsellik, psikolojik, fonksiyonel ile rekreatif amaçlarla durgun ve hareketli olarak kullanılmıştır [8].

Tarihi kent dokularında yer alan yeşil alanlar, tarihi süreçte o bölgelerde yaşayan insanların; eğlenme, dinlenme, vakit geçirme gibi rekreatif ihtiyaçlarını karşılamak için oluşturdukları alanlardır. Bu yaşamsal gereksinimler sonucunda oluşmuş olan yeşil alanlar, psikolojik ve fizyolojik açılardan da büyük önem taşımaktadırlar. Yeşil alanlar, bulundukları yerleşim alanlarının tarihi kadar eski bir geçmişe sahiptirler. Tarihi süreç içerisinde toplumların yaşam biçimlerine, kültürlerine göre fonksiyonel farklılıklar göstererek oluşum ve gelişimlerini sürdüren yeşil alanlar, günümüze ulaşmış olan önemli mirasların bir parçası olarak değer kazanmaktadırlar. Bu tarihi miraslar, değişen sosyal, kültürel, ekonomik ve fiziki koşullardan olumsuz etkilenmekte, günümüz ihtiyaçları doğrultusunda yeniden biçimlenmekte ve bozulmalara yok oluşa maruz kalmaktadırlar. Bu nedenlerden dolayı, tarihi kentsel peyzaj alanların korunması ve yenilenmesi önem arz etmektedir.

Geçmişten günümüze kadar su ile yaşamın sürdürülebilirliğinin görüldüğü tarihi kent dokularındaki su ve peyzajın önemini aşağıdaki örnek Avrupa kentlerinde şöylece irdeleyebilmekteyiz;

2.1. Vilnius tarihi kent dokusunda peyzaj

Litvanya'nın başkenti Vilnius, 1253 yılında Vytenis hükümdarlığında, Vilnia ve Neris nehirlerinin sağladığı yaşamla ticari bir kent olarak kurulmuştur. 1503 ve 1522 yılları arasında, savunma amacıyla, kentin çevresine dokuz kapılı şehir surları ve üç kale inşa edilmiştir. 1654 tarihine kadar kent su kaynaklarının da etkisiyle kültürel, bilimsel ve ticari anlamda önemli gelişmeler yaşamıştır. 1654-1667 yıllarında yaşanan Rus-Polonya savaşı ve 1710 yılında ortaya çıkan veba salgını kentin gelişimi yavaşlatmıştır [9]. Kurulduğu ilk tarihten itibaren Litvanya'nın başkenti olarak varlığını sürdüren Vilnius kenti, yaşanan olumsuzluklar, savaşlara rağmen hızlı bir şekilde gelişme ve büyüme göstermiştir. 2020 yılında yapılan son nüfus sayımına göre kentin nüfusu toplamda 580.020 kişi olarak kayıtlara geçmiştir [10]. Vilnius, 2009 yılında Avrupa Kültür Başkenti ve Doğu Avrupa'daki en yeşil başkent olarak seçilmiştir. Dokunun kültürel ve mimari gelişiminde Gotik, Rönesans, Barok ve Neoklasik üslupları önemli bir etkiye sahip olmuştur. Günümüzde kentin tarihi dokusu, Roma, Ortodoks, Lutheran, Reform ve Doğu Rite Katolik topluluklarına ait 28 farklı kilise, Katedral Meydanı ve Kale tepesi gibi alanların etkisiyle turistik ve kültürel açıdan önemli bir merkez olarak varlığını sürdürmektedir.

Vilnius tarihi dokusunda Vilnia ve Neris nehirlerinin de etkisiyle peyzaj planlama önemli oranda gelişme göstermiştir. Tarihi dokunun büyük bir bölümünde halkın vakit geçirebildiği, çeşitli etkinlik ve gösterilerin gerçekleştiği kent parklarının yer aldığı görülmektedir. Bunun yanı sıra, kamusal açık alanlarda da peyzaj planlama önemli olmuştur.

