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no 111
2020

Water

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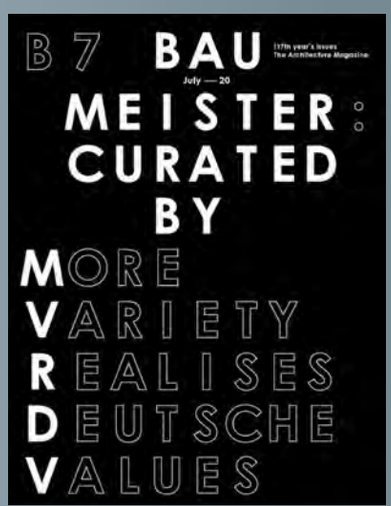

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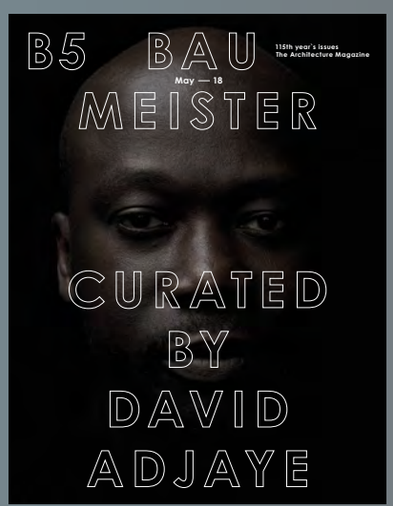

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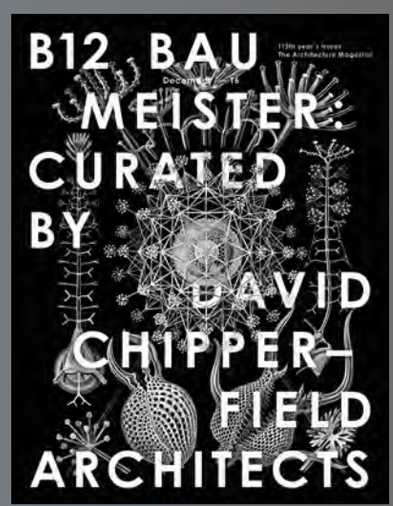

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no 111
2020

THE INTERNATIONAL REVIEW
OF LANDSCAPE ARCHITECTURE
AND URBAN DESIGN

Water


FOLK
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Front
DESIGN TANK PHOTO IVAN BRODY
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COVER

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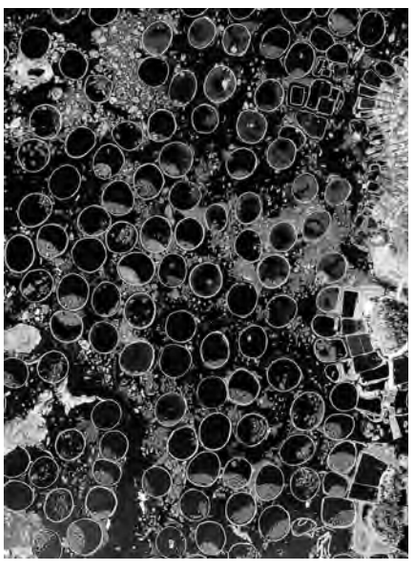

Viewed from above: Phumdis are naturally floating land masses that are used for fish-farming and to build houses on top of them. They spread across Lake Loktak in India. The local Manipuri people know how to generate sustainable and resilient design as their wealth of knowledge is millennia-old (p.58). How can we design sustainable, healthy and resilient waterscapes? What does water mean to us – as a resource, a design element, and as a vital part of our urban and rural landscapes?

TOPOS E-PAPER: AVAILABLE FOR YOUR DESKTOP

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Photo: Google Earth

Dear readers, let's talk about water. About the Janus-faced character of water. Water is life. Thales of Miletus, the ancient philosopher, for whom water was the source of all things, knew this. We all know its importance. Perhaps it's more apparent to those who don't have access to it. During the coronavirus crisis, water can even save our lives: We simply need to wash our hands. This brings us to an important dimension of water, i.e. the political dimension. Not everyone can find clean, healthy water, although the UN General Assembly recognises access to water as a human right. For his project African Waters, German photographer Florian Wagner travelled across ten African countries and documented exactly what this problem looks like: water is plentiful, but poor management makes its protection and equal access almost impossible. Water is also a special qualitative element of urban life. Urban riverscapes, for example, serve the recreation, health and well-being of those who dwell in cities. Such landscapes are economic areas, cultural landscapes, places of encounter. Little Island is to become such a place; a green urban oasis in New York's Hudson River Park, designed by Heatherwick Studio and MNLA on Pier 55, using the structural remains of the old piers as an inspiration. In New York City alone, more than 200,000 people live in a floodplain. And here we already have the other side of the coin: Water also means risk, threat and destruction. Both climate change and the heavy rainfall and drought that come with it, as well as the design and development of our cities to date – above all building construction and coverage – are forcing us to rethink: How does good, sustainable urban planning work, especially when it views water and its infrastructure as essential, multifunctional elements of design – as landscapes – while at the same time responding to these changing climatic conditions? De Urbanisten from Rotterdam have drawn up a water plan for the Belgian city of Antwerp that takes account of both aspects. It gives an inspiring vision of how the city has to approach future projects to get ready for a climate with larger extremes. The question above can also be applied to rural areas or islands: Ilan Kelman, for example, conducts research on Island Vulnerability. He says that "climate change must be factored into islanders' water management, but these decisions cannot be effective without solving the fundamental causes of the problems, namely our choices regarding where and how we live, and especially how we use water". So, the essential question is really about how we use water. How do we deal with this precious resource? How do we apply design to it? And what do we actually gain from it? Henk Ovink, Special Envoy for International Water Affairs for the Kingdom of the Netherlands, says that "investing in water creates opportunities in society. If the water world does everything right, the returns end up in society, with better health, food security, economic opportunities, less risks and more peace and equality". Perhaps – in order to achieve this – we should listen and look more closely to those who have time-honoured knowledge, people who have lived in harmony with nature for centuries and have adapted to its imponderables. This is what Julia Watson achieves with her approach Lo-Tek – Design by Radical Indigenism. Dear readers, the time to ask ourselves new questions, to be inspired by the new and the traditional, to change old habits, to rethink cities, landscapes, spaces and architecture, might as well be right now. The time to pay more attention to that which is really important. So, let's talk about water...

I wish you all the best. And stay healthy!

ANJA KOLLER
Editor
a.koller@georg-media.de

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Photos: Hubertus Adam(below); Heatherwick Studio/ LUXIGON

Sea Urchins under the Desert Sky

What do we see? Is it real? Or is it rather a movie set? Maybe a scene from Star Wars? Or is it just a futuristic, architectural Fata Morgana, one that architects would see if they were lost and dehydrated in the desert? Neither. It is The Buhais Geology Park Interpretive Centre, which lies approximately 50 kilometres south-east of the city of Sharjah, UAE – a region of prehistoric and geological significance. The site features an abundance of marine fossils from over 65 million years ago, mountain ranges and ancient burial sites from the Stone, Bronze and Iron Ages. Seeking to create a series of exhibition spaces in order to present the region's geological phenomena Hopkins Architects have designed five interconnected pods of varying sizes. The geometry of the pods was inspired by the fossilised sea urchins present on site. To minimise disruption to the existing fauna, geology and terrain, the pods were designed as pre-fabricated concrete structures and only gently touch the ground on in-situ reinforced concrete foundation discs. The pods are clad in steel panels, coloured to reference the different hues of the surrounding landscape as well as to shade the precast concrete structures. So, what do we finally see? A new, striking architectural milestone in the UAE, albeit not free from excess.

TEXT: Anja Koller / Hopkins Architects

Photo: Marc Goodwin

Werner Bätzing
Cultural Geographer and Alpine Expert

"IN LIGHT OF THE CORONAVIRUS, THE COUNTRY-SIDE'S PREVIOUS BACKWARDNESS APPEARS TO BE QUITE POSITIVE IN A NEW WAY."

In today's post-digital age, our economy and society are extremely unstable and small disturbances can lead to serious problems that endanger the entire system. The coronavirus – defined as a disturbance – is currently showing us how quickly a local epidemic can turn into a pandemic that threatens the future of both the economy and society, and thus our ability to live together. If the virus is most potent in cities, what does this mean for the countryside? Perhaps a new perspective of the city and the countryside will emerge.

Our society today is characterised by the fact that it is highly differentiated and specialised on all levels, i.e. the economy, infrastructure, our way of life and leisure. At the same time, a great many activities are broken down into their individual parts, which are often scattered around the globe. These parts have to be held together day after day by a huge movement of goods and people and a vast exchange of data and information. The very high efficiency of this system, which leads to low costs for both producers and consumers but puts a great burden on the environment and the general public, is inextricably linked to fundamental instability. This instability is especially evident in four main areas:

1. The extreme spatial divisions of labour, combined with just-in-time production (no warehousing), mean that a problem occurring anywhere in the world that disrupts production, traffic and/or the flow of data immediately affects the entire global economy as well as personal leisure time behaviour – problems in a remote region can easily have a global impact.
2. Our lives and economy are completely dependent on electricity due to technological development and digitalisation – without electricity there is no transfer of information, no jobs and no transport. Small disturbances in the power supply or targeted hacker attacks can quickly paralyse our lives.
3. In order to increase the efficiency of economic activity and the use of infrastructure, and to minimise costs, numerous reserves (capacity reserves in hospitals and factories, and personnel reserves for emergencies and breakdowns of all kinds) have been done away with in the last 20 years in accordance with neoliberal thinking. As a result, the economy and society are very poorly prepared for any exceptional situations.
4. The financial sector lives entirely from positive expectations for the future, because the repayment of existing loans depends on the continuation of future economic activity in a positive direction. If this is called into question, however, the loans very quickly become "bad loans" and the financial collapse that accompanies this can easily affect the entire economy.

Small disturbances in any of these areas can quickly lead to serious problems, which eventually can even endanger the entire system. Triggers can be natural hazards, accidents, wars, terrorist attacks, social conflicts, environmental problems, economic crises or pandemics. With the coronavirus, we are currently seeing how quickly a local epidemic can turn into a pandemic that threatens the future of our economy and society. It is not yet possible to predict how long this will last. However, everything indicates that it will continue to preoccupy us beyond 2020 and that living together as before corona will not be possible for some time to come. In the long term, this crisis may lead to central elements of our current economic activity and life – extreme specialisation, global divisions of labour, great distances between home and work, mobile recreation – being called into question. In such a situation, it would be reckless to concentrate solely on fighting the coronavirus and then want to return to "life as usual". Instead, it will become necessary to review and modify the four factors of instability mentioned above precisely because of their pronounced instability.

What we should also rethink is the relationship between urban and rural areas: In light of the coronavirus, the "progressiveness" of cities, which are very highly specialised and globally networked, is being called into question to some extent, while at the same time the countryside's previous "backwardness" suddenly appears to be quite positive in a new way. And a rural area that does not function as an extension of the city, but is decentralised and characterised by strong regional economic structures, could become an important factor of stability for cities in times of crisis. However, this reassessment of urban and rural must not be allowed to lead to a situation in which the countryside is only seen as positive and cities only as negative – such complete shifts from one extreme to the other have occurred time and again in the past, especially during times of crisis. They do no justice to the reality of the city and the countryside as two different but equally valuable forms of life that complement each other. Perhaps the corona crisis will help put an end to the current lack of appreciation of rural life and to ensure that our society also develops a new urban-rural relationship in the search for more stable forms of life.

WERNER BÄTZING, born 1949, was professor of Cultural Geography at the University of Erlangen-Nuremberg, Germany. He has been researching, teaching and publishing articles about the Alps for forty years. In his newest book "Landleben – Geschichte und Zukunft einer gefährdeten Lebensform" (Country life – history and future of an imperiled way of life) – only available in German – he elaborates on the perspectives, challenges and future of rural life in Europe and especially in Germany.

Steven Tupu

INTERVIEW: **Tanja Gallenmüller**

Steven Tupu is the founding principal of terrain, an award-winning landscape architecture office based in New York. Terrain works within an ecological context – each project, no matter its size, is part of a network of environmental and human connections. Born in New Zealand, Steven received his Bachelor Degree in Landscape Architecture with Honors from RMIT University in Melbourne, Australia in 1993. After his studies, he immigrated to the U.S. where he accrued over 10 years of experience before launching terrain in 2004.

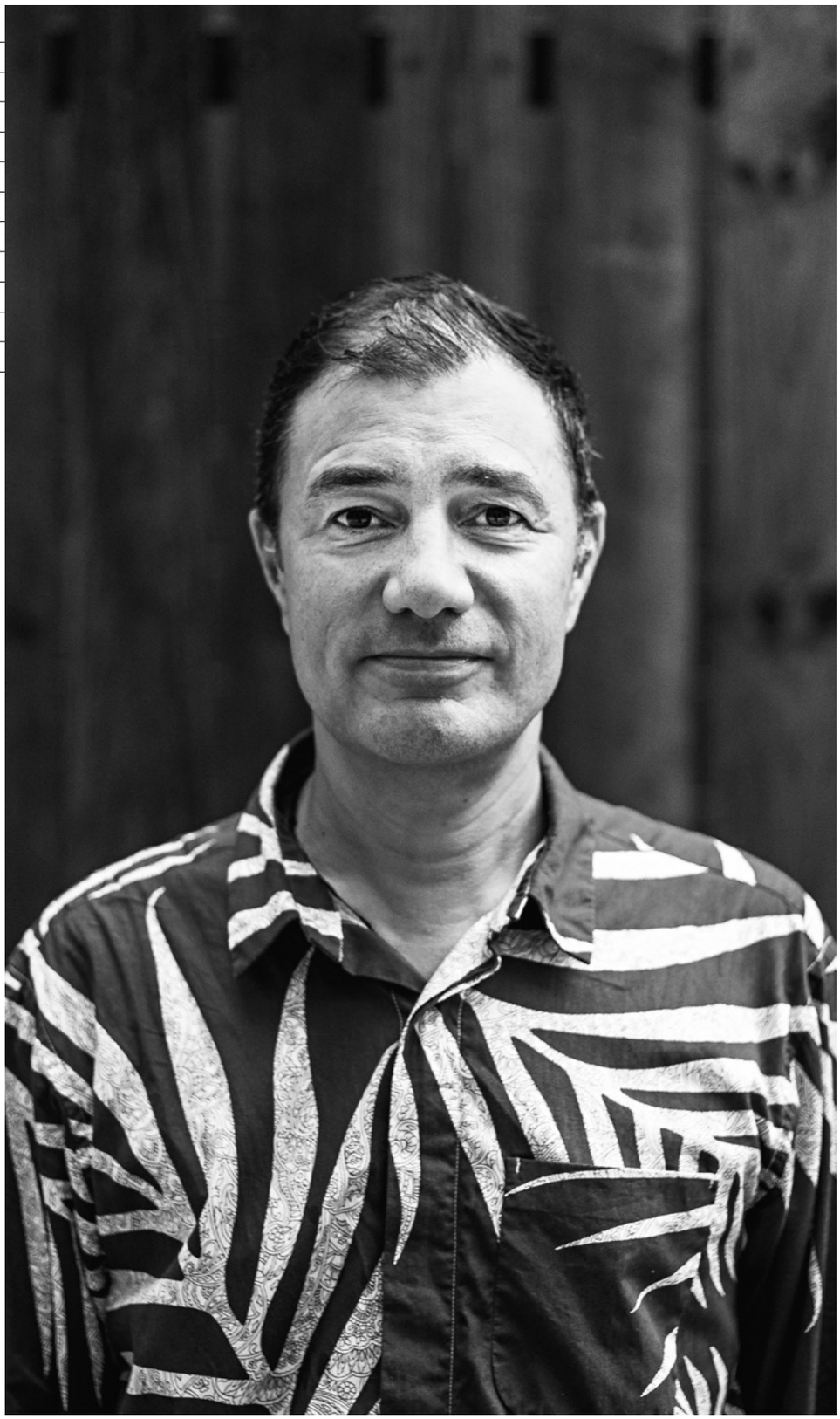

Photo: Joe Norman

1 CAREER STARTING POINT

Studying Landscape Architecture at RMIT University in Melbourne and being forever inspired by fellow students and professors.

2 INFLUENCED BY

My Elders, including my Samoan grandfather Tupu Folasa and my Kiwi grandmother Winsome Castle – both community leaders, makers and uniquely resourceful. Also, Carlo Scarpa, Vladimir Ossipoff, Ray Eames, Dieter Rams and Alexander McQueen.

3 WHY LANDSCAPE ARCHITECTURE?

I found the perfect combination of natural systems, gardening, urban life and craft.

4 DESIGN PRINCIPLES

Experience the site, listen, draw, collaborate.

5 WHAT'S YOUR SPECIAL FOCUS

Creating landscapes that connect people to the site and natural systems.

6 FORMULA FOR SUCCESS

Take risks – don't miss opportunities, they don't come often. Build and foster a great team!

7 OBSTACLES FOR THE PROFESSION?

Absence of creative risk taking and innovation.

8 WHAT ABOUT CLIMATE CHANGE?

Landscape Architects have the tools and expertise to make a difference – whether its through education, small-scale interventions or large-scale infrastructure strategies.

