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PREFACE

This book explores research results tackled within the 2nd Annual Meeting of the 'International Group on Urban and Architecture Design' (INTEGO UAD)¹ held in June 2016 at the University of Florence. The Meeting, chaired by Dimitra Babalis, gave the opportunity to the INTEGRO UAD Partnership to exchange opinion focuses on design ideas and methodologies to embrace waterfront regeneration matters. Further, new ideas and proposals, that have emerged to respond to the challenges on *waterfront urban space*, are stressed and the lessons learned from different proposals and case studies across the Europe.

In this perspective, the INTEGRO UAD Partnership had come together to underline that in the today's city local authorities consider waterfront urban spaces as dynamic places to be re-designed. Waterfront planning and design process seems to be essential for the transformation of many urban patterns. Further waterfront change presents complexity but also offers great opportunities for recreational, sport, work and residential utility.

In this book the INTEGRO UAD faced research issues on waterfront urban spaces and proposals in a comparative way that can be considered to urban quality and wellbeing, to more social and culture integration. The International Research Group pointed out opportunities for design and redevelopment intervention to provide enjoyable urban spaces on existing core riverfronts, seafronts, canal sides including abandoned industrial sites and watersides of great environmental value. Proposed projects review environmental improvements and habitat restoration, well-planned urban contexts including preservation of cultural heritage.

Often, availability of land led to create ambitious urban frameworks schemes while environmental regulations led to reconsider differently waterfronts while people's participation guided towards discovering 'lost' waterfronts. Preservation and reuse of existing buildings can give the opportunity to revitalise urban waterfronts. Additionally, changing economies and changing urban landscapes can give the possibility to redevelop waterfront sites for a range of development purposes. It is, therefore, highlighting, that remaking waterfront urban spaces means rethinking urban landscapes of the Contemporary City.

The importance for waterfront change is to understand the planning and design process that should be concreted towards quality of urban spaces and future urbanity. The value to waterfront regeneration and the understanding of urban complexity could be used to respond properly to a range of problems and forms of interventions. By redefining urban policies and strategies with particular waterfront areas, it became possible to develop good planning and design issues.

¹ INTEGRO UAD is a European Partnership founded and chaired by Dimitra Babalis in 2015 at the University of Florence, Department of Architecture, DiDA. The International Group aims to provide multidisciplinary research and studies on innovative issues within the City in Change and its cultural heritage, tangible and intangible for new urban scenarios in different European contexts. The main aims of INTEGRO UAD are as follows:

- To define an innovative research in European Partnership and multidisciplinary
- To provide an international debate for knowledge, education and formation on Cities in Change, sharing ecological and sustainable design issues
- To explore the values of cultural heritage and its transformation
- To put 'fixed points' in preserving, regenerating and developing tangible and intangible cultural heritage
- To define design process in sensitive urban contexts and urban spaces and places.

So, instead of attempting to provide a more or less 'universal' design, it is important to express design that could be targeted by area. So, it remains necessary to define a waterfront area concerned with a very wide range of design initiatives facing different urban problems and needs.

The understanding of waterfront regeneration varied by different urban approaches that should define the areas or territories differently. So, for example, in some approaches it is local authority that being involved in the process with the view to achieving urban quality and economic wellbeing of residents and in order to make cities more competitive. In others it is local community or neighbourhood that are being involved in waterfront regeneration process to achieving practical initiatives and even particular local projects. Much has focused on discussion of such particular projects or of a series of case studies of best practice.

In a changing city improving urban quality and reinforcing urban dynamics is a challenge for urban communities everywhere. Across the world, great cities are regenerating and transforming their waterfronts. Successful results can be seen in London, Amsterdam, Barcelona, Lisbon and in a number of American cities.

Therefore, working in partnership with local authorities and local communities new waterfront visions can be created for great waterfront transformations to be taken into consideration.

The following aspects were particularly supported: Making waterfront urban spaces more attractive; Giving character and identity; Improving public access and connectivity prioritising pedestrian and cycleways; Designing for landscaping, protection and safety.

It is stressed that one of the main planning and design goal is to understand needs and opportunities for a proper waterfront use by introducing focal points that can provide a mix of activities for residents and visitors. The new regenerated waterfront locations can also establish links into adjoining neighbourhoods and create new cultural and social opportunities. Additionally, sustainable design for waterfronts means responding to environmental issues, social responsibility and economic development that can encourage people to live, work and enjoy in such areas.