Nehir kenarları ve kent merkezlerinde bulunan kent parkları oldukça geniş bir alanı kaplamakta ve kent halkı tarafından yoğun olarak kullanılmaktadır. Bu parklarda; gösteri ve konserlerin gerçekleştirildiği sahne, amfi, piknik alanları, çeşitli spor ve etkinlik alanları, göletler, süs havuzları, çeşmeler, kafeterya, hayvan barınakları, çocuk oyun elemanları, tarihi anıt ve heykeller, çeşitli kent mobilyaları, birçok farklı türde bitkisel ögeler ve yürüyüş yolları yer almaktadır. Vilnius tarihi kentinde, kent

parkları ve meydanlardaki peyzaj planlamanın dışında kiliselerin, kamu binalarının ve diğer birçok yapının bahçelerinin yeşil alan olarak planlandığı görülmektedir (Şekil 2).

a)Kūdrų Parkı b)Bernardine Şehir Parkı

Şekil 2: Vilnius tarihi dokusu yeşil alanları (http://www. vilniausparkai.lt/parkai/misionieriu-http:// www.vilniausparkai.lt/parkai/sereikiskiu-parko-sodai/planai-misionieriu-soduose/bernardinu-sodas/)

Orta Avrupa kent planlarının önemli bir örneği olan Vilnius tarihi kent dokusu, beş yüz yıl boyunca organik gelişim göstermiş ve günümüze büyük oranda korunarak ulaşabilmiştir. Tarihi dokunun peyzaj planlama açısından sahip olduğu durumun en önemli nedeni bölgeye yaşam veren Vilnia ve Neris nehirlerinin varlığıdır. Bu su ögeleri kentin kuruluşundan günümüze değin geçen süre içerisinde tarihi dokunun da gelişimine olumlu katkı sağlamıştır.

2.2.Prag tarihi kent dokusunda peyzaj

Çekya Cumhuriyeti'nin başkenti ve en büyük şehri olan Prag, Vltava Nehri'nin kenarında yer almaktadır. Kentte yaşamın Paleolitik Çağda başladığı, ilk sakinlerin ise M.Ö. 500 yıllarında Kelt Kabilesi olduğu bilinmektedir [11]. Prag, 900 yılından 1306 yılına kadar Premyslid Hanedanlığı, 1316 – 1526 tarihleri arasında ise Kral Charles ile Lüksemburg ailelerinin hanedanlığı tarafından yönetilmiştir. Bu dönemde kent ticari anlamda önemli gelişmeler yaşamıştır.Kentin yönetimi 1526 yılından sonra, Avusturya-Macaristan İmparatorluğu olarak bilinen Habsburg Hanedanlığına geçmiş ve 1848'de ilk milli kongrenin kurulması ile birlikte devrim hareketi başlamış ve kentin gelişimi hız kazanmıştır. 1918 sonrası Çekoslovakya Cumhuriyeti kurulmuş kent mimari ve ticari anlamda önemli değişimler yaşamış, gelişim göstermeye devam etmiştir. 1948 yılında yaşanan askeri darbe sonucu kentte bozulmalar oluşum göstermiş, gelişim yavaşlamıştır.1968 tarihinde Prag Baharı olarak isimlendirilen dönem başlamış, kentin idaresi Rusların eline geçmiş ve kent tekrardan yenilenerek gelişim sürecine girmiştir [11]. 1993 yılında Çekoslovakya Cumhuriyeti Çek ve Slovokya olarak ikiye ayrılmış, Prag kenti Çek Cumhuriyetinin başkenti olarak varlığını sürdürmeye devam etmiş ve2020 yılında yapılan nüfus sayımında kentin nüfusunun 1.324.277 kişiden oluştuğu kayıtlara geçmiştir [12]. Prag'ın tarihi kent dokusu 1992 tarihinde UNESCO tarafından dünya kültür mirası listesine eklenmiştir [13]. Günümüz turizminde Avrupa'da önemli bir çekim merkezi olan Prag tarihi kent dokusu Eski Şehir Meydanı, Caletna Caddesi, Toz Kulesi, Kinský Sarayı gibi açık alanları ve mimari yapıları ile önemli bir kültürel miras olarak varlığını sürdürmektedir.