Thomas Balsley

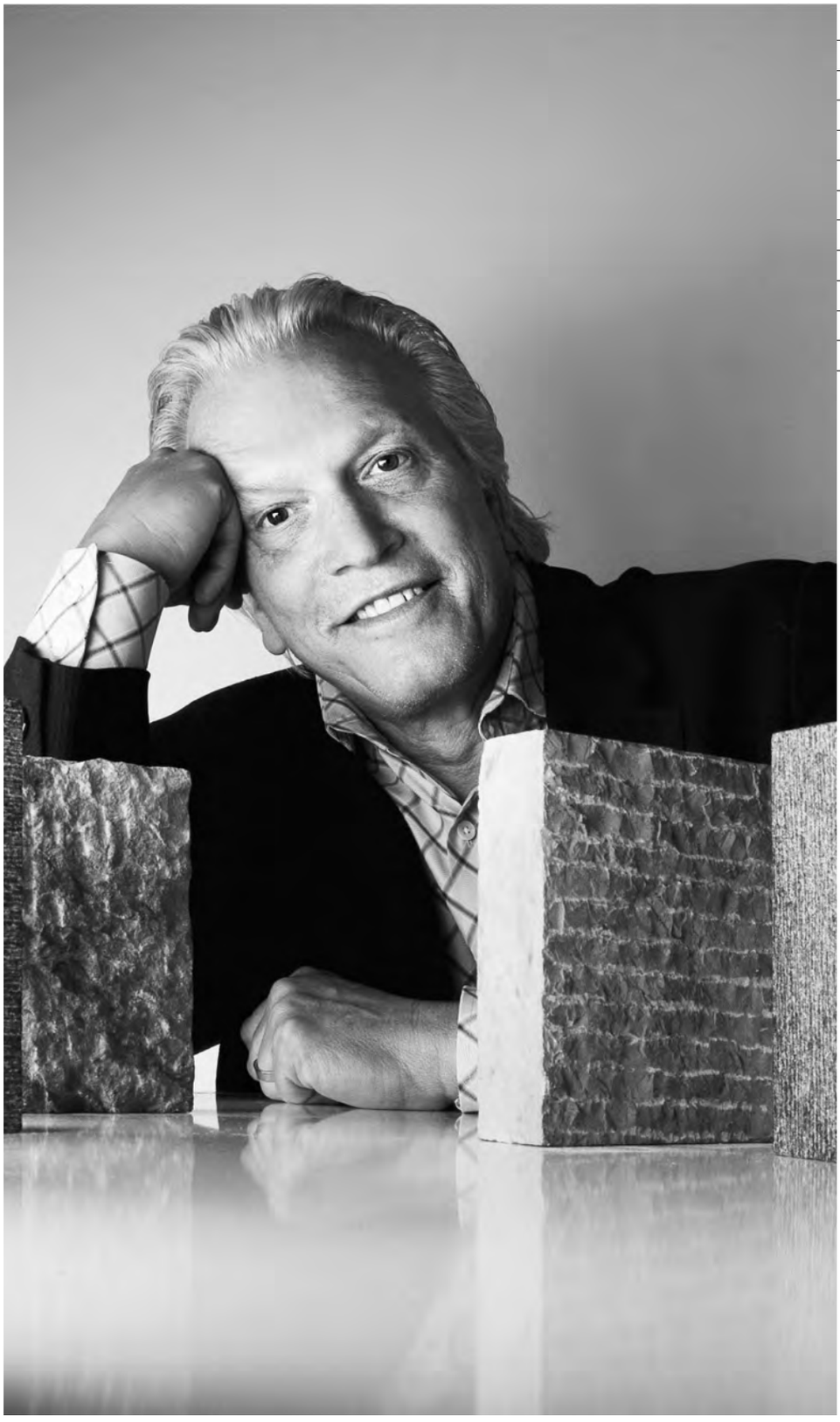

Photo: Courtesy of SWA/Balsley

Thomas Balsley, FASLA, leads his NYC SWA/Balsley studio's work in connecting people with place, each other, and the current culture of landscape urbanism. Tackling post-industrial urban issues since the 1970s, his pioneering, transformative, and provocative spaces, such as Hunter's Point Park, have sparked the public's imagination and underscored the significance of landscape architecture in the liveable resilient city. Tom is a recipient of the ASLA's National Design Medal. His work is documented in his monograph, *Thomas Balsley: Uncommon Ground.*

1 CAREER STARTING POINT

I started my practice during the recession years, spending more time understanding public design processes than finding projects or a design voice.

2 INFLUENCED BY

Paul Friedberg's gritty inner city works along with Carl Linn's environmental psychology.

3 WHY LANDSCAPE ARCHITECTURE?

It resonated best with my naturalist background, artistic talent, and attraction to the city.

4 DESIGN PRINCIPLES?

Our design process begins with the art of listening as stakeholders throw ideas in the pot and cook up the "bouillabaisse".

5 WHAT'S YOUR SPECIAL FOCUS?

Improving the quality of the urban environment and living in the city.

6 FORMULA FOR SUCCESS

Through trial and error, we have developed effective processes to synthesize the complex dynamics of public space.

7 OBSTACLES FOR THE PROFESSION

A bias in education towards natural systems and a distancing from the urban world leaves students ill-prepared for the challenges of our cities.

8 WHAT ABOUT CLIMATE CHANGE?

We must leverage our expertise into a place of leadership in the multidisciplinary collaborations necessary to address climate change impacts.

Rome

Last weeks' footage of Rome has a confounding familiarity to it. Its streets emptied by the government response to the pandemic, the eternal city seems to have finally honoured its reputation, suspended in a timeless state devoid of human life. Yet, the photos of the Spanish Steps, one of the city's most famous tourist attractions, only depict the final stage of a process already started in 2016, when the monumental stairway was cleaned as part of a costly Bulgari-funded operation. After the marble was returned to its original white, some suggested fencing off the area off and locking it overnight to avoid a quick return to old habits and dirt. The proposal was rejected, but then in June 2019 the municipality issued a ban on sitting, eating, or drinking on the Spanish Steps and other monumental stairways. While policemen monitored the steps, whistling at incredulous tourists, Roman intellectuals were divided between those in favour of protecting the monuments and those who considered the ban an overly authoritarian measure. This coming summer the debate will not arise again. Until last year Rome was the main tourist destination in a country that relies heavily on tourism for its gross domestic product. In the effort to monetise its historical heritage, the city has faced the same difficulties as other European tourist hotspots such as Barcelona, Amsterdam, and London. The city centre has become an open-air museum, where speculation has gradually forced out local residents and activities. A common example is Campo de' Fiori, the famous square where the 17th-century philosopher Giordano Bruno was burnt at the stake as a heretic. The only important square in Rome without a church, it was historically associated with the tension between Catholicism and secularism. It was a meeting place for hippies in the '60s and feminists in the '70s, and later it became very popular among foreign students and professionals (mostly American) in Rome. A couple of decades ago, despite the already numerous tourists, and the chaos often wrought by football fans on weekend nights, the area was still home to a lot of permanent residents. Every morning, they would stroll the market stalls set up at dawn by farmers coming from the city's outskirts. Now the market is still there, but no one is doing their grocery shopping there. Produce has been mostly replaced by souvenirs, fruit salads to go, and local delicacies. The clochards, artists and activists who used to populate the square have given way to weekend travellers and tourism workers; shops have turned into restaurants and bars, and apartments into short-stay accommodations. As the tourist area expands, a similar process is affecting other, not so central neighbourhoods as well. In Monti and Pigneto, for example, local movements are now recognising and strongly opposing gentrification. A notable example is the Ex SNIA, an artificial lake born from a real estate mishap and then reclaimed by the neighbourhood as a public asset. And yet, cases of angered residents fighting speculation in central areas are quite rare. For the most part, opposition to gentrification in the city centre stems from intellectuals who strive to save specific cultural sites rather than social movements opposing a broad urban phenomenon. In a city where the boundary between the centre and the periphery is far from being clear-cut, newer neighbourhoods' social fabric seems to reflect a stronger identification with the urban context. Have Romans given up on their city centre? Probably not. We just believe the identity of the city to be immortal. With our special kind of cynicism, we dismiss every change as temporary and insignificant, in the face of what the city has experienced in its almost 3000 years of life. But the eternal city is not eternal. On the contrary, its unique character is the result of the sometimes violent juxtaposition of different and transient identities: The authoritarian and the rebellious, the formal and the spontaneous, the new and the old, the devoted and the careless. This complexity, rather than the white marble of the Spanish Steps, is what needs to be protected – and not from an invasion by ill-behaved tourists but from the speculative, extractive and toxic relationship that tied them to the city. Perhaps the relaunch of the tourist sector that will inevitably follow the end of this pandemic can be used to set the course straight, allowing the city to coexist with tourism without losing herself in it.

Rome – the eternal city. To architect Chiara Dorbolò the Italian capital is anything but eternal. On the contrary, its unique character is the result of a sometimes violent juxtaposition of different and transient identities: The authoritarian and the rebellious, the formal and the spontaneous, the new and the old, the devoted and the careless. In times of the coronavirus a new identity has arisen and another vanished: The empty and the overcrowded. In a way, the absence of urban life brings Rome back to its promised eternity.

CHIARA DORBOLÒ is an independent architect and researcher. She studied in Rome and in Amsterdam and currently works as a contributing editor to Failed Architecture. She teaches architectural theory and practice at the Academy of Architecture in Amsterdam.

ROME

Map: SCHWARZPLAN.EU/OpenStreet-Mitwirkende/openstreetmap.org

Water

Dying Waters

Largely unnoticed by the global public, an environmental disaster is taking place in northwestern Iran: Lake Urmia, once the world's largest permanent hypersaline lake, is drying up. Iran's largest inland water body was declared a wetland of international importance by the Ramsar Convention in 1971 and a UNESCO Biosphere Reserve in 1976. For his series "Fading Flamingos", the German photographer Maximilian Mann captured impressive, almost poetic images of the disappearance and transformation of a landscape.

MAXIMILIAN MANN

Once the lake attracted visitors from all over the world. However, over time it has turned into a salty, barren land. The desiccation is accompanied by increasing sand and salt storms, leading to negative effects on the population's health and on the environment.

A dried-up tributary to the lake: Increased periods of drought and higher summer temperatures have accelerated evaporation.

For decades flamingos have been the symbol of the lake, which is also a large natural habitat of the brine shrimp, an important source of food for flamingos. Due to the increasing salt content of the lake the number of the shrimp species is decreasing. So, flamingos hardly find any food there.

Until a few years ago it was possible to travel by ship from one side of Lake Urmia to the other.
Due to the low water level this is no longer possible.

Loss of biodiversity: A man feeds fishes in a trout farm in the village of Karimabad. Due to the increasing salinity, the lake no longer contains any fish species. As a result of that, there has been a fast increase in aquaculture production.

A dysfunctional landscape: In the past, the beaches around mountain Kazim Dashi were a popular tourist attraction. Since the lake has started to disappear, fewer tourists come to enjoy beach life.

United by suffering: Reza (front) and Ahmed (back) live in Urmia. Both men own a field near the village of Bari, directly located at the lake. Before wintertime comes they burn agricultural waste.

The village of Gurchin Qaleh with its less than 600 inhabitants is one of many small settlements that are shrinking. Thanks to the United Nations Development Programme (UNDP) the village centre was redeveloped and renovated to give the people a higher quality of life.

Photos: Maximilian Mann

FADING FLAMINGOS

For more information about the work of Maximilian Mann please go to:

https://maximilian-mann.com/Fading-Flamingos.

Maximilian Mann travelled to Iran three times, in summer and autumn 2018 and in January 2019. The young German photographer is convinced that environmental and sustainability issues are the key elements of his generation and affect the future of us all. He received numerous awards for the photo series "Fading Flamingos" – in 2020 the World Press Photo Award in the Category Environment (2nd prize).

Where ten years ago waves splashed against the walls of the villages, today you see an almost endless salt desert. Ships that once carried people from one side of the lake to the other lie on the shore like stranded whales, decaying. Salty winds from the desert are spreading further and further across local residents' fields, causing their crops to dry up. Deprived of their livelihoods, people are fleeing to the surrounding towns and cities, and the villages around Lake Urmia are dying out.

In the 1990s the lake was still about twice as large as the whole of Luxembourg. Increased periods of drought and higher summer temperatures have accelerated evaporation, however. In addition, thousands of illegal wells were built and through a large number of dams and irrigation projects along the lake's tributaries, the water was diverted to agricultural fields. Studies done in 2014 showed that the area of Lake Urmia had decreased by 88 per cent since the 1970s. In addition, scientists and environmentalists have long warned about the negative effect of causeway construction – in 2008, for example, a 15-kilometre-long causeway was built for automobile traffic, dividing the lake in two. Scientists say it obstructs the natural flow of water between the two sides of the lake, resulting in more dehydration and drought.

Dehydration also affects food sources for migratory birds such as flamingos, which were considered the symbol of the lake for decades. Due to the enormous increase in salt content, however, the animals are finding fewer and fewer Artemia or brine shrimp and are avoiding the region. The lake is both a source of food and a home for about 200 different bird species, all of which are being now at mortal risk.

Time is running out. If this disaster is not stopped, up to five million inhabitants could be forced to leave the area in the future. Iranian President Hassan Rouhani has now also recognised this, and five billion US dollars have been promised for the revitalisation of Lake Urmia over the next ten years. In addition, the United Nations Development Programme (UNDP) is supporting local people in their efforts to rebuild the wetlands around Lake Urmia and manage them more sustainably and ecologically. There is another hope for salvation as well: Due to torrential rainfall in April 2019, the lake's water level has recently risen again. And the first flamingos have been sighted as well.

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“Water is the Driver of Change.”

We meet Henk Ovink, the first Special Envoy on International Water Affairs for the Kingdom of the Netherlands, at his home office. Ovink is responsible for maintaining good relations with foreign governments, knowledge institutions and civil society organizations around the world and initiates cooperations with the World Bank, the United Nations, the OECD and the EU. He previously served as the Senior Advisor to the Hurricane Sandy Rebuilding Task Force and was Principal of the ‘Rebuild by Design’ initiative. topos spoke with him about the potential of water to both connect and disrupt and putting water back into the hearts and minds of people, for their own wellbeing.

INTERVIEW: MARK KAMMERBAUER

topos: What has Henk Ovink been doing since being appointed as Dutch Envoy for International Water Affairs?

OVINK: Five years ago, I was appointed for a term of three years, and I was reappointed after a mid-term evaluation. I'm now in my sixth year, and that will be the last year of my second term. We'll see what happens next, but it's been a rewarding journey. And also, a challenge, because there was no precedent, there was no predecessor, there was no other water envoy. There really wasn't anything to refer to when the position came out of the assessment that water is critical for everything – for economy, for gender, for health, as we see now with the coronavirus crisis. And take climate, cities, food or security: the awareness of water – and its importance – is still low. It is low in society, it is low in government, it is low in business and it is low in the financial sector. The question arises, how you can raise that awareness and the understanding of it, in order to build capacity and be better prepared in the context of climate change, and at the same time deliver on the Sustainable Development Goals? 2015 was the year when we set up these goals. 2015 was also the year of the Paris Agreement. Today, we're still influencing that agenda and working on its implementation.

topos: How do you promote a better understanding and awareness of issues surrounding water?

OVINK: I have three roles to strengthen our actions. First, I'm focused on raising awareness, by research, in building coalitions and through advocacy. Second is my work in post-disaster settings and assisting communities and institutions in recovery and resilience planning and investments, all in conjunction with the implementation of the 2030 Agenda for Sustainable Development. And third is about how to innovate, to accelerate and scale up our efforts, through a water approach – knowing that the gap between what we want to achieve and where we are today is still huge. How do we do this, how do we get this done, which transformative approaches, projects and coalitions are needed? Over the past five years, I helped to set up – and was also Sherpa of – the High-Level Panel on Water, with eleven heads of government, heads of state, the Secretary-General of the UN and the President of the World Bank. I've worked with schools around the world to increase water awareness. Awareness starts with better understanding. To help to increase that understanding I initiated a large research program that resulted in the publication titled "The Geography of Future Water Challenges", where we described all these water challenges and their interdependencies. For an increased understanding of these challenges, interdependencies and opportunities, we have to show the geography. In geography, things come together. Although we know this, many people do not yet understand this. When you put together health, biodiversity, climate change, economy, urbanization, migration, all of it, on a map, you can see: there are the hotspots, where too much, too little and too dirty water come together with our economic, cultural, social and environmental needs! That is the moment when our understanding can – and must – lead to a change of course.

topos: In which areas do we need to push forward to turn awareness into action?

OVINK: We concluded on four pathways forward: cities, drylands, where there is no water, deltas and rivers, and transboundary waters, where water crosses systems, manmade and non-manmade. We need to focus on these pathways and understand the systems to determine what to do, in policy, regulations, governance, coalitions, investments and innovations, to increase our impact, to reach our ambitious goals. Raising awareness is more than a campaign, it is working with everyone, aimed at brokering opportunities for sustainable development. But the real work is in the programs and projects, post-disaster settings, in conflict regions, around the world, in Latin America, Africa, Asia and the Middle East. Bridging the gap between our ambitions and needs means innovation is important, means moonshots and leapfrogging while leaving no one behind. To better understand this part of my work I undertook research for President Obama's Hurricane Sandy Rebuilding Task Force, and together with researcher Jelte Boeijenga wrote the book titled "Too Big: Rebuild by Design's Transformative Response to Climate Change". All of this led to my latest initiative, a new innovation program, called "Water as Leverage for Resilient Cities."

topos: You already painted the broad picture here! You mentioned that awareness is still low. But it also seems that the picture isn't too abysmal, since good things are happening. So, what is the state of water affairs today?