In this book, the ecology and importance of the planning and design of green spaces and especially of pocket parks is described in many of the reviewing proposals and projects. Waterfront pocket parks would offer quiet places for people to sit and relax as well as plenty of places to be connected with water that can positively reflect to nowadays cities. The trend appears to be continuing and perhaps even accelerating with major designing and community assets.

A wide range of design ideas to resolve various waterfront topics were also identified that can help to give a general information on a number of waterfront key topics. In this context, all faced waterfront issues, they are not intended as a comprehensive list but rather as a set of some essential ideas that can help to achieve more with waterfront regeneration efforts.

Finally, most of the explored issues are still open to a more flexible thinking and discussion and the INTEGRO UAD is working to further develop urban waterfront matters.

Dimitra Babalis
Editor in Chief

INTRODUCTION

Waterfront Challenges for the Contemporary City

Dimitra Babalis

In the last decades, Contemporary City has undergone great changes that have strongly influenced its urban structure and image.

The growth tendencies that have characterised the planning processes of the past has helped to create an hybrid urban condition that revealed important for a significant change of city's urban environment.

Consequently, human and environmental resources need to be protected in order to meet the peoples' needs without compromising the ability of future generations as is established by the sustainable development theory since the Brundtland Report in 1987 and its confirmation later on with the Agenda 21 in Rio de Janeiro.

On the other hand, the recent economic crisis is experiencing a period of profound uncertainty from both urban and social point of view. For instance, the segregation phenomenon, constantly increasing, has contributed to the development of sub-cultures that have hostile attitudes to the rest of society. Additionally, environmental changes related to climate change and resource consumption, create serious problems from ecological and macro e micro climate point of view. In so doing, we have an increase frequency of extreme weather events (heat waves, major rainfall, etc), strongly damaging natural ecosystems and biodiversity.

Further, it is changed the role of public urban space as only space of socialisation. A new conception of open space that leaves the task to individuals to fulfill positive spatial functions has characterising the Contemporary City. The creation of new urban places have now to deal with the community to meet peoples' needs.

The future of Contemporary City depends, therefore, on the ability of those who live in it and mostly for those that should plan and design it and should facilitate its adaptation to underway sustainable urban changes.

Consequently, it is necessary to act on urban space regeneration with alternative strategies and projects and under the concept of sustainability and urban resilience. The new models of intervention they should consider a variety of social conditions, a variety of contexts and different urban spaces and they should act at different scale of intervention.

Contemporary City needs a new integrated approach and capable on guiding the today's urban change.

A starting point for urban regeneration and urban resilience should be considered within abandoned and derelict areas in both inner and outer urban areas. New concepts and methods in designing public space has to consider more than social inclusion but environmental enrichment and new opportunities for both city and people.

In this context, the future direction for Contemporary City should consider waterfront regeneration and heritage, waterfront aspirations and priorities schemes for intervention. To this end, planning policies and strategies should identify core waterfront sites that can drive design towards deliverable major interventions as well as small scale interventions while preserving cultural heritage.

The redesigning of derelict and abandon urban waterfronts is clearly meant to encourage ecological and sustainable urban change. In this respect, waterfronts should highlight potentialities improving waterside environment and reviewing emerging nodes that can add value and aware for a successful waterside design process. To do so, urban watersides can be considered as attractive places for wellbeing and sociability. Improving waterfronts can enhance integration of land and city's accessibility and connectivity. Further, can create new opportunities, re-configuring the image and identity of the city and offering a range of regenerated public open spaces.

These include:

- Adapting to climate change and to smart technologies
- Creating a walking/cycling culture
- Re-imaging working and living places.

Macro and micro urban design, therefore, attempts to propose projects that can give a new characterisation of urban space while their urbanity can offer solutions that should based on more specific criteria of ecological and sustainable management.

In response to climate change, many waterfront proposals seek to respond and promote sustainable development in a variety of ways by:

- Improving water quality and aquatic habitat restoration, where applicable
- Greening the waterfronts by upgrading, creating and linking new and existing parks and greenways to support biodiversity
- Promoting sustainable design and building development including energy use and waste minimisation
- Developing and implementing strategy for risk and urban resilience.

A main goal of urban waterfront regeneration is where a place can express cultural heritage and history. So the protection of cultural heritage can preserve local character including urban form and highlighting legacies.