Prag tarihi dokusunun peyzaj planlama açısından önemli oranda gelişme gösterdiği görülmekte, gelişimin en temel etkeni kentin çevresinde Vltava Nehri'nin yer alıyor ve kente yaşam veriyor olmasıdır. Tarihi dokudaki yeşil alanların genellikle nehrin kenarlarında oluşturulduğu bunun yanı sıra tarihi yapıların bahçelerinde, kamusal açık alanlarda da peyzaj planlamanın özenle düzenlendiği görülmektedir. Bu alanlarda genellikle; kent mobilyaları, kafeteryalar, heykeller, spor aletleri, çocuk oyun alanları, amfi, sahne, süs havuzları ve birçok farklı türde bitkisel ögeler yer almaktadır (Şekil 3).

a) Prag'da Vltava Nehri ve peyzaj b**)** Prag'da meydan ve peyzaj planlama (Sygic,2020)

Şekil 3: Prag tarihi dokusu yeşil alanları (https://www.bavul.com/sites/default/files/statichttps://travel.sygic.com/en/poi/old-town-square-/top_destinations/city/prag.jpgpoi:1863)

Prag tarihi kent dokusu IX. yüzyıldaki oluşum tarihinden günümüze değin geçen süre içerisinde birçok farklı üslup anlayışları ile gelişim göstermiş olan önemli bir kültürel mirastır. Dokudaki geçmişten günümüze gelen yeşil alanlar ve asırlık ağaçlar Vltava Nehri'nin kent tarihindeki yaşamsal önemini ortaya koymaktadır. Bölgenin korunması ve yenilenmesi için var olan koruma, politikası bu mirası daha da değerli kılarak yaşayan canlı tarih niteliğine ulaştırmıştır.

2.3. Lyon tarihi kent dokusunda peyzaj

Lyon, Fransa'nın önemli tarihi kent dokusuna sahip şehirlerinden biridir. Saone Nehri'nin kenarında yer alan ve Vieux Lyon olarak da bilinen tarihi kent dokusunun oluşumu, Romalılar Dönemi'nde başlamıştır. Yaklaşık 300 yıl süren Roma Dönemi'nde kent, önemli oranda gelişim göstermiştir [14]. 534 yılında Fransız Piskoposları'nın kenti ele geçirmesi ile dini yönetim anlayışının güçlü olduğu bu dönemde, kent gelişim açısından zayıflamıştır. Ortaçağın sonlarında kentte oluşum gösteren veba salgınları, sel ve kıtlık gibi sorunlar kentin gelişimini olumsuz etkilemiş ve Rönesans Dönemi ile birlikte kent tekrardan gelişim göstermeye başlamıştır. XVII. ve XVIII. Yüzyıllarda, Napolyon kent yönetimine hâkim olmuştur. Bu dönemde ticari anlamda yaşanan gelişmeler kent nüfusunun çoğunluğunun işçi sınıfının oluşturmasına etkide bulunmuştur. Tarihi süreç içerisinde buna bağlı olarak birçok ayaklanmalarla birlikte ve 1789 yılında Fransız Devrimi gerçekleşmiştir [15]. İkinci Dünya savaşı sırasında Almanya'ya karşı mücadele yürüten kentte, önemli hasarlar ve yıkımlar meydana gelmiştir. Savaşta hasar gören yapıların onarımı ve yenilenmesi ile birlikte Lyon, XX. yüzyılın ilk yarısında yeniden kent kimliğini kazanmıştır. Lyon'un Ortaçağ ve Rönesans Dönemlerine ait birçok yapının bulunduğu tarihi kent dokusu; Kuzey Eski Şehir (Saint Paul),Eski Kent Merkezi (Saint Jean), Güney Eski Şehir (Saint Georges) olmak üzere, Hristiyan Azizlere atfen üç bölgeye ayrılmış ve isimlerini o alanda bulunan dini yapılardan almışlardır. 1980 yılında, nüfusu 400 bin olan Lyon'un tarihi dokusu, 1998 yılında UNESCO tarafından dünya mirası listesine alınmıştır [16]. Gelişmelere ve yenilenmelere bağlı olarak kent, Avrupa'nın en büyük ticari merkezi olmuş ve 2017 yılında yapılan nüfus sayımında, Lyon'un nüfusu522.679 kişi olarak açıklanmıştır [17]. Günümüzde Lyon, Saint Paul Meydanı, Aziz John Caddesi, anıt ve katedralleriyle Fransa'nın önemli bir turizm merkezi niteliğini taşımaktadır.