OVINK: Water connects social, cultural, and environmental challenges. Without water, women and kids walk to the wells for hours every day, not contributing to the development of their communities - while they are more entrepreneurial than men. This increases the gender gap and their economies suffer without sanitation and water. Without proper sanitation in schools, girls often experience monthly dropouts, in times of their period, setting them back even further. The lack of water and sanitation is directly linked to hygiene and health. As we see now with the coronavirus, it's about washing your hands as a first line of defense! But without water, how can you even wash your hands? And in the response, water – through its connective capacity – can be the best asset for sustainable recovery. Water is the driver of migration, with climate change even a root cause for conflict. Taking stock of where the world stands when it comes to water security, it's not going well, although there is more awareness. Due to climate change, that awareness comes, in my words, "by default and by disaster" – because we fail. We see more of the impact of our failure, with more refugees, more floods, more droughts, more casualties, more despair. And because of that, we become more aware of how important water is. It almost seems as if we need these failures, these disasters, to increase urgency and to help to change course. Across the world, people are better in response measures than in preparedness, because preparedness can be abstract. Prepare for what? The moment the disaster strikes, you know what to respond to, you know what to do.

topos: It's no longer hypothetical?
OVINK: Yes, right! It is everywhere, everyday. We can't look away.

topos: Water poses both risks and opportunities for cities. Given what you just described, and also the impact of climate change, have the scales shifted more towards risks? Or are there still opportunities?
OVINK: Interestingly, both. Risks are greater, because the climate is changing more rapidly. Also, cities continue to grow. When communities are marginalized, the growth of cities doesn't necessarily result in increased opportunity for all. There are divided cities, there is a social gap, a gender gap, an equity and equality gap. Climate change hits the most vulnerable hardest and longest. Their risks are increasing. We can't forget, the weakest link must be our first priority. At the same time, you see more and more opportunities in cities, because everything comes together there. In the places where I work, in the programs I set up, we connect the dots from the beginning, in a holistic, integrated way. Looking across the Sustainable Development Goals – a very comprehensive agenda – from a social, cultural, environmental and economic point of view, you see: Connecting the dots lets opportunities arise. And in these opportunities water is the driver of change. Investing in water helps mitigate risks, it helps reduce heat, it helps recharge the aquifer, it helps get more redundancy and resilience into the system. Integration also means inclusion, leaving no one behind, including all stakeholders, partners and individuals from the beginning to the end. This builds social, environmental and institutional capacity. Water is really the leverage for sustainable development, the enabler for action. There are more opportunities now, because we are more aware, we have a far better understanding, and we have built capacity among many.

topos: Water still has the capacity to connect people and place?
OVINK: Yes, it does. Wherever people live, is where water brings us together. It is either for the quest for water, to clean it, capture it, withstand it, or withhold it. When there is enough, it is good for our economy, to drink, for food, for our health and prosperity. The geography of future challenges is also the geography of future opportunities.

topos: When we speak of the city-water-nexus, you could argue: if it is resilient, it is certainly good. But I'm wondering, if the connection is good, is it also resilient?
OVINK: That is a fair question, and I would say yes, in the sense of what I find good. That is something I determine in the full context of the 2030 Sustainable Development Agenda, looking at all seventeen goals. Cities have their own goal (SDG 11), but it doesn't help if you put the SDGs into silos, if you parcel them up. The sustainable development goals are a holistic, connected, integrated agenda. If I look at the full agenda, and look at the water-city-nexus, then I see: this nexus is about social capacity, about education, inclusion, and institutional capacity. It is about the rule of law, best governance, and infrastructure. And also about building with nature, so nature's capacity in cities increases, reducing climate change impacts and mitigating climate change by minimizing the carbon footprint. Water plays a key role in greening our urban economy, in capturing energy, in recharging our aquifers, in making our rivers – that run through our cities – and our soil and groundwater healthier. Yes, that is a grand definition of good. But, if you make it smaller, there are consequences. There might be different ways of measuring good or resilient, or validating the water-city-nexus. In my perspective, in the full context of the 2030 Agenda, yes. In that nexus, resilient and good are in the same trajectory.

topos: Let's look at the opposite. What are the biggest challenges or hindrances in achieving resilience in the built environment?
OVINK: This is a bigger story. It is almost unimaginable from a professional point of view, from the point of view where you become aware that we actually invest trillions of dollars in our cities and our economies, through solutions in infrastructure, interventions that come from the past, that make us more vulnerable and that are unsustainable. But it is true, and this relates to my nightmare, that there is still a business case for "stupid infrastructure". If it's for short term financial return or for profit, we call it a business case. But we forget to look at the negative impacts in the mid or longer term. With single focused infrastructure, there certainly is economic gain in the short term. But if you increase the scope, the scale, and the time, you see: That new road actually destroys habitats, cuts across a place where people live, and actually drives the emission of carbon, a pollutant. The growth at the end of the road, if not done sustainably, also causes damages, and so forth. If you don't choose a longer term, holistic, comprehensive approach, and think about values and the return on those values across the different aspects – next to finance also the bigger economic aspects, culture, social dimensions and the environment - and only look at financial gains, then there is a business case for being non-responsive. Because we invest so much in stupid infrastructure and in the things that are unsustainable, we destroy biodiversity, increase climate change, and increase the number, magnitude and impacts of disasters, making us even more vulnerable day after day. One thing is very interesting: we are pretty good at response measures, even become better, by practice and experience. There you see a type of resilience aimed not only at building back but building back a little better. It is a step, but it's still part of not being prepared, of responding to the disasters of the past. Incremental change will not help us to reach the SDGs and the goals of the Paris Agreement. For that, we need a far more proactive stance, an approach that is more strongly oriented on preparedness and aimed at the future, not the past. If we continue to act non-responsively, a financial business case will continue to exist, for our work and for stupid infrastructure. When we respond to the disasters, and make things a little bit better, this is only an incremental change and not the systemic change we require so much. If we want to reach our goals, we have to be proactive, and from a systems perspective, that has to be catalytic.

For Henk Ovink, water connects economy with ecology. But the disconnect is disastrous in our current practices. How can we re-connect people and place, urgency and preparedness, economy and ecology?

Photo: Henk Ovink by Cynthia van Elk

VITA

HENK OVINK was born in The Hague, The Netherlands, in 1967. He studied mathematics, art and architecture. Ovink was appointed the first Special Envoy on International Water Affairs for the Kingdom of the Netherlands. Furthermore, Ovink was Senior Advisor to both the former US Presidential Hurricane Sandy Rebuilding Task Force and Principal of Rebuild by Design. Rebuild by Design convenes a mix of sectors – including government, business, non-profit, and community organizations – to gain a better understanding of how overlapping environmental and human-made vulnerabilities leave cities and regions at risk.

topos: What can planners and designers do to achieve resilience? Looking at your experience, which specific aspects would you recommend to planners and designers?

OVINK: There are three aspects where planning and design really play an important role. The first aspect is that we need solutions, we need interventions that make the world a better place. And planning and design are really solution-oriented, they are about creating a place, creating a world, creating infrastructure, creating opportunities. With their solution-oriented capacity, designers and planners are critically important. Second, design in itself has the capacity to connect, because it is place-based. It brings together social, cultural, environmental and economic values, interests and needs. So, design already connects these needs and challenges and opportunities. Design not only cuts across interests, needs and challenges, it cuts across scale; looking at the challenges from a systems perspective, from your front yard to your neighborhood to a river delta or river basin across borders. And design cuts across time, because design can learn from the past, and within scenarios, it can explore the future, to define what we can do today. So, design has this capacity to span boundaries; across interests, across scales and across time. Third, design is inspirational and aspirational. It inspires, and with ambition: there is a narrative, there is a future, there is a story to tell by design, which means design is political, it talks to society, to people and partners and institutions. It helps us to think about the future and envision the future, and therefore be ambitious and give hope. Again. One, it's solutions. Second, it's connectivity. And third, it's politics. Increasing that capacity more and more in the context of the challenges we face, the places where we work, moving from non-responsive to responsive to proactive, is where we want to see design go.

topos: Since you mentioned transformation, are resilience and transformation complementary, or are they contradictory? Are they sometimes at odds with each other?

OVINK: There is a part of resilience that is about redundancy. But that really requires that we determine what resilience is. Some people interpret resilience as being redundancy, meaning there are enough resources in the system so you can always bounce back. But that is only flexibility. Resilience in itself is fluid, it's already on the run. There is always speed, it looks at the next stage. Resilience is always future-oriented and that means it has to be transformative. For many people it is redundancy-plus. But in that case, it is not transformative. It remains as-is and bounces back. If it is really resilience, it is not only bouncing back, but bouncing back better, learning, and transforming to bounce back again. So, it's really a learning and growing approach.

topos: Let's look at your work with Rebuild by Design. I had the feeling that it would lead to a "resilient turn" in planning and design. Does that still hold true?

OVINK: I do think so. When we developed Rebuild by Design, it was new. First, what I really like is that it is still alive. It is an NGO, I sit on the board, and it continues to evolve and be very active. And second, it was replicated. We had the National Disaster Resilience Competition, Resilient Bay Area, we had Resilient Singapore, Vancouver, you name it, it happened. Resilience 'by design' works around the world. There is a resilience university program, there are design workshops, adaptation academies and so forth. The word resilience already existed before that, and there was a whole narrative surrounding it. Back then, we talked about social, physical and cultural resilience. Its innovative capacity was disconnected, it was manifest in different worlds, almost as if you had an environmental world that was talking about ecological resilience and a social world that was talking about social resilience and a financial world that was talking about financial resilience, at most. Everybody talked about resilience from within their own silo. And by design, we opened up those silos. We made the connections, put the people and the challenges and the different needs and opportunities on the table and said, OK: by design, we are going to help tackle sustainability and climate change. By design, we will bring all the people onboard. By design,

we will trigger catalytic action and achieve resilience. And what we see now, is that there is a far better understanding in the places around the world how that may work.

topos: How do you see the post-Sandy recovery projects today, what do you think went really well and where would you change something?
OVINK: In April 2014 we presented the results of Rebuild by Design to the world and started an evaluation to inform the National Disaster Resilience Competition. We selected the six plus one winners and worked with the US Department of Housing and Urban Development and the grantees to help move these towards feasibility and implementation. Two years after the presentation of the winners, we wanted to take stock and check. Were these innovative projects – while challenging the existing limitations of policy, politics and procedures – really moving towards implementation? We needed to track their progress: Rebuild by Design started from the need to escape the boundaries, the lock-in within the institutional world, to be able to drive innovation and resilience. So, the projects purposely did not fit the system, they challenged it. In 2016 we saw that some grantees had started to take them apart, to slice them up so the individual parts could fit the system again. These very comprehensive, holistic projects were taken apart to fit the silos of the bureaucracies: parks, infrastructure, housing, public space or whatever. This was a challenging assessment, but it not only helped the teams, the communities and us. It also was – again – a wake-up-call for the grantees: wait, they said, we want to innovate, and we want to build back better, inclusive and holistic, so we can't take the projects apart. It all takes time, urgency and patience and it has to be matched. Half of the projects were supposed to break ground this year, and the other half is in the process of getting there.

topos: What is going to happen in the future? Where are we going from here?
OVINK: The coronavirus crisis is a factor. It really exposes our vulnerability. The way we live contributed to this situation, and the future will hold even more and more of such crises. Not in one single place, but across the world, the global economy, and across societies, exceeding the scale of a country, bigger than something we can think of. This pandemic really amplifies the question how we want to inhabit this planet. How do we keep up with this, how can we be ahead of this? Understanding and awareness are rapidly increasing. However, will it help us to determine our next steps, and how; will we learn fast enough to act upon that understanding? There is an amazing set of examples, from communities, governments, businesses, that step up and step in; reducing carbon, changing course, gaining resilience, redesigning neighborhoods and doing everything differently. Nevertheless, if you look at it from a financial perspective, where does the money go? It is all about economic recovery, saving jobs, not lives, society or the environment. And with that focus, the majority of these funds goes to the economy of yesterday, saving vested interests, instead of investing in the future, the new world. Resetting the economics of sustainability and resilience will be critical, to bring about the recovery and set the ambitious agenda and prepare the world: we must take this opportunity, this crisis can't be wasted. And for that, we need design. We need to show that the better and best projects are also better and best investment opportunities. Why? Because it is about creating values and investing in water is a fantastic example of this. It also shows how tough it is. If the water world does everything right, the returns end up in society, with better health, food security, economic opportunities, less risks, more peace and equality. Investing in water creates opportunities in society. Understanding these interdependencies is going to be critically important in moving forward. If we don't become better in defining the business case of these holistic, long term ways of capturing values, if we stick to our stupid, infrastructure-related evaluation and validation criteria, we will lose big time. I am hopeful, because we see the benefits of clean air and a clean environment, the reduced impact of storms and droughts, and greater security for our kids and grandchildren. We see the benefits of being a little bit saner. There is an economic return in the mid and the long term, there are immediate societal returns and increased values; equity, equality, inclusivity, health, empowerment, partnerships, security and a safe and clean environment. We don't have the time that it might take, but before we realize we're already changing course.

topos: You already mentioned differences between developing and emerging countries, in relation to social inequalities and aspects such as gender. Looking at the Global South and the Global North: what needs to change in that relationship to achieve the advancements you have spoken about?
OVINK: The divide is devastating. While we are all different, we also are all equal. Only an inclusive approach can cut across scales: an inclusive approach in your community is also an inclusive approach on a global scale. And the coronavirus, again, makes this really clear. ODA, official development assistance, is directly linked to the GDP. There is a reason for that from an aid perspective, in terms of the need and the ambition. But it was never meant to be a maximum, it should work as an investment ceiling. Because of this perverse mechanism, the first thing that happens with GDP losses is cutting on ODA: stupid. The weakest link is the one we must protect the most and strengthen first and longest. If we continue to think of a divided world, with a developed and a developing part, we're lost. The most vulnerable places are hit hardest, and those are the places where there is no water, and no food security, there might be conflict, increased migration and inequality; in other words, vulnerabilities across all the SDGs. And on top of that, this incredible COVID-19 pandemic and the resulting massive health emergency. If we don't do everything we can to prevent a humanitarian disaster in Africa, Central Asia and in our refugee camps, we will all feel it. First, solidarity must be key, as UN Secretary-General Guterres said. Second, we have to rethink the economy, learn from this crisis, and move away from short-term gains, vested interests and regressive policies. Together, not only in the West, but across the world. Third, learn from the economies and

communities in those regions around the world that we call emerging economies, developing economies. They have the capacity to change course, they already lead in this global transition. They are the future. International aid budget cuts in the past have sparked the idea to move from aid to trade, which is stupid. It is not about 'from giving to taking', no. And yes, there is an urgent need to become less dependent on aid, to become partners in development. That is not 'trade', that is how to co-invest. If we really believe the world is worth living in, together, then we have to stick to that promise and invest in the people and the places that are at risk, now, and offer opportunities tomorrow. Don't think of it as aid, which is a form of colonialism coming from the past. Think of it as a partnership and a co-investment approach. Not easy, and a lot needs to change everywhere, which means that both sides have to figure out the rule of law, gender equality, equity, economic opportunity and so forth. There is no one model, but there is a shared agenda of values and goals: the 2030 Agenda for Sustainable Development. Every place in the world is subject to that change, not only the developing world, but really everybody. So, change needs to happen everywhere and with everyone, leaving no one behind; institutional change, physical change, and cultural change.

topos: The Netherlands are a role model in terms of dealing with water and the environment and where people live. Does that mean that other people and places need to become a little bit more Dutch? Or do the Dutch also learn from others in this regard? Is the solution that both co-evolve, co-learn, co-produce?
OVINK: Of course, the latter. There is no Dutch approach. What we do have is a culture of living with water, which has brought us the capacity to work together. Living with water didn't start with engineering and design, but with collaboration. Our Regional Water Authority was our first water democracy, in the 12th century, 900 years ago. That was not like a city council, nor a senate. It was a table where every stakeholder had a seat. Today, it really is a collective effort to protect your and your neighbors' houses and businesses from floods, droughts and pollution. This is perhaps where we can inspire the world best, with this inclusive, collaborative and accountable approach that implies holistic and future oriented measures. Indeed, we therefore value water differently. I guess this valuing of water, when we look across social, cultural, environmental and financial values, is our baseline. It reflects our governance, how to take care of our natural resources and our groundwater. Valuing water defines our approach, the process, not only as comprehensive and holistic, but also inclusive. By looking at the longer term, while connecting it to shorter-term actions. The other inspiration is innovation, so much part of this Dutch culture of living with water and empowering everyone. I don't think we should all become Dutch but must invest in ways to collaborate better. We learn a lot from the world, from the deltas in Asia, from the drylands in Africa, from the cities in Latin America. From the rivers across the world, from indigenous peoples, from older and younger cultures. Innovations from across the world. We are eager to learn because we value water and our future. Solidarity and partnerships are critically important, if we want to leapfrog into a better future. Everybody can do his or her part, everyone needs to become better at sustainable development. Collaborating together starts with listening, asking questions, pausing before answering, investing in each other before we invest in infrastructure. The collective is always more than the individual is, and this commonality always aggregates value. That is relevant, that is what I believe in, and that is what we can bring to the global table.

topos: You might have seen the project proposal on enclosing parts of the North Sea with dams to prevent certain areas from being subject to sea level rise. Do you have an opinion on that?
OVINK: We can't engineer our way out of this climate change disaster. We have to mitigate climate change first, we have to reduce our carbon footprint massively, and we have to make sure we stay within the limits, the ambition of the Paris Agreement. We'd better get to a world that is no warmer than 1.5 degrees. This should resonate with everyone. This is not about sea level rise alone. Do you really think this world will be a great place to live in when it is 4 degrees warmer? No! An approach to cut off the North Sea is a one-dimensional approach. Not based on systems thinking, neither from an ecological, a geopolitical, social, nor a cultural point of view. I think, if you look ahead and if – God forbid – we end up in a world that is two, three, four, five degrees warmer, and SLR happens, we will live in a completely different society. Europe will be unrecognizable. I think the whole institutional setup of this continent will be different by then. Nevertheless, I think it isn't inevitable. We have these 200, 300 years projection graphs, and we still have every opportunity to prevent this from happening. We must. We can.

topos: What does all this mean for water culture, and is water culture synonymous for human culture?
OVINK: Water stands for so many, if not all aspects of human life. I don't want this to become a semantic thing, because the Water Ambassador says so, but everything is indeed about water, that is not a problem, that is our best opportunity! Water is a global challenge: there is not enough, there is too much, and it's polluted, often connected in place and time. It is on us, as humans to change this. Water has the amazing capacity to connect people and interests and places and opportunities. It really is a leverage for sustainable development. And with that, water is culture, it is our culture, and is an amazing culture. And I really hope this can inspire people. Not because water is siloed, or put in a corner, but because water likes to connect. And in that sense, the physical form of water is also a metaphor: if you walk in the rain, you get wet. If you swim in a river, you're immersed. It bends, takes curves, goes left or right, whenever you try to withstand and obstruct it. Water knows its way and invites you to travel along. You only have to know your way around it!

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Water

Born from a collaboration between UK-based Heatherwick Studio and New York-based landscape architecture firm MNLA, the park's design offers all New Yorkers and visitors a new public space that is whimsical, captivating, and restorative.