Finally, the following questions to be put are:

- How can urban waterfront change contribute to tackling environmental challenges while preserving cultural heritage and improving urban environment?
- How can urban waterfronts serve to exchange ideas, information and cultural happenings?
- How can changing waterfronts and changing landscapes contribute to changing economies?

Structure of the book

PART 1 - *Advancing Riverfront Regeneration*

Urban Waterfronts and relations between urban spaces and social dynamics are the topic of planning and design in order to revitalise and re-appropriate urban environment; To restore and define urban form; To re-locate new uses and functions; To guarantee accessibility and interaction of waterfront places; To integrate nature and culture with social relationships.

Chapter 1 - *From River to Riverfront. Sustainable Masterplans and Connected Waterfront Urban Spaces along the Southside of the River Arno in Florence* by Dimitra Babalis. This chapter attempts to establish concepts and methods on urban change for a new dynamism on waterfronts and the creation of new urban scenarios. The Methodology undertaken is to propose a Waterfront Master Vision that should consider the importance of waterfront regeneration of sites in accordance of their location, historic, cultural and environmental values. The waterfront regeneration addresses the issue of core elements such as sustainability, urban quality, environmental improvement.

The River Arno in Florence is a fascinating example of designing with an edge, which in the past was a route of great importance but also a great risk for the City and people. Currently, the River has been poorly maintained, under-utilised and has lost its strong connection with the City. The riverfronts therefore offer an exciting opportunity to revive the contexts and reinstate the historic relationship with water and the City.

The focus is on defining the new role of the River and urban strategies for the creation of new urban spaces with a combination of high quality forms and uses. It is taking into account that the latest City Plan did not set a comprehensive vision for the River Arno while UNESCO urgently calls for a re-consideration of riverfront's risks and the need for detailed site-wide strategies that underpin re-connection with the Florence city centre. In this respect, the proposed Waterfront Master Vision should highlight potentialities and risks, improving waterside environment and reviewing emerging nodes that can add value and aware for a successful land-side design process. The master vision should put strategies identifying central points to transform through good design. Many of the concerns should be relating to the waterfront facilities, well-being, spatial and safety issues. At the same time, the re-connection, accessibility, pedestrianisation and use of green and temporary structures to control rivers' risks can guarantee quality of urban life.

This chapter contains two main sections: The first part includes general waterfront concepts while the second part describes the River Arno's proposed masterplan for future opportunities. The design concepts provide a review of the major problems that arose across the Southside of the River. Finally, a proposed Waterfront Master Vision has to become the basis for a good urban design strategy, an action river plan that will call for revitalisation of Florence riversides. It will identify a network of open spaces and pocket parks that can improve connectivity, social inclusion and environmental benefits.

Chapter 2 - *Industrial Riverscapes and Climate Change in the Dutch Delta Area. Ecological Resilient Strategies: Coping with the Future Noord River's Urban Waterfront* by Irene Curulli presents the Delta River area of The Netherlands. The area is characterised by the streambeds of the rivers Rhine and Meuse

that will undergo to spatial adaptations according to the implementation of the measures required by the National Delta Program (2010). The aim is to prevent future flood disasters consequent to rising water level due to climate change. In the past, the river edges of the Delta area hosted different manufactures such as: brick factories, shipyards and small harbours for recovery and trading. The rivers were the industrial 'highways' for the shipment of goods and raw material for production. Adaptations and integrations of the river edges were carried out during the centuries, giving shape to a unique maritime heritage and urban landscape that is embedded in the river history. Moreover, many Dutch cities, e.g. Dordrecht, flourished thanks to their location close to the rivers. Nowadays, many of these urban areas and water-related industrial sites are in danger.

This chapter focused on the specific Noord riverfront area that it connects the city of Dordrecht and Kinderdijk (UNESCO Heritage site, 1976) that is characterised by unique wetland areas and its industrial heritage. The Noord River area has potentiality to become a cultural and naturalistic route for local citizens and tourists that daily take the water route to reach their work or to visit the UNESCO site. The research on the Noord area is carried out at the Department of the Built Environment at the Eindhoven University of Technology. It aims to show how water dynamics and ecological resilient strategies of design can coexist and can safeguard the cultural heritage of the River. Moreover, it illustrates how water can be a creative source for regeneration, inspiring sustainable design. Finally, is shown an insight into the spatial structure of the Delta area, its historical changes and is analysed the former industrial-shipyard area, along the Noord River. It is also shown experiences of water-resilient design strategies providing new urban scenarios.