Lyon'un tarihi kent dokusu, Saône Nehri'nin kente sağladığı yaşamla peyzaj planlama açısından önemli oranda gelişim göstermiştir. Bölgede yeşil alanların; nehir kenarında, caddelerde, sivil, dini mimari yapıların bahçelerinde ve kamusal açık alanlarda oluşturulduğu görülmektedir. Bunlar dışında, tarihi dokuda kent parkları ve kamusal bahçeler de yer almaktadır. SaôneNehri karşı kıyısında yer alan yeşil alanlar, farklı türlerde ağaçlardan ve çeşitli kent mobilyalarından oluşmaktadır. Bitkilerin boyut ve şekillerinden, geçmiş yıllara ait oldukları anlaşılmaktadır. Peyzaj planlamayı gördüğümüz diğer alanlar ise dini ve idari yapıların avlularıdır. Kente, fonksiyon ve estetik açılardan katkı sağlayan ve günümüzde müze olarak kullanılan bazı tarihi yapıların avlularındaki peyzaj düzenlemelerini bitkiler ve su ögeleri oluşturmaktadır (Şekil 4).

a)Lyon'da meydan ve peyzaj planlama b) Lyon tarihi dokusunda peyzaj

Şekil 4: Lyon tarihi dokusu yeşil alanları

(https://traveladventureseverywhe re.blogspot.com/2016/10/lyon-liyon-voyage-to-lyon-france-europe.html)

Lyon'un tarihi kent dokusu, Roma ve Orta Çağ'dan başlayarak günümüze kadar gelişim göstermiş farklı üslup anlayışları ile biçimlenmiştir. Tarihi doku, iki nehrin (Presgu ve Saone) ve üç tepenin birleştiği yerde bulunmaktadır. Alanın sahip olduğu coğrafik ve topoğrafik özellikleri, tarihi dokuda doğal peyzajın oluşmasına neden olmuş kültürel peyzajın gelişimine de katkı sağlamıştır. Tarihi dokunun yeşil alanlarını oluşturan bitkisel ögelerin birçoğunun geçmiş yıllara ait olması ve zarar görmeden günümüze korunarak ulaşmış olması, kültürel mirasın önemini ve zenginliğini öne çıkaran bir unsur olmaktadır.

2.4. Floransa tarihi kent dokusunda peyzaj

Floransa, İtalya'da Toskana Bölgesi'nin başkentidir ve Arno Nehri'nin kenarında yer almaktadır. Floransa coğrafik olarak İtalya'nın orta bölgesinde konumlanmakta; güneyinde Roma ve Napoli kuzeyinde ise Torino, Cenova ve Verona gibi önemli kent merkezleri bulunmaktadır. Tarih öncesine ait kaynaklara göre Floransa'da M.Ö. X. yüzyılın sonlarına doğru Liguryalıların, M.Ö. VIII. yüzyılda ise Villanovan toplumunun yaşam sürdüğü bilinmektedir. Kentte Roma topluluğunun yerleşim kurmasından yaklaşık üç yüzyıl önce, Etrüsk kavminin, ulaşım, ticaret, tarım gibi ihtiyaçlarını karşılayabilmek amacıyla burada yerleşim kurduklarının izlerine rastlanmaktadır. Etrüsklerin bu bölgeyi seçmelerinin nedeni bölgenin Arno nehri kıyısında bulunmasıdır [18]. Romalıların kente yerleşim kurmalarının başlıca nedenleri; kenti, askeri kamp alanı olarak