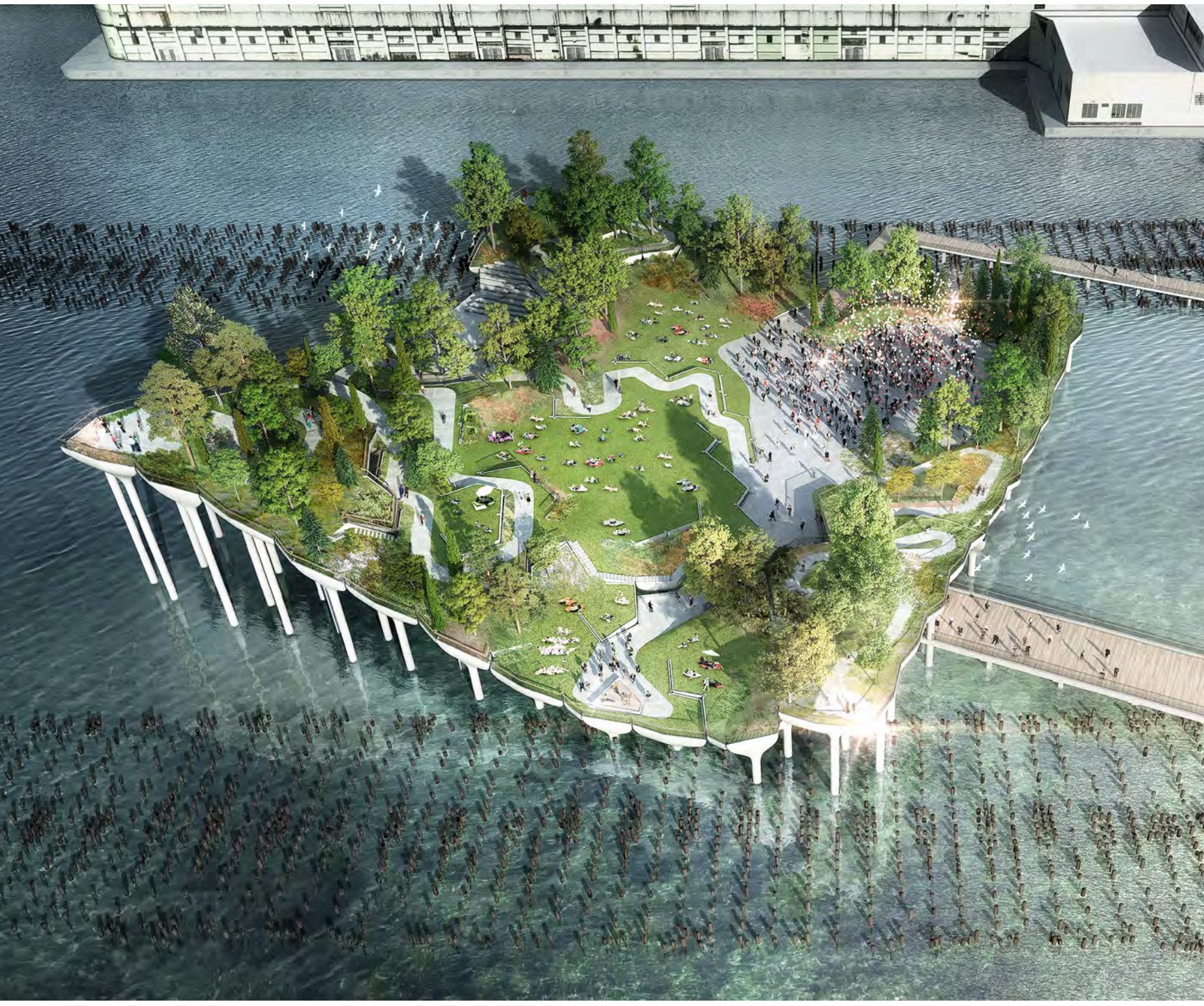
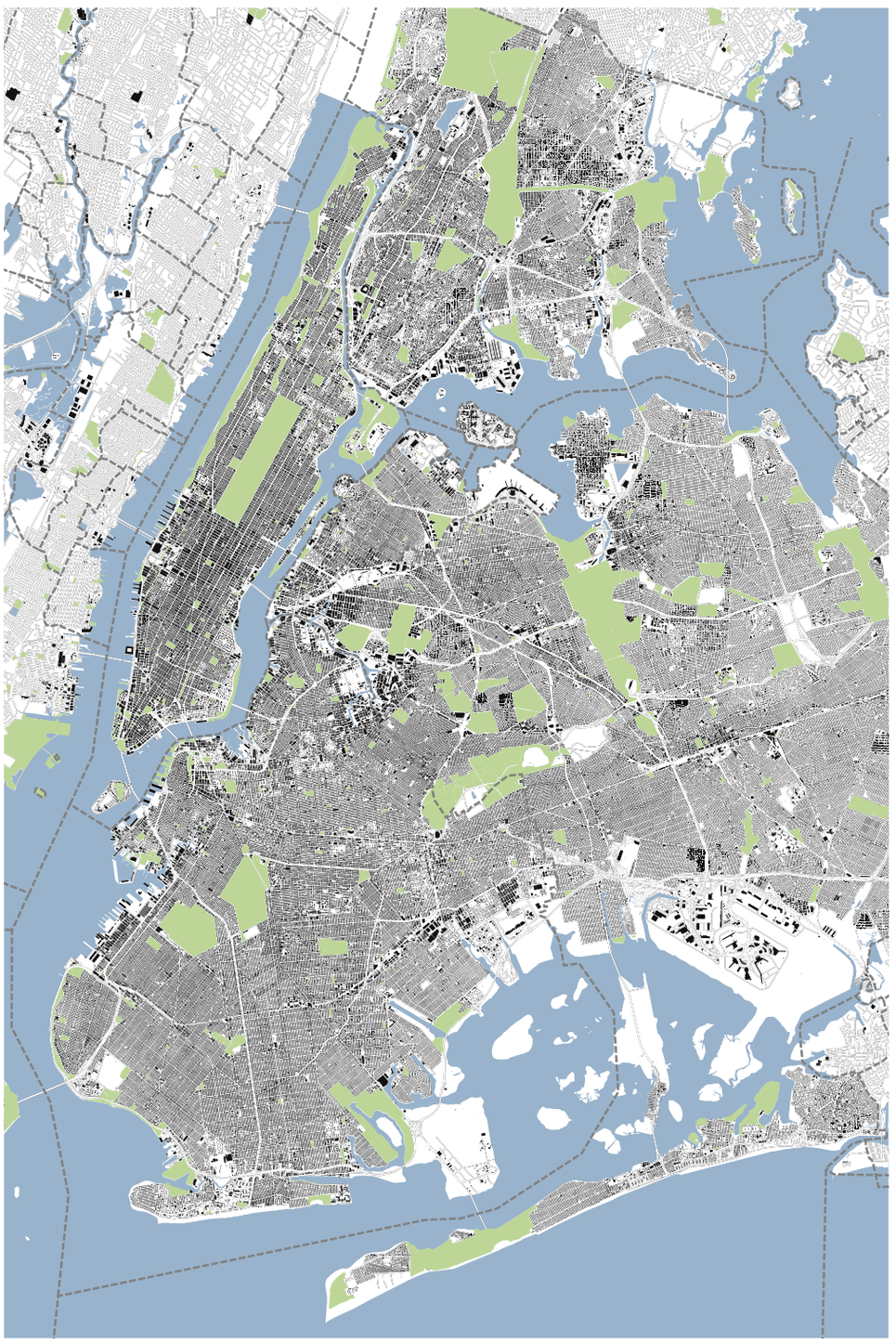



Illustration: Heatherwick Studio/ LUXIGON

Little Island

An intense love/fear relationship with water has shaped lives in and around New York City from the very beginning. The new Little Island Park at Manhattan's West Side is the latest addition to the long-term transformation of the waterfront from rough industrial harbor to upscale neighborhood park. 280 concrete piles support a 2,4 acre artificial island with a square shape tilted by 45 degrees off the shoreline. The piles open up to become concrete cones with undulating elevations that hold soil for a park and an amphitheater, accessible by two bridges from Hudson River Park. This 'park on a pedestal' is a significant design contribution to the landscape architecture discourse on park design in the age of resilience and the role of private donors in the public realm.

WOLFRAM HOEFER



The 1954 movie "On the Waterfront" with Marlon Brando tells the story of New York harbor longshoremen trying to make a living. The image of hard work, crime and corruption stuck with the Manhattan waterfront even after most harbor activities moved to Port Elizabeth, New Jersey, and the piers and warehouses were abandoned.

Signe Nielsen, landscape architect of the Little Island, is among the early pioneers of New York's green waterfront. She worked on the first 1993 master plan for the Hudson River Park and remembers early community meetings when it was very difficult for residents to imagine something else but crumbling piers, abandoned warehouses and derelict sheets of concrete. It was an alien thought for people participating in the public engagement process that the coastline of Manhattan could be an asset someday. Looking back, it is astonishing how quickly the public perception changed. Today's green waterfront seems to be a given. Nowadays, there are generations of people who do not remember how shabby it was everywhere on the Manhattan shore. An important step toward that change was the 1998 establishment of the Hudson River Park Trust through legislative action by New York City and the State of New York. The goal of the Hudson River Park Act was to develop and maintain public open spaces along Manhattan's West Side. While some capital funding was historically provided by the government, cost of operation and maintenance must be covered by income generated by rents from commercial tenants, fees from concessions, grants and private donations. From a European perspective, it is astonishing that the financial center of the world does not generate enough tax revenue to develop and maintain public parks for its residents. Instead, the extreme accumulation of private wealth in the new Gilded Age of

Illustration: SCHWARZPLAN.EU/OpenStreet-Mitwirkende/openstreetmap.org

Blue-green-grey infrastructure: New York's urban structure is defined by water. The geography is characterized by its coastal position, where the Hudson River and the Atlantic Ocean meet in a naturally sheltered harbor.

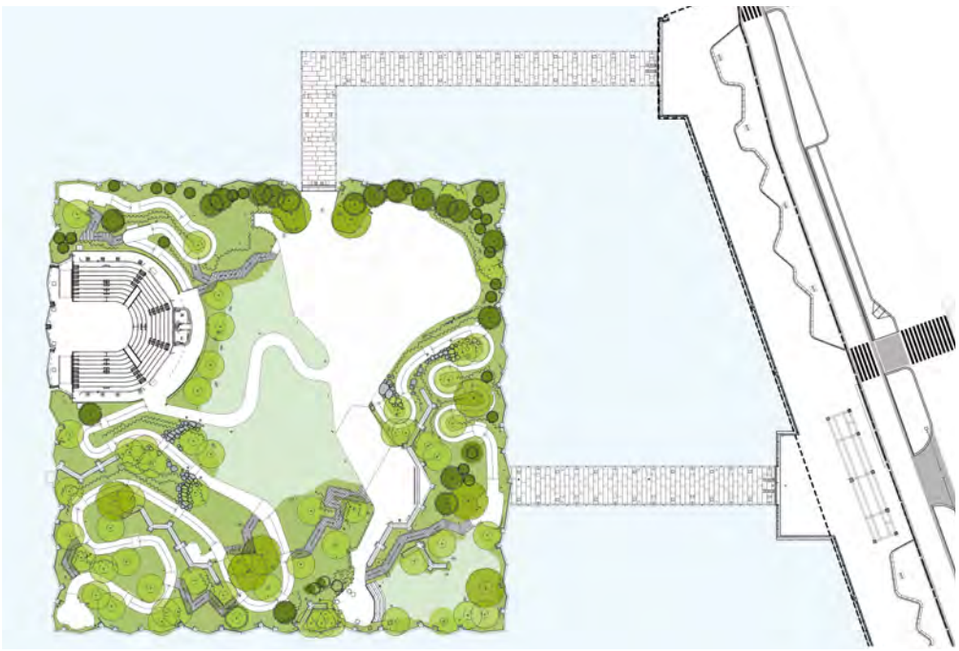
The planting plan makes use of the undulating topography. At some elevations it will feel like a pier, at others like a park. The western high point is crowned by woodland vegetation that opens up to a panorama overlooking the river.

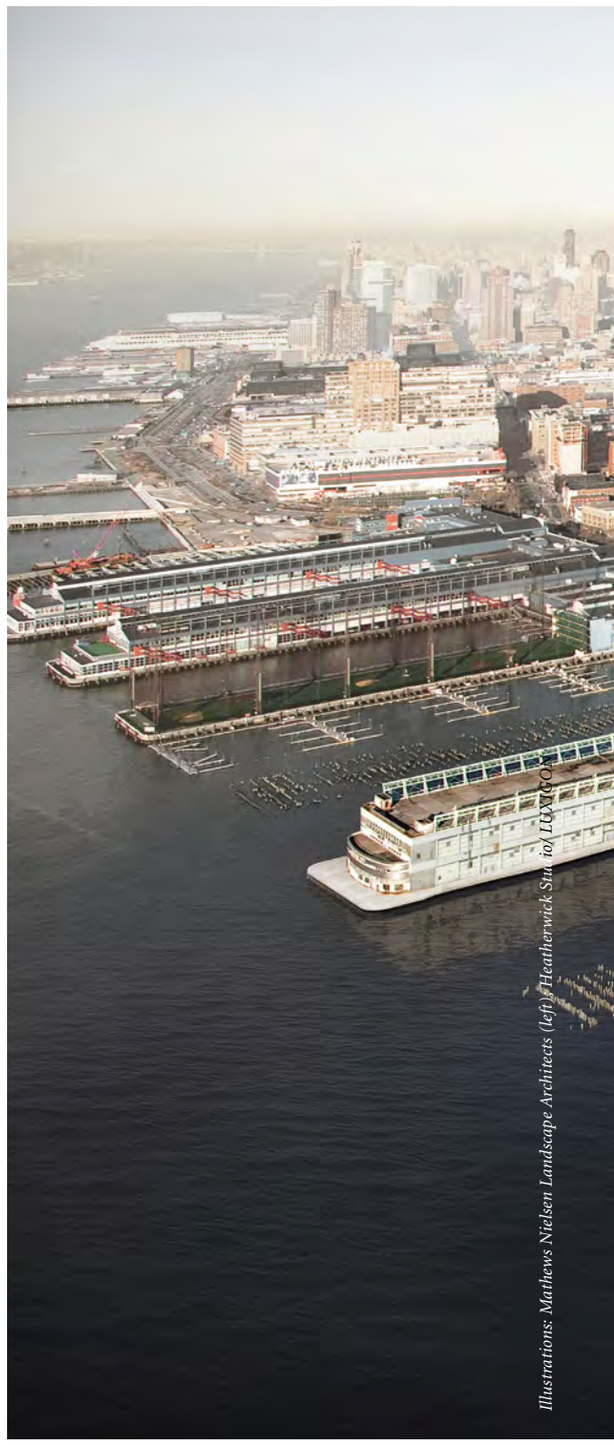
Illustration: Mathews Nielsen Landscape Architects

our time enables individuals to donate vast sums of money for public spaces, beyond the capacity of municipalities. Manhattan is the poster child of that development. The online archives of the New York Times reveal the winding story of the efforts to turn New York's former industrial waterfront into a park and the role of private donors in that process. The Diller-von Furstenberg Family Foundation was a leading donor for the High Line and was approached by Hudson River Park to help rebuild deteriorating Pier 54, a concert and exhibition venue of the park. Mr. Diller was willing to provide support after extensive negotiations but stipulated that the reconstruction be "something ambitious architecturally." The selected London-based firm Heatherwick Studio is known in New York for the "Vessel," a 46 metres outlook sculpture at Hudson Yards shopping mall. The team proposed to replace the old Piers 54 and 55 with a square-shaped island that places the lowest elevation of the new park at 5 metres above sea level, which is 3 metres higher than the existing bulkhead. Because of this significant elevation change it became necessary to place the new island further into the water to get the necessary length for gently rising ramps to reach the new elevation while maintaining full accessibility. The two new ramps of 48 and 55 metres length will provide the experience of walking a bridge across open water to reach the Little Island. It was necessary to lift the park up because this section of the waterfront will not be protected by the proposed sea wall "The Big U." Current estimates on sea level rise and expected storm surge allow the assumption that the park will not be impacted until at least the year 2080. When the next storm comes, the Meatpacking District will be flooded, but the island's plantings will survive because they are beyond the reach of saltwater. Another lesson learned from Hurricane Sandy in 2012 was not to use foam as light weight fill under plantings in the first 1.20 metres of the new elevation. At other piers along the Manhattan shoreline, the rising sea water reached the foam layer, forcing the foam to rise up rapidly so that the park plantings literally exploded.

280 concrete piles with a planter on top

An interdisciplinary team was formed to address the complex design and engineering challenges. Mueser Rutledge Consulting Engineers are the marine engineers that developed the engineering design for the placing and foundation of the piles in the water. Arup Engineers serve as structural engineers, making sure that the concrete objects are designed structurally robust and that the entire system will be resilient to wave action, earthquakes and the expected loads. Arup are also the designated mechanical, electrical and plumbing engineers. Fisher Marantz Stone are responsible for the lighting concept. An additional architecture firm, Standard Architects, was engaged to prepare the special public assembly permit required for the amphitheater. The office Mathews Nielsen Landscape Architects (MNLA) was selected because of Signe Nielsen's known expertise in planting design. Overtime the representatives of these well-established firms grew into an exceptionally collaborative team, says Signe Nielsen. In the early phase, MNLA's role had a sole focus on planting design. It took about six to eight months before the architects fully realized that landscape architecture has more to offer. MNLA provided research on materials and further established themselves as a creative partner, for example by contributing to the discussion on circulation. Heatherwick's original circulation design was just one pathway, similar to the circulation of





Illustrations: Mathews Nielsen Landscape Architects (left) / Heatherwick Studio/ LUXIGON

the Vessel or the High Line pilgrimage. Instead, MNLA suggested a "chutes and ladders" system. In addition to a primary accessible path, multiple secondary paths with steeper grades, steps, or climbing rocks will allow for different experiences and will divert the visitors. The landscape architects' space-making competence also manifested itself in how they developed the proportions of paths and paved spaces. Thinking through the hardscape, railings and other materials became a truly collaborative process. By contrast, the selection of plant material, soil mix and irrigation system is the sole responsibility of the landscape architect. The landscape architect's vision is a leaf floating on the water. The park user arrives from the busy and by now thoroughly gentrified Meatpacking District, takes a brief walk on the bridge, crosses from land to water. The transition from the big Manhattan Island to the Little Island stimulates a change of mindset. The planting plan makes use of the undulating topography. At some elevations it will feel like a pier, at others like a park. The western high point is crowned by woodland vegetation that opens up to a panorama overlooking the river. Evergreens protect from wind along the northern edge. The selection of 30 tree species, 55 shrub species, 160 perennials, 32 grass species, 60 bulbs and 12 vines is inspired by the idea of a planting design that follows diurnal as well as seasonal rhythms, providing flower and fruit attractions through all seasons and enhancing favorite places for different times of the day. An east-facing lawn is a great place for yoga in the morning; another lawn is for the sun lover, facing south and southwest. At lower elevations visitors are engulfed in the park, on higher levels they will see the skyline of Manhattan.

The selection of plant species happened in consultation with the horticulturalist of Hudson River Park Trust, building on existing

Little Island will be a green space featuring open lawns and gentle pathways, community spaces and performance venues due to open in Spring 2021. The goal is that all areas will always be free of charge to enter.

Heatherwick Studio explored the idea of designing a new pier that could draw from the remaining wooden piles from Pier 54. MNLA's landscape design was conceived as a leaf floating on water.

Ongoing construction work at Little Island. The project brings together a collaboration of local construction teams, engineers, and builders helping to make the park vision a reality.

knowledge on plant survival rates at other sections of the waterfront. Overall, the planting design is guided by the notion of resilience and inspired by vegetation found in the Acadia National Park in Maine. The islands in the Gulf of Maine form a coastal landscape where plants must survive the harsh conditions of shallow soil, high winds and saltwater spray. The undulating topography with rock outcrops creates viewpoints and vistas. The sophisticated planting design was only possible because the Diller-von Furstenberg Family Foundation has agreed to provide funding for 20 years of maintenance. The perennial plantings may change after 20 years and evolve into meadows provided the maintenance funding should dry up. Signe Nielsen points out that the planting design allows for evolution. The secured funding will further make it possible to abstain from fees and program charges, an advantage compared to sections of Hudson River Park and other parks in the city where rents from commercial tenants and concession fees are needed to pay for maintenance. Although the Diller-von Furstenberg Foundation has leased the site from Hudson River Park Trust for twenty years, the lease prohibits any closure for private fundraising events. The goal is that all portions of Little Island will always be free of charge to enter. After all, it is a neighborhood park to be enjoyed by residents.