PART 2 - Outlining Blu-Green Opportunities

Proposing inclusiveness of urban spaces and places with promotion of sociability and enjoyment, integrating cultural and economic values, health and wellbeing are developed together with the concept of urban resilience and urban quality. Specifically, are taken into consideration waterfront landscapes with a great potentiality for regeneration and understanding of project methods and design principles that have also to be based on ecological, sustainable and smart design solutions.

It is also recorded consequences of human decisions and actions that led to the extinction of surface flows that gradually deteriorated quantity and quality of water and changed gradually urban scenarios.

Chapter 3 - The Waterfront Urban Space of the Argolic Gulf in Greece. Functional and Aesthetic Upgrade and Sustainable Development by Helen Maistrrou stresses a part of a design study which deals with functional and aesthetic upgrade on the Nafplio's waterfronts which lies at the tip of the Argolic Gulf in the Eastern Peloponnese in Greece. The Nafplio-Nea Kios waterfront area runs for approximately 6 km and it disposes some interesting features, offering exceptional features of a seaside wetland which concentrates rare flora and fauna species. Further, important historic and archaeological sites lie in the surrounding coastal zone and historic rivers which flow into the Argolic Gulf. The chapter aimed to formulate design proposals for the protection of the natural environment, for the promotion of the region's historic features, for

the connection of the coastal zone with the functions of the urban space of the adjacent areas and for the region's sustainable economic development. The waterfront regeneration can become an important cultural axis, having environmental, historic and regional value. The zone can contribute on one hand to the sensitisation of the local population in matters of cultural heritage and environmental protection, and on the other to the reinforcement of specialised tourism. Finally, the study proceeds with a pilot design for a sensitive part of the area proposing light-frame constructions to cover the need for movement and pause while allowing activities for bird watching and biodiversity.

Chapter 4 - *Surface Water Flows Management and Change of Urban Landscape in Thiva* by Ismini Kourouni presents the study of the water flows' management in the urban landscape of the city of Thiva, in Greece. The chapter initially highlights the role that the water has played in the establishment and development of the city. The rivers and streams were reasons for the choice of this specific place for habitation. These were for many centuries the main water supply source and main factor for agricultural and economic prosperity. Further, the plain was irrigated, watermills and many laboratories were operating. The water element also determined significantly the culture of the city of Thiva.

During the 20th Century, the quantity and quality of water have been gradually deteriorated and as a consequence its importance to the operation and development of the City has been underestimated. This research study attempts to record human decisions and actions that led to the extinction of surface flows. Permanent removal occurred during the 1980s after the decision on integrating them into the sewer network. At the site of Dirce River the Highway Elefsina - Thiva was formed. An outdoor market operated at the Northern Region of Chrysorroa Stream and the remaining space was used arbitrarily as a parking area. In Ismenos River no configuration performed, a part of it was covered by Oplarchigos Voglis street.

The chapter indicates the negative effects of the coverage of rivers and streams for the City and people. The consequences are not only related to the environmental and economic context. Many features of landscape, such as fountains, arched aqueducts and bridges have been lost. The urban fabric suffered significant changes by the removal of partial landmarks and the elimination of pathways associated with crossing regions of rivers. The social activity in public space was affected too. Finally, the chapter highlights contemporary ways of addressing existing negative conditions and converting them into opportunities for sustainable urban operation. Various methods are drawn from abroad and are related to applied programs. Especially, for the area of the city of Thiva, the recently implemented project of highlighting the stream of Chrysorroa is further analysed. With regards to the entire water network, the research study records the prospects and difficulties for sustainable management.

Chapter 5 - *Urban Bluespace for Human Flourishing* by Tim G. Townshend focuses on urban waterfront development as an essential aspect of human history. In the era of the industrial city, waterfronts were centres of industrial development and commerce. Such waterfronts, however, became effectively disconnected from the cities they served, due to the security needed

around port facilities and the pollution that accompanied industrial activity. Subsequently as ships increased in size - demanding deeper water and port facilities required greater areas of land - industry, transportation and port facilities increasingly relocated away from central locations and ageing 19th Century infrastructure. Historic waterfronts became abandoned, sites of dereliction and obsolescent buildings.