kullanmak ve tarımsal faaliyet yürütmek olmuştur.Tarihi süreç içerisinde Romalılar kentin ticari, mimari ve ekonomik açıdan önemli oranda gelişmesine katkı sağlamıştır. VI. yüzyılın ikinci yarısında Bizanslılar, kenti ele geçirmişler ve savunma amacıyla var olan kent surlarının içerisine daha küçük bir alanı sınırlayacak ikinci surları inşa etmişlerdir. Floransa kenti, 1176 yılında aristokratların yönetimine geçmiş ve 1737 yılına kadar Medici ailesi yönetimde kalmıştır. Bu dönemde kent mimari ve peyzaj açısından önemli oranda gelişim göstermiştir [19]. Kentin nüfusu 2016 yılı itibariyle 383,083 olarak kayıtlara geçmiştir [20]. Floransa tarihi kent dokusu, 2015 yılında UNESCO tarafından dünya mirası listesine alınmıştır [21]. Floransa kenti, açık hava müzesi niteliğindeki Signoria Meydanı, Michelangelo Meydanı, Floransa Katedrali, kamusal açık alanları ve mimari yapılarının etkisiyle tarihsel süreç içerisinde olduğu gibi günümüzde de Avrupa ve özellikle İtalya'nın ticaret, kültür, turizm merkezi özelliğine sahiptir.

Arno Nehri ile ikiye bölünmüş olan Floransa tarihi kent dokusunu peyzaj planlama açısından incelediğimiz zaman özellikle nehir kenarında olmak üzere doku içerisinde birçok sayıda bahçe ve park yer almaktadır. Dokunun peyzaj planlama açısından gelişmiş olmasının başlıca etkeni, bölgede yer alan nehrin sağladığı yaşamdır. Bir diğer etken ise kentin, tarihte aristokratlar ve krallar tarafından yönetildiği dönemlerde sarayların bahçelerine verilen önemdir. Floransa tarihi dokusunda yer alan bahçeler, Rönesans üslubu ile soylu ve krallar için düzenlenmiş alanlardır. Bu bahçelerin büyük çoğunluğunda; su ögeleri, heykeller ve çeşitli bitkisel elemanlar yer almaktadır. Giardino Bardini, Terzo Giardino, Giardino Corsi, GiardinoTorrigiani tarihi dokuda bulunan bahçe örneklerinden bazılarıdır. Bir kısmı Arno Nehri kenarında yer alan bahçelerin tamamına yakını günümüzde halkın kullanımına açık yeşil alanlardır. Arno Nehri kenarında bulunan Terzo Giardino bahçesi nehrinde etkisi ile adeta bir tablo görünümü kazanmıştır. Bahçe; banklar, ahşap heykeller, bitkisel ögeler ve yürüyüş yollarından oluşmaktadır. Tarihi dokuda bahçelerin yanı sıra nehir kenarı ağaçlandırma alanları, kent parkları ve gül bahçeleri de yer almaktadır. Kültürel peyzaj açısından büyük bir öneme sahip olan bu yeşil alanlar gerek bölgede yaşayan halk gerekse de turistler tarafından yoğun olarak kullanılmaktadır (Şekil 5).

a) Floransa'da kentsel peyzaj

b) Floransa kent parkı

Şekil 5: Floransa tarihi dokusu peyzaj planlama

(https://www.destinationflorence.com/en/blog/67-six-secret-(and-not-so-sec ret)-gardens-of-florence)

Floransa tarihi kent dokusu, Roma, Orta Çağ, Rönesans'ın etkisi ile gelişim göstermiş ve zengin mirası korunarak günümüze ulaşmıştır. Tarihi dokunun peyzaj planlama açısından gelişiminin en önemli unsuru Arno Nehri'nin bölgeye kattığı yaşamdır. Bir diğer önemli etken ise Rönesans üslubunun burada oluşum göstermesidir. Rönesans bahçe üslubunun doğayla bütünleşme düşüncesi ve bu çerçevede ortaya çıkan bahçe düzenlemeleri Floransa tarihi dokusunun peyzaj planlama açısından önemli bir değere ulaşmasını sağlamıştır. Tarihi dokudaki birçok tarihi kültürel peyzaj alanları büyük bir titizlikle korunarak, yenilenerek günümüze ulaşmıştır.