A neighborhood park

The Little Island Park will be a highlight of Hudson River Park, which has already become a model for the East Side and other New York City waterfront park developments. At community meetings about those new projects, residents name Hudson River Park as a positive example for what they are looking for. However, newer parks along the East Side or in Brooklyn, like the Brooklyn Bridge Park by Michael Van Valkenburgh Associates, allow a direct interaction between park users and the water. They make the tidal change visible, a rare experience in this coastal city. At the Hudson River Park, instead, the shoreline is still formed by harbor bulkheads. Signe Nielsen shared the insight that it took the permit-granting city authorities some time to acknowledge that even urban shorelines can be changed to improve marine life and water quality. And there is still more work to be done. The piers 40, 76 and 97 still need to be renovated and/or converted, and other piers may come into play as well. What will happen to the cruise terminals on piers 92/94 in case the cruise ship industry does not recover from the current coronavirus crisis?

The coronavirus crisis is already a challenge for landscape architecture firms in the New York region. While current projects are continued, the public sector has become hesitant to invest in new parks. Philanthropy also takes a hit when private profits decline. On the other hand, Corona clearly shows the importance of public parks for maintaining public health – both the physical and mental well-being of city residents. Lush funding by its wealthy donors allows Little Island Park to successfully showcase the impressive range of design opportunities that open up when money plays no role. Cutting-edge engineering will create an exciting artificial landscape with a sophisticated planting design that is likely to produce stunning on-site experiences for visitors. This park on a pedestal, however, is like the one elevated house in a coastal community where all other neighbors cannot afford to build on stilts. This also makes it a monument for the expected storm surge, indicating that this leaf will still be floating when the surrounding neighborhoods have already drowned.

CALMA – NOW DESIGN IN CIRCLES AND ORGANIC LINES AS WELL

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Awakening a Lifeline

Huangpu River stretches 113 kilometres across the urban realm of Shanghai and separates the city into two parts. Urban life is and has always been connected with the river and its banks. However, the riverfront has been generally used for trade, commerce and industry, and was thus inaccessible to many. So, what happened to the banks after the redevelopment of the historical promenade The Bund, and after the World Expo 2010 – two correlated projects that aimed at opening up Shanghai's waterfront to the public? In one of the fastest-growing cities in the world the only answer is: a great deal.

HUBERTUS ADAM

Illustration: Concepto for Agence [illegible]

In 2016 Agence Ter won the master plan, which was based on binding basic principles to ensure the riverbank parks were designed in a uniform manner, yet allowed for each section to have its own character.

How to manage industrial sites? The contribution by Atelier Deshaus comprises the conversion of the Laobaidu coal bunker into an exhibition space for the Modern Art Museum Shanghai.

The design by West 8 aimed at turning the east coast into an integrated waterfront corridor with city squares and public green space, complete with cycling tracks connected to the city centre.

The Huangpu River has always been the lifeline of the Chinese metropolis Shanghai with its almost 30 million inhabitants. The river is 113 kilometres long and grows to a width of almost 800 metres before it flows into the Yangtze. In the city, the river's large loops separate the seven western inner-city districts (Puxi) from the Pudong District, which occupies the entire eastern bank of the river. The high bridges of the various motorway rings dominate the city and various road and metro tunnels connect both banks, while those on foot can use the more leisurely ferries. Since the foundation of the city, the banks of the river, as is often the case elsewhere, have been generally used for trade, commerce and industry, and were thus inaccessible to those who did not work there. The legendary Bund, i.e. the riverside promenade in front of the British colonial quarter's representative buildings, was the only exception to this. After the establishment of the Pudong Special Economic Zone in 1990, the Central Business District (CBD) was created in the Lujiazui District on the opposite bank, with its illuminated night-time skyscrapers that characterise the iconic image of today's Shanghai.

The opening of China to the West was also associated with a radical change in the country's own economy. China experienced a tertiarisation of its industry, and previous production plants quickly became wastelands. This post-industrial structural change has been particularly visible on the banks of the Huangpu River in Shanghai. Expo 2010, which took place across extensive areas on both sides of the river south of the city centre, was the clearest expression of the fact that redesigning the banks of the Huangpu was a new challenge. The question became all the more pressing as the World Expo closed its doors. What to do with the former Expo areas? And what to do with the areas along the riverbanks throughout the city that were previously used for industry? Thus, improved flood protection and the management of brownfield sites became current issues, and the objective was to ultimately redesign and reprogramme the zones adjacent to the river. An important figure in this context was Sun Jiwei, a politician who was trained as an architect at Tongji University, and who had previously promoted contemporary architecture in the satellite cities of Qingpu and Jiading. He promoted the idea of transforming the unused area around the first commercial airport south of the city centre (Longhua Airport, which opened in 1917) into an art district.

This resulted in the West Bund Cultural Corridor, which consists of museums, galleries and exhibition halls. One of Sun's coups was to persuade collectors from the Long Museum in Pudong to build a branch at the West Bund and to then put them in contact with Atelier Deshaus, which was founded in 2001 as one of the first private architectural firms in China. The architects used an existing underground car park that belonged to a failed construction project as a foundation, and built the museum building on top of it, integrating a number of historic coal bunkers in the process.

In 2015, one year after the opening of the Long Museum, the Shanghai Urban Space Art Season (SUSAS) took place for the first time, and is now held every two years. This biennial for art and public space wanders through the city and consists of a main exhibition site, a reference area and various satellite exhibitions. The theme for 2015 was the management of old industrial sites, which is evidence of the interest in industrial heritage that is gradually emerging after an era of tabula rasa. Atelier Deshaus' biggest contribution was a conversion of the threatened Laobaidu coal bunker on the eastern bank of the Huangpu into an exhibition space that has since been used by the newly founded Modern Art Museum Shanghai, and which was integrated into the new design of the river bank by YiYu Design in 2017. This was the same year Atelier Deshaus also devoted itself to the granaries of Minsheng Wharf a few kilometres downstream in Pudong, which had long dominated the riverbank. Through the use of a cascading glass staircase, the architects made the top floor accessible as an exhibition space for the SUSAS 2017 – although, after the end of the event, it was (and still is) unclear what will happen to the location. In the meanwhile the Pudong District took the initiative of launching a competition for the redevelopment of the eastern banks of the Huangpu River – 22 kilometres, stretching from the inner ring's Yang Pu Bridge in the north to the outer ring's Xu Pu Bridge in the south. In 2016 Agence Ter won the master plan, which was based on binding basic principles to ensure the riverbank parks were designed in a uniform manner, yet allowed for each section to have its own character. A common element, not only on the so-called East Bund but also on the western side of the river (a total of 45 kilometres of riverbank) is formed by a trio of footpaths, bicycle paths and jogging tracks. These sometimes run together, but split up when necessary according to the different speeds of movement – and have to cross the channels and tributaries flowing into the Huangpu again and again by means of bridges. Further aspects of Agence Ter's

Photos: Hubertus Adam


泰隆银行

On the way downriver from the historic Bund one passes the Yangshupu Waterworks. An additional 2.7 kilometres of riverfront east of the Yang Pu Bridge was opened in late September 2019.

The Green Building, a stepped concrete structure that was part of a former tobacco warehouse, has been planted and was one of the attractions of SUSAS 2019.

masterplan included the covering of the flood protection wall by a designed, partially terraced landscape, distinct vegetation zones – low towards the river to keep the view clear, higher towards the land on the other side – and finally the accentuation of the route by towers every kilometre that are illuminated at night. After winning the competition in 2016, the 22 kilometres were split up between a number of teams. Agence Ter's projects included the Park of the Cement Factory in the far south, the waterfront in front of the former Expo site and the waterfront at the Lujiazui CBD. Further downstream, West 8 took over – with ornamental paving and large amoeba-like planting troughs lined with benches. At Minsheng Yard, in front of the silos converted by Atelier Deshaus, the baton was passed to Atelier Liu Yuyang Architects (ALYA).

The paths here thread their way through the substructure of the loading bridges, and continue their way in the form of a circular crossing over a small side harbour. The redesign of the eastern riverbanks ends just beyond the bright red Yang Pu Bridge in a park created by the Design Land Cooperative (DLC). Walking along the riverside parks, pavilion-like buildings that have not yet found a use are a common sight. According to local regulations, five per cent of the riverbank may be built on, while another regulation prevents their being used commercially. So here, as elsewhere in Shanghai, you search in vain for riverside cafés; the only things available are from vending machines at the entrances of the parks or in some small buildings.

Kuo Yi-Fong, a partner at ALYA, is waiting for us at Minsheng Wharf. She talks about the difficulties in planning, i.e. parts of the land belong to the city, others to the district, and the area directly along the river is also under the jurisdiction of the state. And time pressure was enormous: A mere two years passed between the start of planning in 2016 and the completion of the East Bund's 22-kilometre-long riverbank zone. But in China, says Kuo laconically, you always have just one opportunity. All in all, the situation for independent architecture firms in China is much more difficult at present than it was a few years ago, according to Atelier Deshaus, and they have therefore joined forces in a collaborative called AnAlliance with ALYA, Atelier Z+ and other planners in order to increase their clout. AnAlliance was then involved in the redevelopment of the opposing riverbank to the west in Yangpu County, the reference area for SUSAS 2019, where the industrialisation of the city began in the colonial era: Shipyards, factories and power plants once lined the riverbank. The main exhibition site in 2019 was an old warehouse in the middle of the area where Shanghai's industrial development began. On the way downriver from the historic Bund via the Hongkou district, one passes the former dry docks of the Shanghai Shipyards and the Yangshupu Waterworks, a picturesque ensemble of buildings with towers, battlements and orientalised lancet windows built in 1883 by the British architect J. W. Hart. An additional 2.7 kilometres of riverfront east of the Yang Pu Bridge was opened together with SUSAS in late September 2019. New parks have been created here, and historic port facilities and factories embellished, sometimes with an excess of creative ambition. A certain degree of "over-design" is typical of Chinese landscape architecture, and while investing in landscape architecture here is certainly a good thing, as is concern for human and financial resources – this concern has a completely different status in Asia, and design sometimes appears to be overly orchestrated. Kuo Yi-Fong points to a park with simple grasses designed by ALYA – it took an enormous effort to implement this simple planting, because it is not generally perceived as being beautiful here. Under the leadership of Zhang Ming, the deputy head of the Department of Architecture at Tongji University, a number of landscape designers and architects were involved in the latest SUSAS projects. Although the hinterland remains tabula rasa, Shanghai is still reflecting on its industrial heritage. The Green Building, a stepped concrete structure that was part of a former tobacco warehouse, has been planted and was one of the attractions of SUSAS 2019, and port cranes, industrial halls, and the pipelines of a former soap factory now converted into a café are also passed on the way downstream. Not too far from here is the Riverside Passage, the ninth project of Atelier Deshaus on the banks of the Huangpu River. It is based on a long concrete wall, the relic of a former coal storage facility. The newly installed viewing gallery is covered by a steel mono-pitch roof that rests on the top of the wall by means of filigree supports, sloping down towards the back to provide protection for a second passage located directly on the platform at the rear. Two different spaces with two different views – one of the spontaneous vegetation behind the wall and one of the river in front of it – have been created. The local authorities actually wanted to tear down this relic, but on the initiative of Atelier Deshaus it was preserved, and in the end it was unofficially included in SUSA's programme. It is probably the most poetic, subtle and least intrusive project along this section of the riverbank.

Photos: Hubertus Adam

A rainwater cascade system in the suburban neighborhood Deurne/ Borgerhout: An exemplary case in which spatial design and hydrological modelling has been interactively executed.

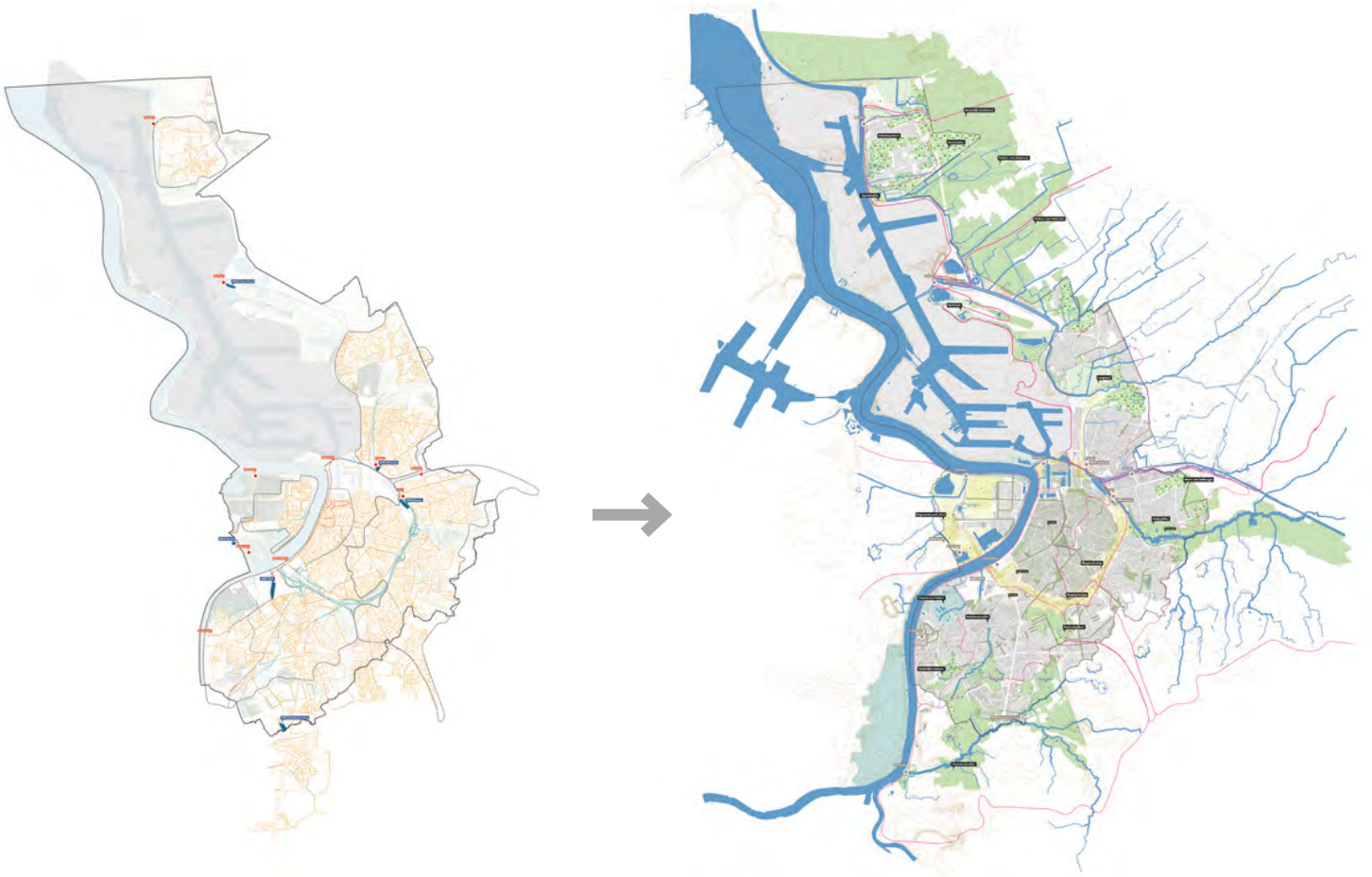
Illustration: De Urbanisten

Water as a

Due to climate change urban regions all over the world are facing serious social, ecological and economic challenges. The way in which most of our cities are designed, however, does not make them resistant to weather extremes. Thus, the Waterplan of Antwerp gives an inspiring vision of how the city needs to approach future projects to get ready for a changing climate. This also produces an attractive living environment that is made for all inhabitants of Antwerp while offering flexibility for adaptation to a changing future.

FLORIAN BOER AND TIMO STEVENS

Leverage to redesign



ARTIFICIAL WATER CITY

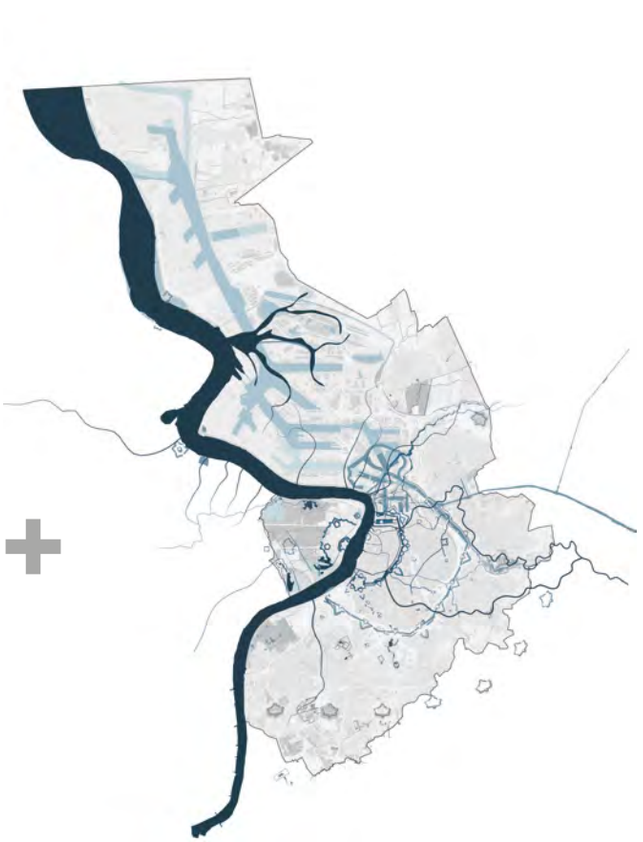
NATURAL WATER CITY

The social, environmental and economic challenges as a result of climate change are enormous, especially in cities. Periods of extreme rainfall will increase both in frequency and intensity. At the same time the number of days with extreme heat will increase, resulting in longer periods of drought and a reduction of groundwater levels. To provide an answer to these challenges, the city of Antwerp has developed a new urban Waterplan that aims for a city-wide vision and seeks integrated short- and long-term solutions for its water challenges. Instead of solely focusing on the problems caused by climate change, the Waterplan equally focuses on the spatial potential and qualities that blue and green structures can provide for its urban fabric. The Waterplan shows that there is a need for an interactive relationship between spatial design and hydrological modelling, for stimulating co-operation between different stakeholders as well as facilitating its implementation. In addition to climatological and spatial challenges and opportunities, the Waterplan tells the story of a historic water city and provides a narrative for Antwerp as a future water-sensitive city in order to increase water awareness.