The chapter, analysed the transformation in waterfronts and the role that waterfronts and urban 'bluespaces' more generally contribute to urban living in the 21st Century. Clearly those willing to pay a premium to live and work next to waterfronts derive a benefit from their locale, but what does that benefit consist of? There is a burgeoning academic literature on waterfronts from a whole range of perspectives, economic, environmental and social. However, only relatively recently have more direct links between water bodies and human health and wellbeing been examined.



Urban Bluespace for Human Flourishing

Tim G. Townshend

Urban waterfront development is an essential aspect of human history. Early cities located near water as a source of food and transportation, as well as for the water itself. In the era of the industrial city, waterfronts were centres of industrial development and commerce. Such waterfronts, however, became effectively disconnected from the cities they served, due to the security needed around port facilities and the pollution that accompanied industrial activity. Subsequently as ships increased in size - demanding deeper water and port facilities required greater areas of land - industry, transportation and port facilities increasingly relocated away from central locations and ageing 19th Century infrastructure. Historic waterfronts became abandoned, sites of dereliction and obsolescent buildings.

Commencing with a handful of well-known waterfront (re)development projects in the 1960s, such as Boston and Baltimore, the fortunes of waterfront areas have been turned around. Over recent decades waterfronts in cities across the globe have been transformed, reinvented, regenerated and rejuvenated. In many ways they have become the symbol *par excellence* of urban resilience, demonstrating the ability of cities to adapt and adjust to new economic realities and to reinvent historic quarters (BREEN AND RIGBY, 1996; TIESDELL ET AL., 1996).

In today's competitive property market, homes, offices and retail spaces near water (especially with views over water bodies) always command higher rental, or purchase values, from those of an equivalent standard located elsewhere (see for example LUTTIK, 2000). The transformation in waterfronts has in turn lead to a heightened interest in the role that waterfronts and urban 'bluespaces' more generally contribute to urban living in the 21st Century. Clearly those willing to pay a premium to live and work next to waterfronts derive a benefit from their locale, but what does that benefit consist of? There is a burgeoning academic literature on waterfronts from a whole range of perspectives, economic, environmental and social. However, only relatively recently have more direct links between water bodies and human health and wellbeing been examined.

Defining Urban 'Bluespace'

All urban water bodies are important for urban socio-ecological systems. They are natural components of the hydrological cycle, they provide habitats for flora and fauna and are valued as places of recreation and relaxation. However, in this paper we will primarily focus on the relationship of the built environment and larger waterbodies (rivers, canals, and so on) as

opposed to smaller water bodies (such as streams and ponds). Since it might be argued these places are of greatest significance to the cities they serve. There are various nomenclature used in relation to areas of water in urban settings (water-fronts, blue infrastructure and so on) and these also vary somewhat in precise meaning between disciplines. Since this chapter attempts to link evidence from across disciplines of built environment, public health and environmental psychology an all-encompassing term 'urban blue space' has been adopted. In so doing, the chapter envisions a concept that encompass all visible water¹ bodies that occur in urban areas, building upon a previous term 'urban blue' (VOLKER AND KISTEMANN, 2011) it also considers evidence pertaining to the contextual settings of urban water, in other words their immediate surroundings – promenades, riverside parks and so on, through to beaches.

Urban Lifestyle Health Concerns and Wellbeing

Modern urban lifestyles can be profoundly unhealthy. Exposure to air pollutants, for example from heavy traffic have been associated with an increasing range of health concerns from respiratory problems, heart disease and even increased risk of developing dementia. Moreover sedentary lifestyles, encouraged by over-reliance on private car ownership and other technological advances, for example, expose humans to risk of becoming overweight and/or obese with associated increased danger of developing type-II diabetes, heart disease and a range of cancers (LAKE AND TOWNSHEND, 2006). Our congested polluted cities cause heightened stress levels and mental health problems through psychological arousal and overload. Furthermore exposure to traffic raises levels of physical injury and even death, for example in the USE traffic accidents are the number one cause of mortality in 1-21 years olds. Moreover even though our urban areas are full of people, for some they are places of social isolation, loneliness and depression.

The health concerns that accompany modern urban living are also not

equally spread, the poorer in society almost always suffer a high level of exposure to risk – in the UK for example a child living in poorer areas suffer higher exposure to pollution, are more likely to be obese and are four times as likely to be involved in a traffic accident than children living in more affluent areas (MARMOT, 2010).