2.5. Budapeşte tarihi kent dokusunda peyzaj

Budapeşte, Macaristan'ının başkenti ve en büyük şehridir. Tuna Nehri'nin karşılıklı iki kıyısında yer almakta olan Buda ve Peşte şehirlerinden Buda tarihi kenti, Peşte ise yeni kenti oluşturmaktadır. Kentin tarihinin Milattan Önceki yıllarda Keltlerin bu bölgede yaşam kurması ile başladığı bilinmektedir. Romalılar, M.S. II. yüzyılda Budapeşte'yi işgal etmişler ve buraya Aquincum adını vermişlerdir. Bu dönemde kent mimari ve ticari açıdan önemli oranda gelişim göstermiştir. 1241 tarihinde Moğollar tarafından gerçekleştirilen istila sonrası, ilk önce Peşte sonra da Buda bölgesi yıkıma uğramıştır [22]. Buda bölgesi, XIV. yüzyıldan itibaren önemli oranda gelişme göstererek yeni bir görünüm kazanmaya başlamış XV. yüzyıl ise hem Buda hem de Peşte açısından en parlak dönem olmuştur. 1872 yılında Buda ve Peşte tek bir şehir olarak kabul edilmiş ve hızla gelişim göstermeye başlamıştır [23]. Kentin nüfusu, 2019 yılına ait nüfus verilerine göre 1.752.286 olarak kayıtlara geçmiştir [24]. Budapeşte tarihi kent dokusu 1987 yılında UNESCO tarafından dünya mirası listesine alınmıştır [25]. Günümüzde Budapeşte tarihi kent dokusunu oluşturan Kahramanlar Meydanı, Gellért Tepesi-Özgürlük Anıtı, St. Stephen Bazilikası, Buda Kalesi gibi önemli kamusal açık alanlar ile yapılar, dokunun turizm, kültür ve sanat açısından önemli bir merkez olarak varlığını sürdürmesini sağlamaktadır.

Budapeşte tarihi kent dokusu Tuna nehri ve yeşil alanlara verilen önemin etkisi ile kentsel peyzaj açısından önemli oranda gelişim göstermiştir. Tarihi doku içerisinde peyzaj planlama nehir kenarlarında, meydanlarda, caddelerde ve tarihi yapıların bahçelerinde görülmektedir. Bunun yanı sıra tarihi kentte birçok kent parkı da yer almaktadır. Kent parklarında çocuk oyun alanları, yürüyüş aksları, dinlenme alanları, heykeller ve su ögeleri bulunmaktadır. Nehir kenarında yer alan yeşil alanlar ise içerisinde bulunan çocuk oyun alanları, dinlenme alanları ve bitkisel elemanları ile bir kent parkı işlevine sahiptir. Oldukça

gelişmiş olan kamusal açık alanlardaki peyzaj düzenlemeleri kent halkının yaşamında önemli bir yer almaktadır [26], (Şekil 6).

a) Budapeşte kent parkı

b) Budapeşte meydan ve peyzaj

Şekil 6: Budapeşte tarihi dokusu peyzaj planlama

(https://budapestbylo cals.b-cdn.net/wp-contenthttps://budapestbyloc als.b-cdn.net/wp-content /uploads/2016/02/park_in_buda.jpg /uploads/2014/03/erzsebet_square.jpg)

Budapeşte tarihi kent dokusu, Paleolitik Dönemden günümüze kadar geçen sürede, insanların yerleşim alanı olarak seçmiş olduğu önemli bir bölge olmuştur. Bu seçimin ve dokuya ait peyzaj planlama, doğal peyzaj açısından gelişiminin en önemli etkeni, tarihi kentin Tuna Nehri'nin kıyısında yer alıyor olmasıdır. Budapeşte tarihi dokusunun nehir kıyısındaki doğal görünümü ve çevresi ile olan uyumu, tarihi kültür mirası alanları içerisinde önemli bir örnek teşkil etmektedir.