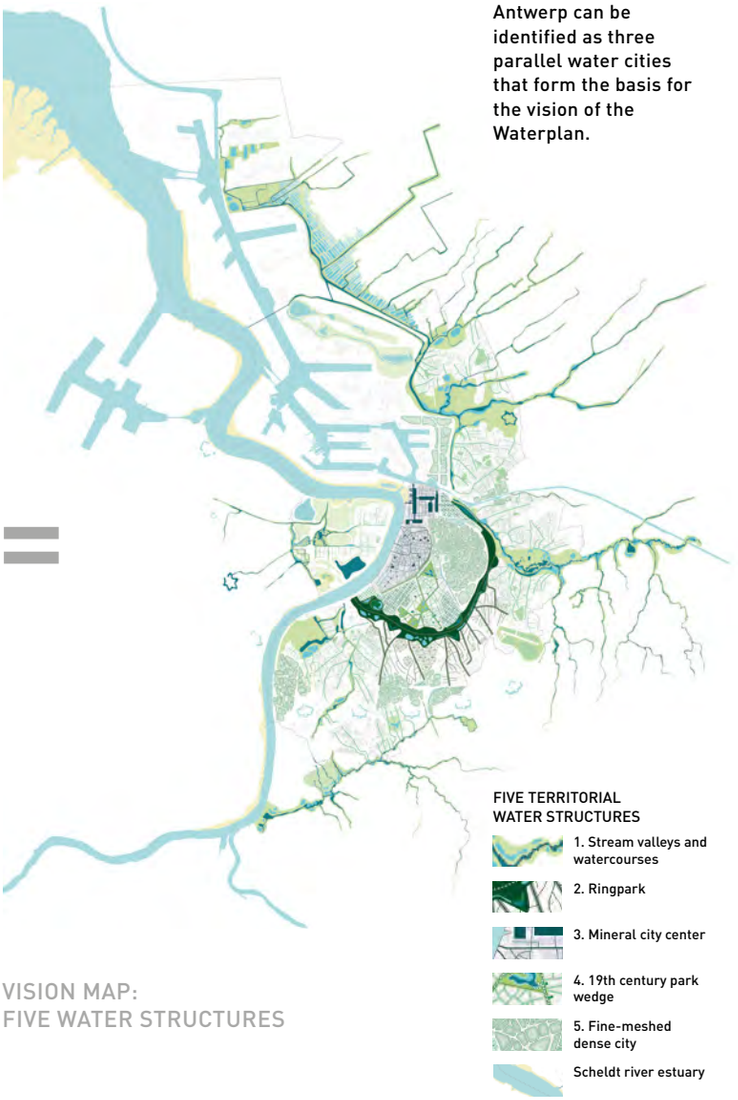
Three water cities

An analysis of the historical and current water system shows the evolving and sometimes tense dialogue between water and the city over the past centuries. Furthermore, an analysis of the existing urban structures in combination with climatological projections for current and future flooding (2050 and 2100) identifies possibilities to find room for water-related challenges on a pragmatic scale. Merging the spatial and hydrological analyses teaches us that Antwerp can be identified not as only one but three parallel water cities that form the basis for the Waterplan. The first one consists of the technical water system on which the city functions nowadays and is named the Artificial Water City. It shows sewer infrastructures, pumping stations and water treatment plants. These technical facilities were installed over past centuries, and were considered necessary for the city to grow and evolve. Nowadays, this is the most dominant water city. This system is becoming more and more dysfunctional, however, and climatological predictions supported by hydrological calculations show that the

Illustration: De Urbanisten



HIDDEN WATER CITY



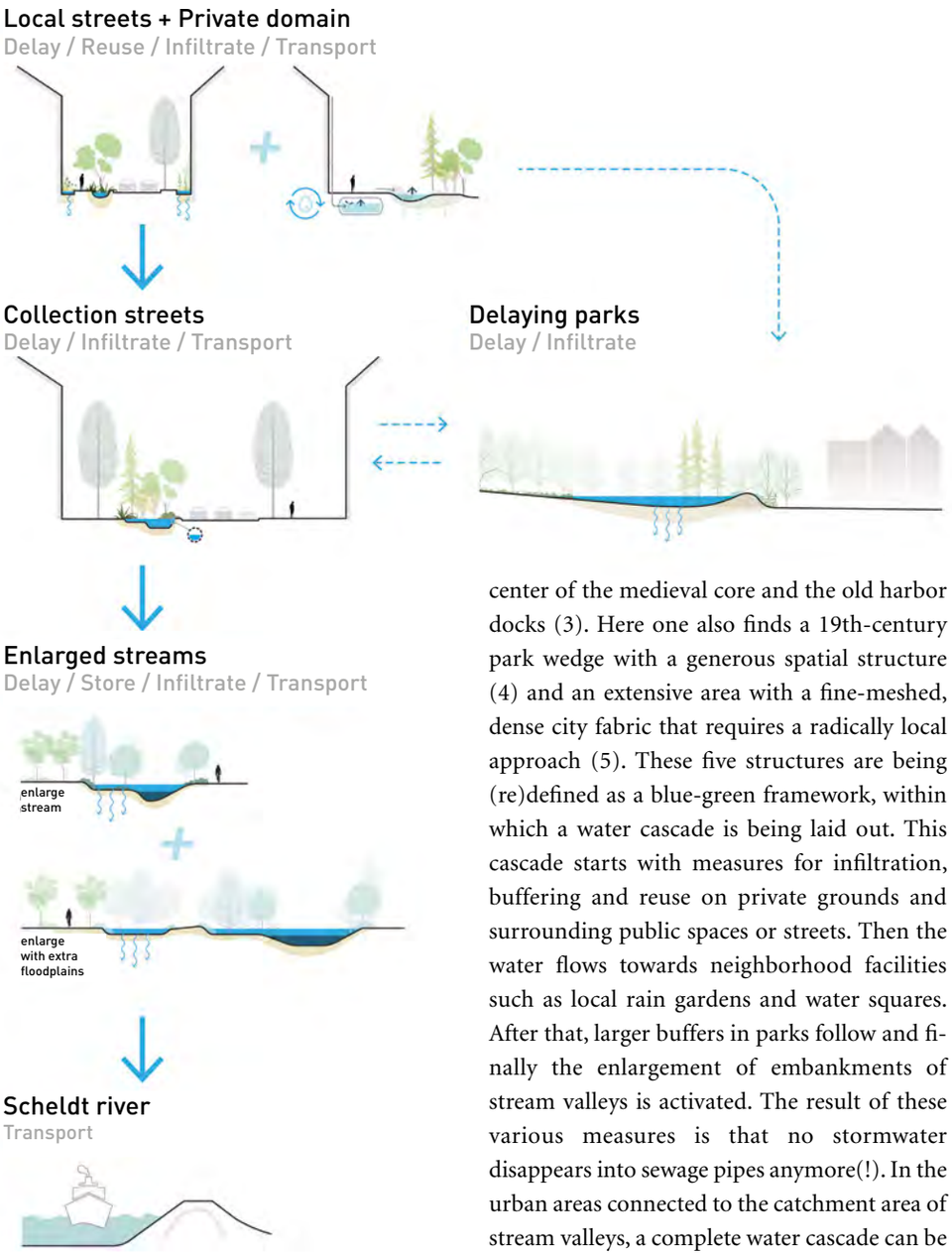
VISION MAP:
FIVE WATER STRUCTURES

Illustration: De Urbanisten

future challenges cannot be resolved within these existing infrastructures. This city will have to learn to coexist more and more with other types of systems. Secondly, the natural origins on which the city was built still exist andhave been neglected for much too long. This we named the Natural Water City and it includes original topographies, green-blue networks, varying soil compositions and existing stream valleys. They form the underlying natural potential of the city. In various specific locations in Antwerp, these elements are still tangible and provide significant spatial and climate-adaptive qualities for their adjacent urban fabric. Interestingly enough, these structures are now hardly ever used for water management purposes. The goal of the Waterplan is to reactivate, strengthen and expand these structures. The third city is defined as the Hidden Water City and refers to the historical water (infra)structures that played an important role in the founding and first urban developments of Antwerp. They tell the story of (re)moved rivers, medieval sewage systems, military hydrological infrastructures, canals, ponds and the often hidden remnants of this water-related history. The Waterplan aims to reactivate and unveil the structures that are still there and simultaneously retell the story of this rich heritage while adding new layers to it. The dominance of man-made elements and structures implies that there is currently no sustainable equilibrium between the three water cities that create Antwerp. The Waterplan aims to reinstall this balance with one city-wide vision.

One vision – five water structures

The Waterplan comprises a city-wide vision, aiming at a better balance between the three water cities. It builds upon the resilience of the Natural Water City, seeks possibilities in the remnants of the Hidden Water City and uses the Artificial Water City as a backup. The vision consists of five territorial water structures based on the spatial characteristics that can be found in the city. This concerns the stream valleys and watercourses that run from higher plateaus to the Scheldt river and have been bent over time along the edges of the city center (1). This edge is strongly determined by the ring road that borders the city center like a park zone, which can be activated for water management (2). On the inside we find the mineral



The main principle of a water cascade: For each of the five water structures a rainwater-cascade has been developed.

center of the medieval core and the old harbor docks (3). Here one also finds a 19th-century park wedge with a generous spatial structure (4) and an extensive area with a fine-meshed, dense city fabric that requires a radically local approach (5). These five structures are being (re)defined as a blue-green framework, within which a water cascade is being laid out. This cascade starts with measures for infiltration, buffering and reuse on private grounds and surrounding public spaces or streets. Then the water flows towards neighborhood facilities such as local rain gardens and water squares. After that, larger buffers in parks follow and finally the enlargement of embankments of stream valleys is activated. The result of these various measures is that no stormwater disappears into sewage pipes anymore(!). In the urban areas connected to the catchment area of stream valleys, a complete water cascade can be installed. In radically local areas, the space for water must be found within a short cascade mainly consisting of local measures. To complete the stormwater cascade, a toolbox consisting of 60 water-sensitive measures has been developed. The toolbox consists of particular options for spatial intervention in both private and public areas. They vary in appearance, use of space, groundwater level tolerance and additional values such as an increase in biodiversity and the mitigation of urban heat island effects. Depending on the specific location in the city and the corresponding territorial water structure, certain interventions are more suitable for implementation than others.

Interactive case studies

To test the conceptual vision of the Waterplan, several exemplary cases have been elaborated in which spatial design and hydrological modeling have been interactively executed. One specific case aims to run through a complete water cascade from private grounds to the stream valley, while optimally utilizing the existing topography for gravitational water transport between its beginning and the end point. This case has been hydrologically modeled and its proposed dimensions of water-sensitive measures are geared to accommodate future peak rain events (a so-called T20 rain event in 2050). The results have been conceived in co-creative working sessions with stakeholders. In this example, the first examination aims at determining which housing blocks can potentially fully absorb and retain their own water load. These are the blocks with large private gardens or a central collective facility. Next is a determination of how much water can flow to public collection points in the district, such as rain gardens, water squares and one large park buffer. This was compared to the actual amount of water that can be spatially retained here. The remaining water load is accommodated through a mix of water buffering streets (local solution) and floodable green areas/wadis adjacent to the stream bed (district level solution). The actual implementation of such a water cascade should be conducted with the right phasing. One should start downstream and then go upstream step-by-step, while gradually branching more streets into the catchment area. It is best to initially focus on one clear backbone per water cascade, also for purposes of clear communication towards the citizens.

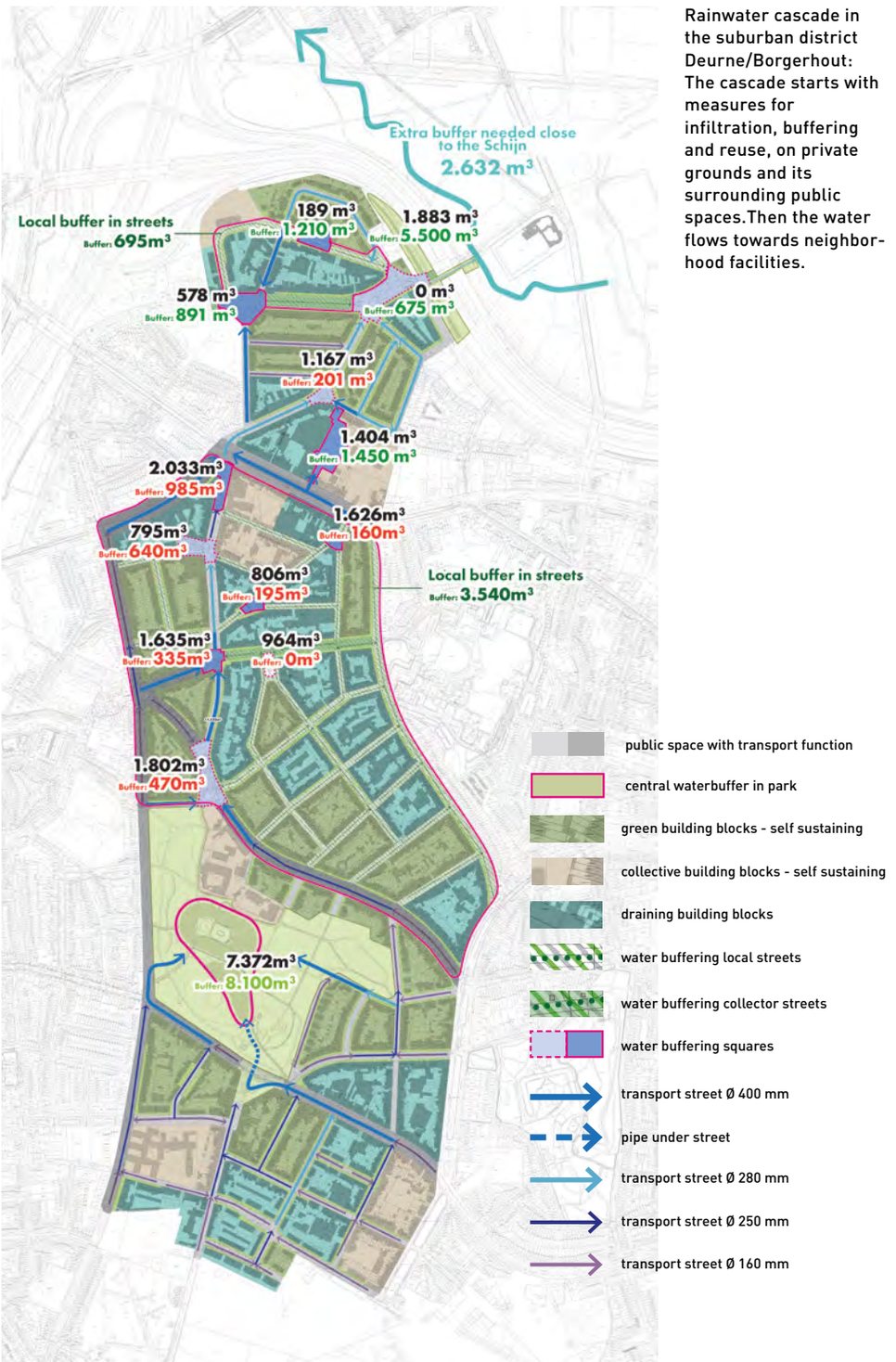
Implementation

Several design workshops have been organized across institutional silos to provide better insight and to tackle the complexities regarding the im-

Illustration: De Urbanisten

plementation of the Waterplan. This implementation strategy is translated into specific projects within the multi-annual city budget for the governance period 2020 – 2025. Exemplary projects will be the redevelopment of the central city park and its historic pond as stormwater buffer; the development of water-sensitive garden streets and the elaboration of district waterplans to further detail the Waterplan into the urban fabric of the city. The strength of the Waterplan is its completeness in content and trajectory. It ranges from spatial and hydrological analysis to a city-wide vision, with strategies for all subareas, including pragmatic tools for implementation. The testing of the concept in various exemplary locations helps to arrive at a common denominator, while calculating and designing are done interactively. The feedback from the case studies has helped to further the overall strategy and to define an implementation plan with concrete project proposals. The vision document and its follow-up actions have been politically ratified, budgets have been allocated and follow-up actions have been defined. Following a two year long interactive creation process, the Waterplan is embedded into a broad range of city departments, the utility companies and the regional governmental institutions. The Waterplan narrates a hydrological and spatial blueprint for the city and also frames the transition from existing design strategies to implementation processes for the coming decades. Water is used as a leverage to redesign Antwerp, focusing on the challenges of flooding and integrating various climate adaptation strategies while substantially greening the city.

The Antwerp Waterplan has been conceived by a consortium of: De Urbanisten, an office for urban research, design and landscape (Rotterdam, NL), Witteveen+Bos Consulting Engineers (Antwerp, B), the communication agency Common Ground (Antwerp, B). The client is the City of Antwerp and its water partners, the utility companies Aquafin and Water-link and the Province of Antwerp and the Flemish Environmental Institute (VMM).



Rainwater cascade in the suburban district Deurne/Borgerhout: The cascade starts with measures for infiltration, buffering and reuse, on private grounds and its surrounding public spaces.Then the water flows towards neighborhood facilities.