However, while our urban areas are settings for ill-health and harm, they can also provide places supportive of healthy lifestyles, conducive to allowing neighbours to interact, to take exercise and have spaces for much needed relaxation. Research for example has shown that neighbourhoods, designed in pre-automobile eras tend to be more supportive of walking as means of transport and for pleasure; and that urban parks in particular can be vitally important for mental restoration and as a setting for physical activity and socialisation (TOWNSHEND, 2014). When people enjoy good health, mental well-being and have a thriving social life, they lead rich fulfilling lives, in other words they 'flourish' – and so this chapter using this term to encapsulate a holistic concept of physical, mental and social wellbeing.

Therapeutic Landscapes and Bluespaces

There is in fact an extensive current literature on aspects of environment and human flourishing (see COOPER ET AL. (2014) as an example of a reference guide); though water is somewhat overlooked. This may seem surprising when the essential attribute of water as the life giving natural resource is considered. Moreover, the therapeutic properties of water sources also stretch back into human history. Many places of healing, for example, were founded on the existence of hot, or cold springs thought to have medicinal powers. There is also a long spiritual element with some water sources for example thought to be divine in nature. The Romans built such baths at Bath, England in the 1st Century AD, but these were based on a much more ancient shrine. More recently the shrine at Lourdes France, is good example where water is still thought to have divine power and in Ireland people bathe

¹ N.B. many urban areas contain water bodies (rivers, streams, canals etc.) which were historically culverted i.e. covered over – the motivation for this was varied but included health concerns when water sourced became polluted and a source of disease.

their children in holy wells as form of infant health promotion and spiritual protection (FOLEY, 2010).

Such a focus on healing was very much central to Gesler's development of the concept of 'therapeutic landscape' (1993; 2003). Gesler characterised the dimensions of therapeutic landscape as physical, spiritual and social – these combined to create a holistic notion of health. However while this early exploration focussed on specific sites and healing subsequently the proposition that many types of landscape are *salutogenic*, or 'health promoting' has been developed and the range included greatly broadened. Here early developmental work of Gesler's concept often focussed on natural landscapes, places of natural beauty that people seek out for relaxation and to 'get away from it all'. However many spheres of research have warned against excessive emphasis on the urban rural dichotomy – not least since many environments are to an extent manmade - and more recently some research has focussed on the potential of urban environments to be supportive of health and wellbeing (see WILLIAMS, 2007). Increasingly therapeutic landscape research has explored the benefits associated with commonplace sites that people experience in their everyday lives and so urban environments have become a focus.

The Salutogenic properties of greenspace are now well-established. HARTIG ET AL. (2014) identify four key mechanisms, stress reduction and restoration; opportunities for increased physical activity; opportunities for greater socialisation; and improved environmental quality – for example cleaner air. It is possible that spaces that are primarily blue as opposed to green, including urban bluespaces possess these qualities. Moreover it is also possible that the presence of water may include added benefits. Water features for example have been a prominent element in healing gardens and similar therapeutic settings. They are well known to provide positive distraction for both visual, auditory and even olfactory senses). The calm sounds of water, for example, have been found to be restorative (WHITE ET AL., 2010) while the colour blue is associated with coolness and good water quality (BURMIL ET

AL., 1999); this latter study also found that waterbodies incorporated in high quality urban design schemes were particularly valued by observers. More generally blue spaces in both urban and rural settings are associated with stress-reduction, mood enhancement and enjoyment (KARNANONV AND HAMEL, 2008) and views of water have been identified as potentially beneficial for perceptions of personal health (BURMIL ET AL., 1999).

In the past many studies exploring the links between human wellbeing and greenspace in fact contained water bodies within the landscape (see for example HAN, 2003; LAUMANN ET AL., 2001) however the influence of the presence of water was not explicitly extracted for separate examination. Generally environmental psychologists have highlighted the human enthrallment with water bodies (see for example, HERZOG, 1985; KORPELA & HARTIG, 1996; WHITE ET AL. 2010). Research has also shown that people choose coastal locations for places to visit to reduce stress and feel relaxed (WHITE ET AL., 2013b), this latter work established that living near the coast was associated with visiting it more often (increasing exposure to positive impacts) and that the people associated coastal visits with greater stress reduction than with equivalent visit to other recreation settings such as urban parks. Research in the UK found

Notions of 'therapeutic landscape' – Ulswater, Cumbria, UK.



Water feature, Exchange Square, Manchester.

Grand Canal, Dublin, Eire.