3. SONUÇ

Su, insan hayatında her zaman en önemli bir yaşamsal gereksinim olmuştur. İlkel dönemlerden itibaren insanlar yerleşim merkezlerini genellikle nehir, göl akarsu gibi su kaynaklarının çevresinde oluşturmuşlardır. Tarihin en eski dönemlerinde insanların bu alanları yerleşim alanı olarak tercih etmelerinde suyun; tatlı su ihtiyaçlarının karşılanması, hijyen, çeşitli bitki ve hayvan türlerinin gelişimine olanak sağlaması gibi olumlu etkileri neden olmuştur. Su kaynaklarının etkisiyle yaşam bulan bu alanlar yerleşimin kurulması ve topluluklar halinde yaşamın başlamasıyla birlikte ilk kentlerin oluşumuna katkı sağlamışlardır. Bunun yanı sıra su kaynakları, tarihi süreç boyunca insan hayatındaki ekonomik, politik, ticari ve sosyal konulara da olumlu yönde etkide bulunmuştur. Zaman içerisinde akarsular üzerinde taşımacılığın başlaması, ekonomik faaliyetlerin ve kentlerin olumlu yönde gelişmesine hız kazandırmıştır.

Tarihi kent dokuları, kentlerin tarihsel süreç içerisindeki oluşum ve gelişimlerini, sosyal, kültürel, ekonomik yapılarını, yaşam biçimlerini yansıtan geçmişten miras alanlarıdır. Bu alanlar, oluşturuldukları dönemlerin imkânları ile biçimlenmiş üstün nitelikli kent planlarına sahip ve birçok zenginliği içerisinde barındıran değerlerdir. Tarihi dokular, mimari yapıları ve tarihi kentsel peyzajı ile bütünleşerek değer kazanmaktadır. Tarihi kentsel peyzaj, kentler ile birlikte oluşum ve gelişim göstermiştir. Peyzaj alanlarının oluşumunda bölgenin sahip olduğu iklim ve coğrafik koşullarının yanı sıra su kaynaklarının varlığı da doğrudan etkide bulunmuştur. Tarihin her döneminde insanlar doğal olanı benimsemişler ve kendilerine doğal yeşil alanlar oluşturmuşlar; buraları gerek fiziki ihtiyaçlar gerekse de dinlenme, vakit geçirme amacıyla kullanmışlardır. Yeşil alanları oluşturan bitkisel ögelere yaşam veren en önemli olgulardan biri sudur. Bu nedenle su kaynaklarının bulunduğu çevrelerde oluşturulan peyzaj alanları, diğer bölgelere oranla çok daha gelişmiş ve geniş bir alan kaplamıştır.

Çalışmamız kapsamında peyzaj planlama açısından örnek olarak seçip incelediğimiz Vilnius, Prag, Lyon, Floransa ve Budapeşte tarihi kent dokuları, su çevresinde yer almaktadır. Tarihi süreç içerisinde farklı medeniyetlerin üslup anlayışları ile oluşup gelişim göstermiş olan bu tarihi dokular, korunarak günümüze ulaşmış olan kültürel miraslardır. Örnek tarihi kentlerin tamamının su kaynakları ile bütünleşmesi, peyzaj planlamanın da olumlu yönde gelişim göstermesine katkı sağlamıştır.

Çalışmamızda irdelediğimiz tarihi kent dokularından Vilnius, Vilnia ve Neris, Prag, Vltava, Lyon, Saone, Floransa, Arno, Budapeşte ise Tuna nehirlerinin sağladığı yaşamla, ilk oluşumlarından itibarengerek kentsel planlamaları gerekse peyzajları, hep gelişim göstermiş ve suyun sağladığı katkılarla sürdürülebilir olmuştur.Ayrıca bu kentlerdeki doğru koruma politikaları da tarihi kent dokularının peyzajları ile bir bütün olarak yaşamlarının sürmesini sağlamıştır.

Sonuç olarak, araştırmamızdaki örnek kentlerin tarihi dokularında da görüldüğü üzere, yerleşimlerde insanları doğa ile buluşturup, insanların fizyolojik ve psikolojik gereksinimlerini karşılayan peyzaj alanlarının zenginliği ve sürekliliği, suyun sağladığı yaşamla mümkün olduğu ortaya çıkmaktadır.

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