Illustration: De Urbanisten

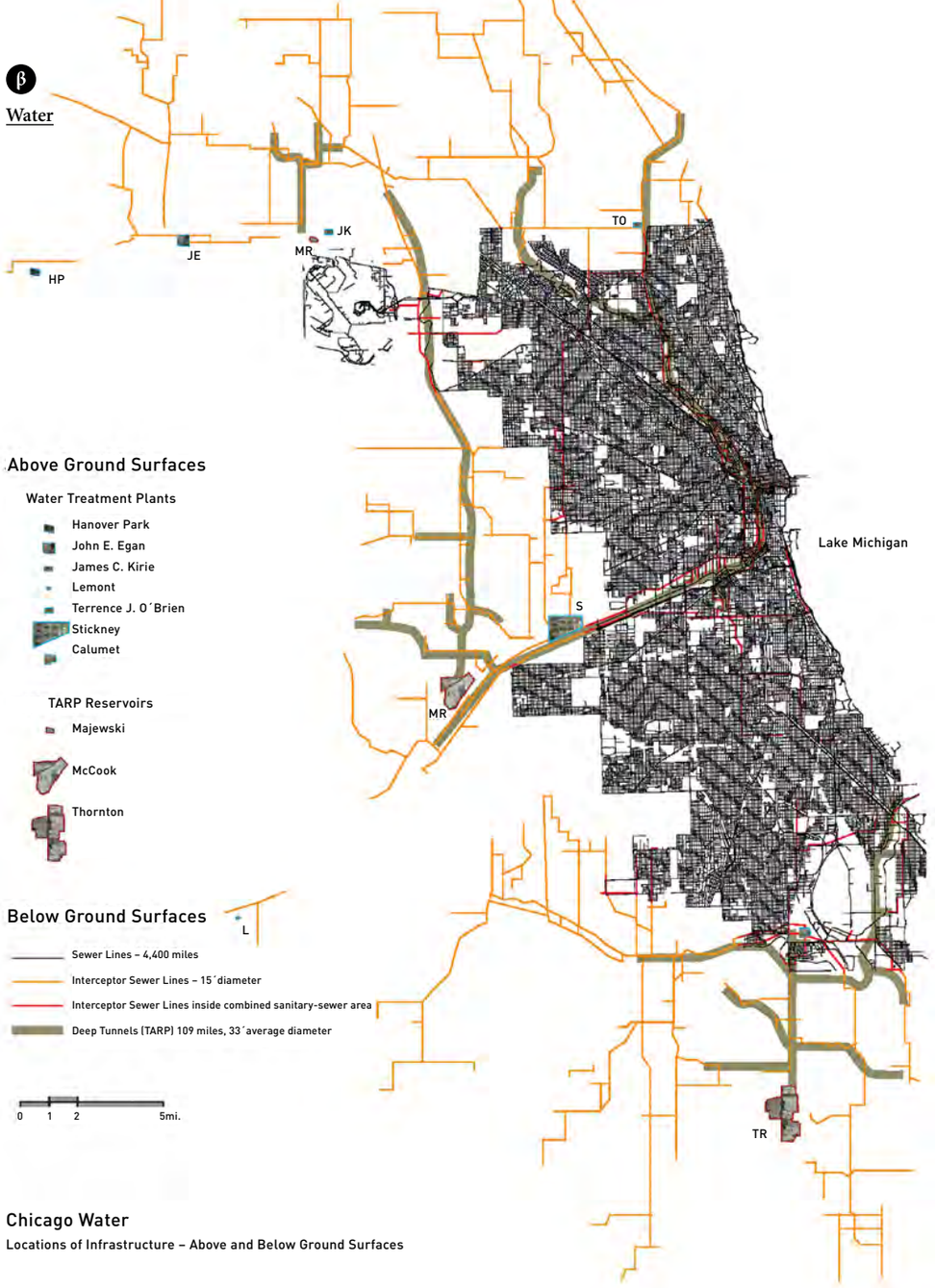
Looking south along the Chicago River; Lake Michigan is to the east.

Photo: Alamy Stock Foto / Zoonar/Alberto Rosati

Retrofitting urban Landscapes

Chicago has a paradoxical relationship with water. The city's landscape history has been determined by water: the terrain was shaped by glaciation, lakeshore retreat, and coastal processes; and the city bridges two major navigable North American waterways. Yet Chicago's spatial formation and infrastructure systems resist those hhydro-geographical histories and their advantages. In the 21st century we must update the modern city and radically retrofit land previously dedicated to industry and roadway infrastructure.

MARY PAT MCGUIRE



Chicago Water
Locations of Infrastructure – Above and Below Ground Surfaces

City of Chicago - Gray Infrastructure System. (O'Rourke & McGuire).

Cities need to dramatically redefine and restructure their relationships with water, particularly in regions where climate change challenges their reliance on engineered hydrologies. The early settlement patterns of cities often took advantage of natural hydrogeographical positions – river and lake fronts, natural harbors, and so on – either for security, navigation, or commerce. However, these strategic land–water interfaces were often aggressively manipulated, dividing water and land, forcing them into submission, and compromising ecological, social, and functional relationships with the very waters they depended upon. Now, cities need to unpack these histories, reimagine themselves and redesign with water through more nuanced and interdependent nature–city relationships.[1]

Chicago is one such city, situated on the southwest shore of Lake Michigan, at the shortest distance between two major North American navigation routes, the Mississippi River watershed and the Great Lakes–St. Lawrence Seaway.[2] Chicago managed to inhabit this low-lying, seasonally wet geographical location by manipulating both regional and continental hydrology.[3] To protect its water source, Lake Michigan, the City diverted its stormwater and wastewater through the reversal of two rivers, the Chicago and the Calumet. By the 1920s, Chicago was hydraulically engineered out of its natural watershed of the Great Lakes Basin to that of the Mississippi River.[4] Today, Chicago withdraws roughly two billion gallons of fresh water from Lake Michigan each day and exports the flow of rainwater and wastewater westward outside the city through a combined sewer system, drained by vast imperviousness and a network of sewers and tunnels.

Although Chicago stands among US cities to recognize green infrastructure (GI) adaptation as fundamental to 21st-century urban water resilience, it has constructed comparatively little GI. Chicago's ongoing gray infrastructure implementation reflects a long-term political and economic pattern driven by fragmented agencies and continued cost-accounting reliant on environmental externalization. In their book Cities and Their Vital Infrastructure, Robert Herman and Jesse Ausubel write that "our infrastructure both records our past and shapes the present and future, except that early events or fluctuations act to push us into particular states or structures that the system eventually 'locks into'. With regard to infrastructure, we become locked into both particular spatial configurations and also technological choices."[5] From this, they make two important points: first, that a history of singular infrastructure decisions can create future boundary conditions against the potential for more comprehensive outcomes, and second, while patterns of urban development may be generalizable, each city has unique circumstances that must be addressed in designing its alternative futures.

Chicago is no exception. As a city "locked into" a gray infrastructure system incapable of meeting the challenges posed by climate change, Chicago's functional and aesthetic water relationships will need to be re-dressed through spatial, material, and technical considerations based on existing conditions, culture, and politics. What follows are three landscape-based infrastructure strategies proposed to transform the existing urban (bounded) system beyond its current limitations.

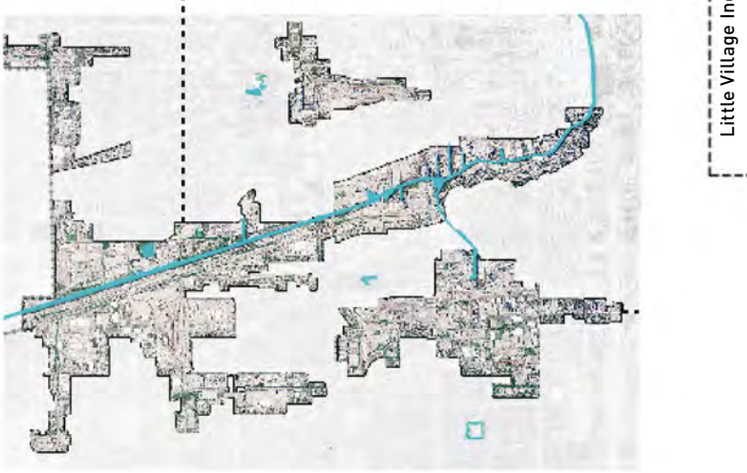
Illustration: O'Rourke & McGuire

Designing water into the urban surface

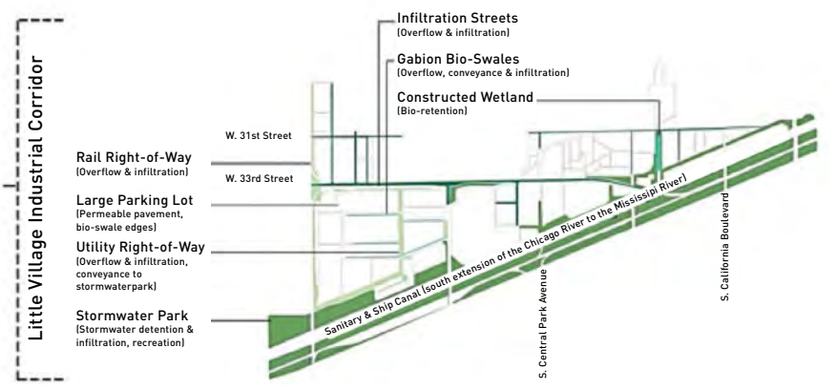
Streets. Along with the engineering developments that facilitated Chicago's urbanization, all modern water infrastructure was located in the street grid to collect and convey storm and sanitary water away from blocks and neighborhoods. Because much of the surface of the city is designed to drain the streets, the opportunity to collect stormwater in the right-of-way is astronomical in volume. Geographically extensive and distributed, Chicago streets now comprise 23 per cent of the land surface of Chicago. For a 1-inch rain event, one billion gallons of water falls on public streets alone. The Sustainable Urban Infrastructure Guidelines created by the Chicago Department of Transportation[6] acknowledged the stormwater redesign opportunities of Chicago's streets, but follow-through is still needed. Variable conditions of underlying soils and sociocultural neighborhood contexts might allow productive street retrofits to take shape. For example, designing for infiltration in the South Side of Chicago should be a priority where population has diminished, flooding is most severe, roadways are underutilized, and equitable design for underserved communities is badly needed.

An ideal water-street retrofit opportunity is the 2.25-mile-long Stony Island Avenue, extending from historic Jackson Park[7] in the north to Calumet Lake in the south. This declining commercial avenue in a historically Black area of the city was originally part of the Burnham & Bennett Boulevard Plan.[8] Today it could become a great water boulevard and hold tens of millions of gallons in a single rain event through a series of linear water gardens that would convert underutilized pavements and abandoned, vacant lots along its length. As Chicago targets flood-prone urban areas, streets are natural and obvious candidates for conversion to green infrastructure as they are the primary tributaries to the gray system. They also offer an under-explored hybrid park typology for areas of the city with some of the lowest park percentages per capita.

Industrial Landscapes. A second potential surface retrofit opportunity exists in the 24 industrial corridors, comprising 16,000 acres of land, primarily located in the West and South Sides of Chicago and the Calumet industrial area, many of which border rivers and canals. The surfaces of these industrial corridors are nearly completely paved in asphalt and con-

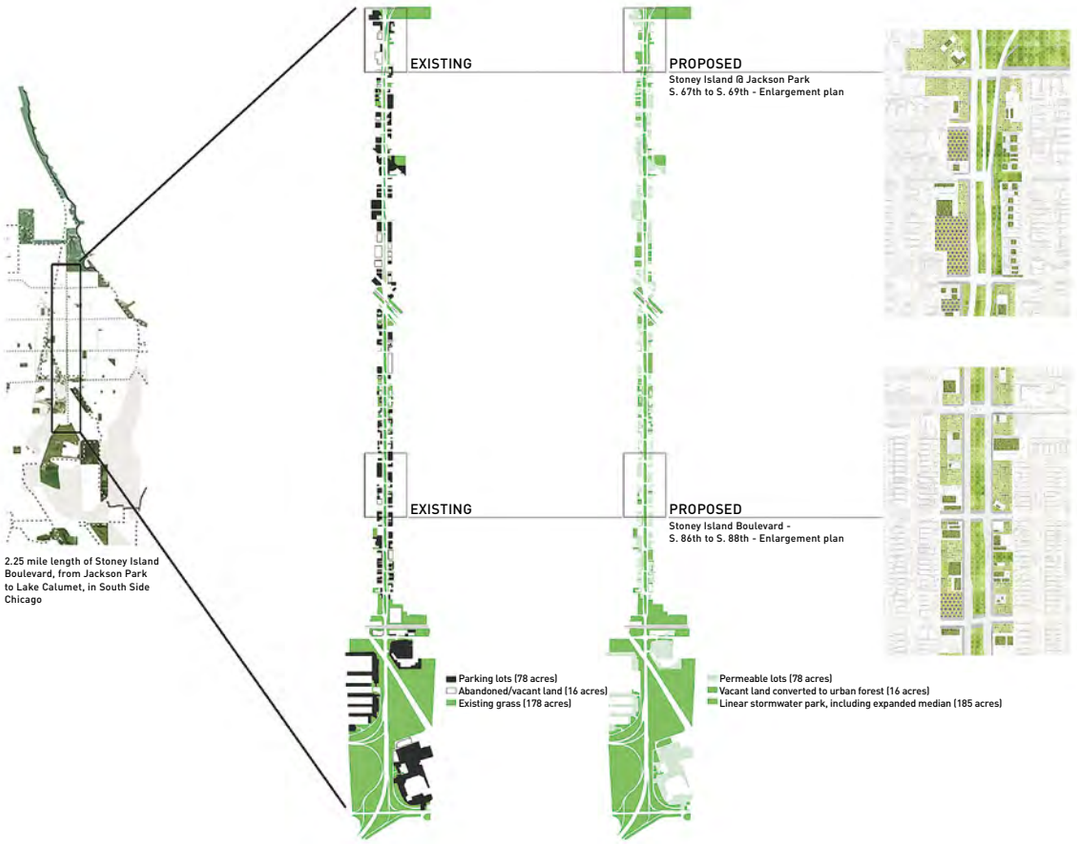


Cluster of Industrial Corridors along the Sanitary & Ship Canal in southwest Chicago



Industrial Corridors in southwest Chicago, example of Little Village surface conversion. There are 16,000 acres of industrial lands in the City of Chicago. (McGuire, produced for City of Chicago Department of Housing and Economic Development)

Illustration: McGuire, produced for City of Chicago Department of Housing and Economic Development



Stoney Island Avenue, example of proposed water boulevard conversion. Streets cover 25 per cent of urban land in the City of Chicago. (McGuire & Gajjar)

crete, necessitating stormwater redesign in order for manufacturers to continue operating in these frequently flooded areas. Two primary design strategies are proposed: the first is to retrofit extensive paved areas to permeable surfaces, utilizing heavy-duty interlocking pavement systems underlaid by deep stone reservoirs to directly infiltrate and store water on-site. The second strategy is to utilize shared utility corridors and roadways as public collection zones, which would slow and redirect water flow.

The example shown is the Little Village Industrial Corridor (1,250 acres), adjacent to a working-class ethnic neighborhood with a low density of park and open recreational space. The example integrates ground plane depaving strategies, linked by a series of collection and infiltration channels, such as gabion-walled channels (similar to qanats) to hold, infiltrate, and slow water before leading it to the canal. Within the utility corridors, naturalized channeling and wetland formation would create habitat for migrating birds and animals. These surface and public way strategies could be applied systematically to industrial lands along the canals and the riverways throughout Chicago. From a water management position, the potential to improve stormwater design in the industrial corridors is a powerful way to regenerate the condition of the corridors themselves. More than 5,000 acres of industrial land exist along the Chicago River, with at least ten miles of linear frontage along the Chicago River and over thirty miles along the Calumet River. Consisting of an astonishing ten per cent of the urban surface, industrial lands, if they were designed to manage a mere inch of rain, would collect 400 million gallons of water in a single storm. Our own research has shown that up to five inches of rain in a 24-hour period can be held and infiltrated if 33 per cent of the site surface were to be redesigned with permeable pavers.[9] Constructing a robust set of stormwater surfaces would boost the protection and performance of these industrial-economic zones and improve equitable and healthy worker conditions.

Soils in the City. The pre-urban landscape history of Chicago also remains an exciting condition for design intervention, particularly as it complements and increases the effectiveness of depaving streets and industrial areas. A resurgent interest in the geological soils of the region has helped us identify strategic locations for green infrastructure retrofits. Particularly notable is the recognition that the surficial landscape morphology of the coastal South Side of Chicago and Calumet region could play a significant role in the city and region's future for water.

Glacial deposition, followed by wind- and water-driven sediment transport, created dune sand and gravel deposits, interspersed with fine-grained lake deposits. US Geological Survey maps and our more recent soil investigations have revealed a range of soil infiltration capacities across soil textures, which allow site selection and surface retrofit strategies to be calibrated to urban soil conditions, alleviating local flooding, recharging groundwater supplies, and potentially returning rainwater to Lake Michigan (currently drained away). The surface area of the dune sand and gravel extents measures over 45,000 acres along Chicago's southern coast. Remnants of this important topography still exist among, and underneath, urban development and industrial landscapes of the greater Calumet region. This creates a significant opportunity to reduce urban flooding and protect people's homes by depaving and resurfacing areas that exist literally on top of these soils. Our work suggests that reasserting these landscape histories and their soils would redefine Chicago's future with water.

Chicago's future with water

Cities and societies face uncertain futures. This article is written during the early months of the coronavirus pandemic – a time when everyone is forced to stop and rethink the sys-

Illustration: McGuire & Gajjar

tems that we take for granted and to reexamine old decisions and their impacts on human health. Parallel and directly related to the public health crisis, our water infrastructure is foundational to the livability of neighborhoods, cities, regions, watersheds, ecosystems, continents, and the planet. In Chicago, the landscape, which was low-lying and seasonally wet, explains why 19th- and 20th-century engineers responded with such control. However, the reported successes of water engineering failed to internalize the ecological destruction that took place and that continues today. Knowledge of the conditions that precipitated control and dysfunction should be better understood and transformed. Reconfiguring the city through large networked landscape retrofits of its extensive street pavements and industrial lands – along with an understanding of the latent soils sitting just underneath the city – is a start. It rewrites the future of the city.