Newcastle, UK, regenerated quayside.

that living near the coast was associated with increased levels of physical activity (WHITE ET AL., 2013); though not all studies have established a link between proximity to water and exercise (HALONEN ET AL., 2014). Based on the notion that people living near water seem to be happier and healthier in the UK a 'Blue Gym' initiative² has launched to assess the potential for water bodies to not only to enhance and promote health and wellbeing but in so doing increase protection of these vital environments (WHITE ET AL., 2016).

There are also a number of other tangential areas of research which may be important to the blue space and wellbeing debate. Environmental psychologists have for example highlighted the restorative effects on well-being from places of strong community attachment (KORPELA AND HARTIG, 1996) waterfronts have often become associated with strong sense of place attachment, particularly for cities that have reinvented themselves in the post-industrial era.

However, research explicitly into the potential of urban waterfronts to be supportive of healthful lifestyles and therefore important to community well-being is still in its infancy and studies remain limited; moreover while the broader social importance of waterfronts have been acknowledged by urban designers, these places are generally not recognised for their beneficial health qualities. There is of course no doubt that water environments are popular places. However in relation to designing for human flourishing, some research shows promising results for urban designers. An analysis of the health impact of two waterfront areas in Germany (Cologne and Dusseldorf) used a quadruplicate framework for investigation consisting of experienced space; symbolic space; social space and activity space. Each dimension was considered in relation to health-enhancing and health-limiting factors. The work concluded that overall health-enhancing aspects were dominant, these included indirect connection to the water - light and colour (blue), sound and smell - producing a feeling of freshness particularly on hot summer days; the fluidity and power of the rivers were also symbolically potent, encouraging a feeling of spirituality; the overall atmosphere that waterfronts created for socialising; and the vast array of active and passive engagement that waterfronts encouraged (VOLKER AND KISTEMANN, 2013).

² This builds on a previous 'Green Gym' initiative which encouraged people to exercise by volunteering in environmental work in green spaces such as parks and woodlands - The Green Gym Available at: <http://www.tcv.org.uk/greengym> (Accessed: 01.01.17).

³ BMI is a commonly adopted weight measure in overweight and obesity study. BMI = weight kg/height in m².



From a quite different health perspective a Finnish longitudinal study (2000-08) examined the proximity of urban green or blue space and reported Body Mass Index (BMI)³. The participants were public sector employees, employed in ten towns and six hospital districts. The study found that living at greater distance (>500m vs. <250m) from useable urban blue spaces was associated with being overweight in this group (though not with obesity). With regard to greenspace (>750m vs. <250m) greater distance was associated with both overweight and obesity. The study team concluded that urban blue and green features were beneficial in healthy weight maintenance, though the relationship between blue space and obesity levels was not explained (HALONEN ET AL., 2014).

This study was possibly unique in suggesting that living close to water is good for weight management. Although the relationship was not explained by the study the researchers also reported that physical activity levels alone did not explain the differences – it is therefore likely that the broader mechanisms of therapeutic landscape are at play here. Depression and other mental health issues have been linked to weight gain, the stress relieving, restorative nature of waterfront environments therefore may be crucial in this respect.

The Risks and Health Limitations of Water

While the evidence around the positive health impacts of blue spaces appears encouraging, it is also clear that blue spaces carry certain risk and limitations. Indeed it was work in the 19th Century by the English physician John Snow who mapped out the incidence of cholera outbreaks in London that led to the realisation that the urban environments in which people live and work are determinants of their health and well-being – in turn leading to the establishment of public health and modern town planning. Today waterborne diseases are largely a thing of the past in developed nations, but not entirely. Storm water runoff after heavy rain in particular can carry increased risks of contaminants which can lead to increases in bacterial levels. Studies in the US have shown, for example, that there is a direct link between heavy rainfall and outbreaks of waterborne disease such e.g. E-coli; and runoff can also reduce the effectiveness of some water treatments by increasing sediment in water which makes microbial contamination harder to treat. Moreover urban flooding appears to be an increasingly common event across the globe. Events associated with global climate change as well as increased building on areas associated with flood risk have contributed to the problem. Floods have been shown to have negative effects on mental health, increasing mental stress and depression (CURTIS, 2010) this can have broader impacts than just those

who have been directly affected, with whole communities concerned about future events. Individuals may face difficulties in obtaining insurance for buildings for example and within communities events that have happened several decades previously can still seem fresh in the mind, meaning that impacts may be long-lived and be a source of lingering anxiety and resentment.

Drowning in urban water courses is another concern. In the UK in recent years there have been a number of unexplained cases or urban drowning, particularly involving university students in cities with major rivers such as York, Bath and Durham. This has caused a national drowning prevention charity the Royal Life Saving Society to launch a 'Don't drink and drown'⁴ campaign (*Don't Drink and Drown* 2017). However while alcohol is implicated in around a quarter of all adult drownings in the UK, many deaths remain unexplained and while still uncommon the additional risk of drowning associated with urban water bodies does need to be acknowledged.

Skin cancer is associated with exposure of human skin to ultraviolet radiation (UVR) and while some UVR exposure is beneficial since it enables the body to synthesise Vitamin D (essential for bone, joint and muscle

Flooding, Carlisle, UK, 2016.

⁴ The slogan is inspired by a very famous 'Don't drink and Drive' campaign that has existed in the UK since the 1970s.



health as well as neurological function), excessive is responsible for around 90% of all skin cancer cases. The issue of skin cancer and otherwise therapeutic landscapes has been highlighted in the case of beaches, particularly in Australia and New Zealand (COLLINS AND KEARNS, 2007). This research suggests that exposure to risk many be an inescapable element of embodied engagement with landscape (ibid: p 29) moreover while waterbodies may increase people's temptation to expose themselves in urban areas to increased UVR whether this is to harmful levels has not been established.

While not an inherent issue with waterfronts themselves, the ways in which they have been developed in the recent past can be problematic. The areas can become expensive and exclusive enclaves, tourist 'honey-traps', simply orientated to commercial consumption (STEVENS AND DOVEY, 2004). It is conceivable that to those 'excluded' from this privileged world could be adversely impacted from not having opportunities to exercise to negative feelings of anger and resentment.

Implications for Urban Designers and Future Research

The need for urban designers to more fully appreciate the health and well-being impacts of interventions in the urban environment have been increasingly highlighted (see for example, BARTON ET AL., 2003; BARTON ET AL., 2015). Such work has focussed greatly on issues of urban form encouraging a return to more walkable neighbourhoods that integrate local shops, services, employment and educations opportunities with residential areas, provide high quality public realm and reduce reliance on private transport. Greenspace has been a major focus both in terms of quantity and quality as a location of physical activity, relaxation and socialisation. However such work has yet to fully engage with bluespace debates.

While the evidence is in its infancy, disparate and to some extent contradictory (for example in relation to whether bluespaces encourage

greater levels of physical activity or not) urban designers do need to be aware of this growing body of research. While waterside settings have long been appreciated by designers for their aesthetic qualities and generally as settings for both passive and active engagement the full importance of their health and well-being impacts have been largely over looked. While being aware of the risks that water bodies we need to maximise access – physical, visual and psychological. Thinking about how these benefits might be spread through society so that they have the potential to reduce health inequalities rather than reinforce them – for example with waterfronts only being available to those who can pay a premium - is also important. Working with communities is also important, particularly where flooding or other water related problems have been an issue – not all communities will necessarily be immediately embracing of the positive attributes of water.

However, while the current research provide some useful points and general points of principle, it lacks the depth and specificity that is really needed to be of use in practical design work. What is needed therefore is more research undertaken from a built environment/urban design perspective. More focus on the quality of bluespace and what attributes provide maximum benefit are needed. In-depth qualitative research on nature of bluespaces and perceived and measured benefits, as well as more longitudinal pre and post-occupancy studies of developments involving water bodies and those moving to and from waterside locations would be extremely useful.

Conclusions

Despite the existence of a large body of evidence that suggests urban waterfronts are beneficial to human health, wellbeing and flourishing, the field remains under-explored particularly from an urban design perspective. What evidence there is must be gleaned from other disciplines and in particular environmental psychology and more generally landscape preference research. Moreover while

therapeutic landscape research has increasingly recognised the value of 'everyday' environments, even here the role of blue space has not been adequately assessed.

Urban environments are the everyday environments for most people. Moreover our urban environments are increasingly implication in health and wellbeing problems, particularly lifestyle diseases. Water bodies are not without their own health concerns, flooding associated with climate change in particular is of concern. However there is inherent risk in all embodied engagement with environments. The research thus far would suggest that the benefits of urban blue far outweigh the dis-benefits and a healthier respect for our urban blue spaces in urban design is urgently needed.

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