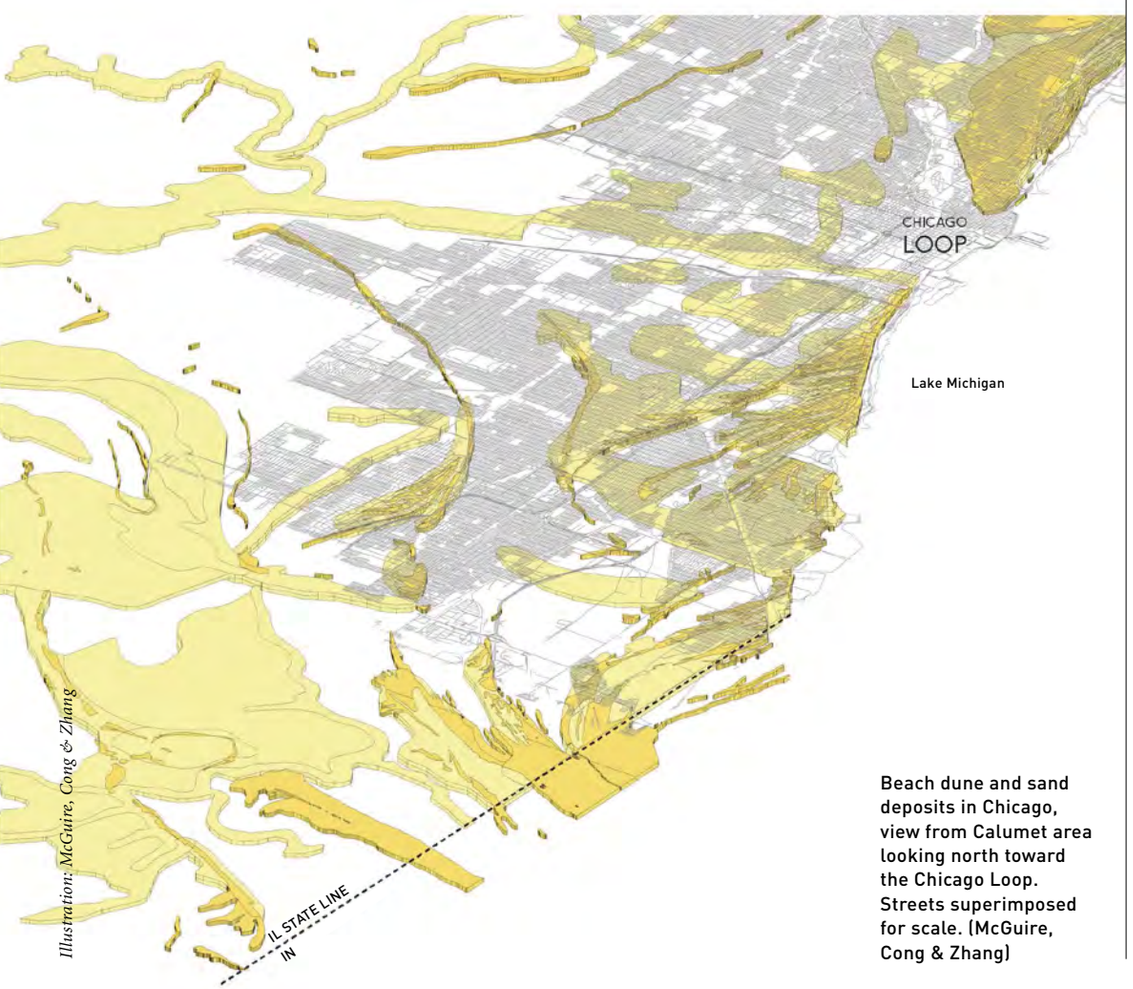


Illustration: McGuire, Cong & Zhang

Beach dune and sand deposits in Chicago, view from Calumet area looking north toward the Chicago Loop. Streets superimposed for scale. (McGuire, Cong & Zhang)

FOOTNOTES

[1] Kaika, Maria. City of Flows: Modernity, Nature, and the City. New York: Routledge, 2005.

[2] Lake Michigan is one of the five Great Lakes, which together hold 95% of North America's fresh water and 20% of the planet's fresh water.

[3] See "Linear Systems" McGuire, Mary Pat. "Points Lines, and Planes: Depaving Chicago," McGuire & Henson, eds. Fresh Water: Design Research for Inland Water Territories. Novato, CA: Applied Research & Design Publishing, 2019, p. 93-96.

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[6] See City of Chicago, Department of Transportation. (2013) "Sustainable Urban Infrastructure Guidelines" [document] http://www.cityofchicago.org/city/en/depts/cdot/supp_info/sustainable_urbaninfrastuctureguidelines.html. Accessed May 3, 2020.

[7] Jackson Park is the location of the proposed Barack Obama Presidential Center, a project that has been contentious for placing development rights above public land-use rights.

[8] Burnham, Daniel Hudson, Bennett, Edward H., and Moore, Charles. Plan of Chicago. New York: Princeton Architectural Press, 1903, p. 5.

[9] McGuire, Mary Pat, David Grimley, Andrew Phillips, and Ashlynn Stillwell. (2018-2020) "Hydrogeological soil research for green stormwater infrastructure planning and design: new methods for adapting urban coastal communities." Illinois-Indiana Sea Grant Program (NOAA National Oceanographic and Atmospheric Association), #NA180AR4170082. Please contact the author for results of this research.

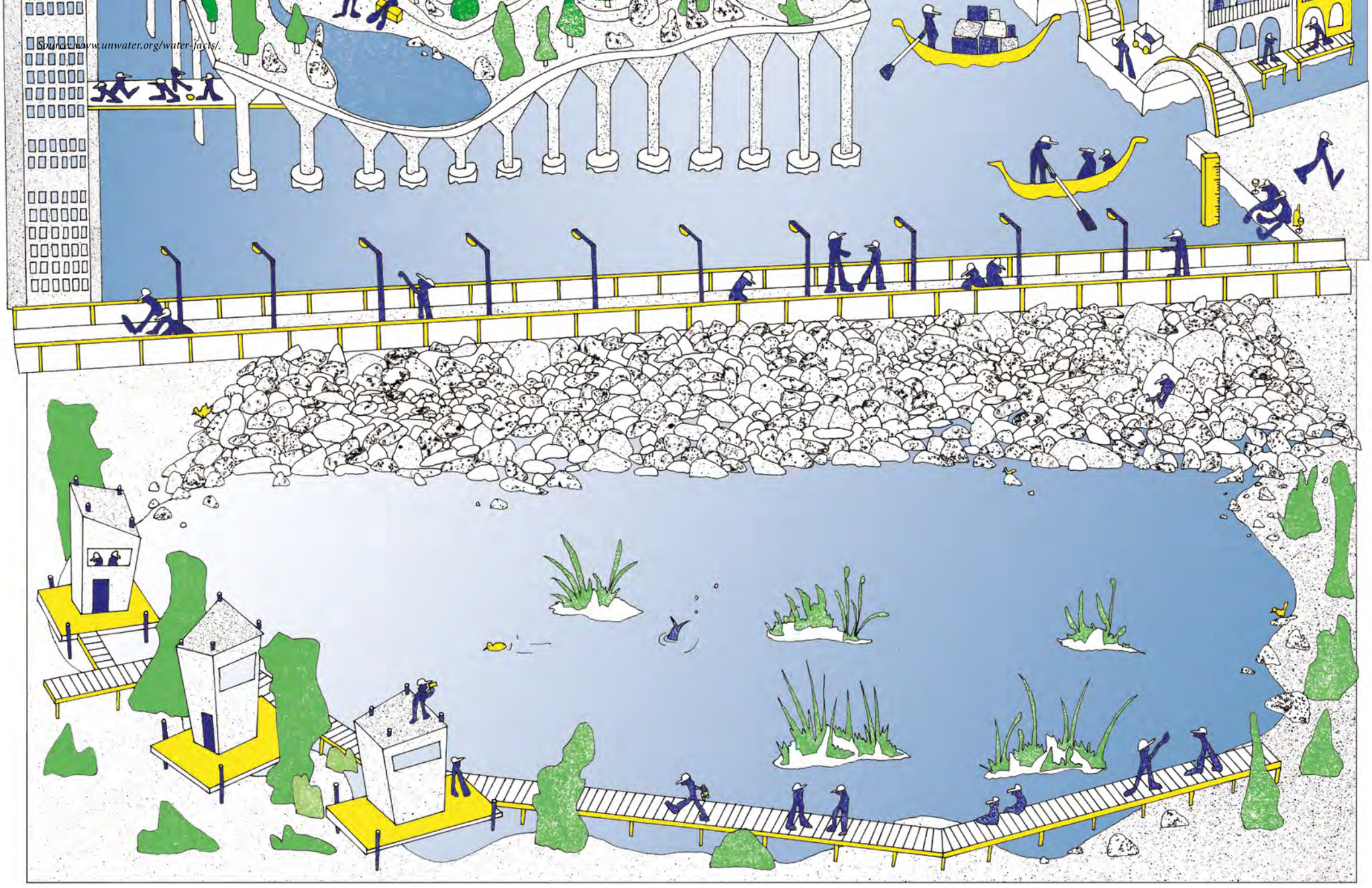
Water

Illustration by Mélanie Corre

With the existing climate change scenario, by 2030, water scarcity in some arid and semi-arid places will displace between 24 million and 700 million people.
(UNCCD)

An average of 25.3 million people are displaced each year by sudden-onset disasters.
(IDMC, 2018)

The world has lost 70 per cent of its natural wetland extent, including a significant loss of freshwater species, over the last 100 years.
(United Nations, 2018)



Source: www.unwater.org/water-facts/

The human right to safe drinking water was first recognized by the UN General Assembly and the Human Rights Council as part of binding international law in 2010.
(UN, 2010)

Globally, it is likely that over 80 per cent of wastewater is released into the environment without adequate treatment.
(UNESCO, 2017)

Over 2 billion people live in countries experiencing high water stress.
(UN, 2018)

145 states have territories within transboundary lake or river basins, and 30 countries are located entirely within them.
(UNECE/UNESCO 2015)

In urban areas, the main challenge is often a lack of access to basic services in informal settlements, or high prices and a lack of quality control of water from private vendors.
(WHO, 2017)

Today 1 in 3 people or 2.2 billion people around the world lack safe drinking water.
(WHO/UNICEF 2019)

Towards a new Vernacular

Back to the roots or rather a giant leap into the future? Both is correct, if you think of landscape architect and environmentalist Julia Watson's Lo—TEK approach. Lo—TEK: Design by Radical Indigenism is about valuing indigenous philosophies and learning from vernacular architecture. Lo—TEK provokes a new conversation by challenging planners to expand their understanding of nature-based technologies and generate new, sustainable and resilient infrastructures.

JULIA WATSON
CO-AUTHORS: DESPINA LINARAKI AND
AVERY ROBERTSON

Las Islas Flotantes is a floating island system on Lake Titicaca in Peru inhabited by the Uros, whose culture is based on the locally grown totora reed.

Photo: Enrique Castro-Mendivil

In January 2020, flooding in the city of Jakarta displaced almost half a million residents.[1] Vulnerable to coastal and river flooding, rising sea levels and accelerated subsidence, this Indonesian city of ten million has called upon the world for high-tech water management solutions.[2] In 2014, Jakarta collaborated with the Dutch government to apply their dyke concept to the coastline in a 40 billion dollar proposal for multiple seawalls, new shorelines and its own version of Dubai's Palm Islands, in the shape of the mythical garuda bird, giving it the name of the "Great Garuda Plan".[3] The timeline had set a completion date close to 2050, when an estimated 95 per cent of Jakarta will be underwater.[4] While focusing on sea level rise, plans such as this favor single purpose infrastructures and may worsen vulnerability over time, in this case by ignoring groundwater depletion and exacerbating pollution.[5]

Many mainstream solutions to rising sea levels comprise of high-tech, hard protection strategies designed by and for affluent metropolises. These expensive fortification measures are proving to have less long-term resilience than the coastal environments they replace. Instead of protecting the entirety of the coastline, they often transfer the problem to adjacent areas, by reflecting wave energy, causing erosion and disrupting ecosystems. While this approach might involve a complexity of monitoring systems and engineered materials, it fails to use the most valuable and readily available resource – biodiversity. Applying one-size-fits-all approach for resilient design is unsuited to ecosystems and inconsiderate of the resource availability and economic feasibility of individual cities and communities. In looking for solutions for the whole planet, we cannot follow the current mythology of technology that calls for a scaling of costly, high-tech and hard infrastructural strategies. We need to look elsewhere: at effective responses that are symbiotic with specific environments and the available resources.

Sawah Tambak of the Javanese, Indonesia. An alternative adaptation strategy for the intertidal lands in Jakarta can be discovered nearby, heading east along the coastline of Java. Where the coastal lowlands continually flood, a uniquely Javanese aquaculture technology called the sawah tambak has evolved. This is the highest yielding indigenous rice-fish infrastructure in Indonesia and it is specifically designed to perform at an elevation of one to two meters above sea level. In the 1980s this system was practiced on 16,500 hectares of land, yielding 35,000 tonnes of fish annually and supporting 15,000 households.[6] The sawah tambak system has expanded over the years to other areas of East Java, now inhabiting the basins of the Brantas and Solo Rivers.[7] Both preventative and productive, the system mitigates deluge or drought, while maintaining a thriving habitat for many species and a continuous food supply for the local community.

While in form similar to the Dutch polder-dyke, including a berm, canal and pond, the sawah tambak performs in a remarkably different way. Rather than building coastal berms and drying up intertidal ecosystems in the transformation to arable land, the sawah tambak is built with existing resources; forming berms from soil excavated for a peripheral canal and maintaining an aquatic environment for farming. The system initially evolved by converting silt-laden, brackish water fishponds into rain-fed rice fields, in this way making the locals' livelihoods and infrastructures accommodating to water-level changes.

Lo—TEK

Adapting an agricultural system into a resilient infrastructure will be a more successful systemic approach to mitigating global climate impact than introducing a single purpose infrastructure developed in a distant climate for a different condition. Adaptive resilience can be achieved by building biodiversity and amplifying ecosystem services to increase performance – a strategy already practiced in many indigenous communities. Categorizing the following indigenous innovations in accordance with the definition of advancing or accommodating responses from the IPCC 2019 Special Report on the Ocean and Cryosphere in a Changing Climate – accommodating being letting the water in, advancing being extending new land into the water – furthers our contemporary resilient design approach. Technologies such as the sawah tambak already embody the construction techniques, climate, soil quality, precipitation levels and seasonal understandings of the local culture and the intertidal ecosystem that evolved it. These technologies are familiar and proven, having succeeded for years with the custodianship of experienced caretakers. They expand intertidal materials and amplify ecosystem services rather than erasing them. These systems may be used instead of sea walls for the successful protection of coastal communities, utilizing tidal fluctuations to enhance local food production and coastal biodiversity.

These indigenous infrastructures are Lo—TEK. Adapted from the word lo-tech but incorporating the acronym TEK, which stands for Traditional Ecological Knowledge, they are nature-based technologies that harness the energy and biodiversity of the complex ecosystems they inhabit. Forming the foundation of indigenous technologies, TEK is a field of study in anthropology that is defined by ecologist Fikret Berkes as a cumulative body of knowledge, practice, and belief; handed down through generations by traditional songs, origin stories and everyday life.[8] Continuing the conversation on vernacular architecture as popularized in Bernard Rudofsky's Architecture without Architects, Lo—TEK is located at the intersection of design and radical indigenism. Lo—TEK is a design movement to rebuild an understanding of indigenous philosophy and vernacular architecture that generates sustainable, climate-resilient infrastructure.

Design by radical indigenism is critical to communities most vulnerable to climate change, who lack the capital and resources for costly, high-tech infrastructures. People living in impoverished circumstances in developing nations are sold the belief – a mythology of technology – that imported solutions are superior to local innovations, even though the latter embody the intelligence of the environments and cultures that evolved them. These indigenous technologies that are ignored by the world also remain undervalued by their local communities. The concept of radical indigenism, which was coined by Princeton Professor and citizen of the Cherokee Nation Eva Marie Garoutte, argues for a rebuilding of knowledge and understanding of indigenous philosophies from their roots. For the field of design, this rebuilding can expand our understanding of nature-based technologies and generate new, sustainable and resilient infrastructures informed by TEK. Lo—TEK provokes a new conversation by challenging designers to champion new knowledge and technologies that can evolve today's toolkit of climate-resilient design. The following are several indigenous innovations that expand our advancing or accommodating responses, as outlined by the IPCC.

Advancing

Mulberry Dyke and Fish Ponds in Huzhou, China. Investigations across the globe reveal a diversity of vernacular variations on the typical polder-dyke infrastructure. The Chinese mulberry dyke and fish pond system has been a productive closed loop system for 2,500 years, in which each element provides nutrients for another in a cycle. Several agricultural practices working in symbiosis create this complex agricultural system, which also functions as a flood mitigating water reservoir located within the Zong Pu Heng Tang water management and flood prevention system.[9] The mulberry dyke fish pond system manifests as an array of ponds divided by narrow tree-lined banks and rivers stretching across the landscape. These elements make up the structure of the complex system. Located in the northern, suburban landscape of the city of Huzhou, this system involves embankments that often double as roads, on which mulberry trees are grown. These trees provide leaves for silkworms to eat; the silkworm feces and chrysalids then fall into the adjacent pond, providing feed for a variety of fish species, which are chosen according to the depth of water they inhabit.[10] The fish feces, along with the unconsumed silkworm and mulberry waste, are then decomposed by aquatic microorganisms, which produce nitrogen, phosphorus, and potassium, finally returning to the mulberry tree roots when the mud is dredged from the bottom of the pools and applied to the banks as nutrient-rich manure. Here the cycle begins again, maintaining the biological balance of the pond without the use of chemical pesticides or fertilizers, while providing a supply of fish and silk for commerce and consumption.[11]

Asi Asi Artificial islands of the Malaitan, Solomon Islands. Coastal cities have historically expanded land through fill and in this common process sacrificed essential ecosystems and the resilience benefits they can provide. The Asi Asi artificial islands of the Solomon Islander community of Malaita alternatively expand both land and ecosystems. For the last 300 years, these saltwater people have been inhabiting and constructing islands in the Langalanga Lagoon; an ideal location for island creation, being protected from strong waves and storms by a surrounding reef and mangrove forest.[12] To build an island, a timber raft is first layered with locally sourced coral rock and floated to a site. There, it is layered again with coral stones, sunk and piled up to form level land above the highest tide, accommodating the height to sea level changes. After filling in the rubble with fine coral sand and soil, stilted houses are built and vegetation is planted so that it will eventually grow to bind the subsurface coral rocks together.[13] Today, a total of fifteen islands range in size from one-tenth to twelve hectares, expanding the local ecosystems and enhancing the natural biodiversity.

1. Built by the Tofinu, the city of Ganvie meaning, we survived, floats on Lake Nokoué surrounded by a radiating reef system of twelve thousand acadja fish pens.

2.The twelve thousand acadja aquaculture pens form a dense artificial reef which replicates a mangrove ecosystem, attracting fish and wildlife.

3. The view from above the mulberry dyke and fish pond system shows the ponds separated by mulberry planted embankments.

4. Satellite image from Google Earth at 2km altitude. The image shows the coastal sawah tambak aquaculture system in Central Java, facing the Java Sea.

5. Qasab reed has long served as raw material for homes, handicrafts, tools, and animal fodder with the distinctive mudhif houses of the Ma'dan people appearing in Sumerian artwork from five thousand years ago.

6. The Uros build their entire civilization with the locally grown totora reed, a cultural keystone species.

7. It has been estimated that almost 12,000 Malaita people in the Langalanga and Lau Lagoon live on the artificial islands. Sizes range from being large enough to support ten to fifteen families to a lone house standing above the waves.

8. Large populations of fishermen live in floating huts, called khangpoks, supported by the phumdi's natural buoyancy.

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Photos: Iwan Baan (1); Mbrand (2); Jianyi Dai - Food and Agriculture Organization of the United Nations (3); Google Earth (4)

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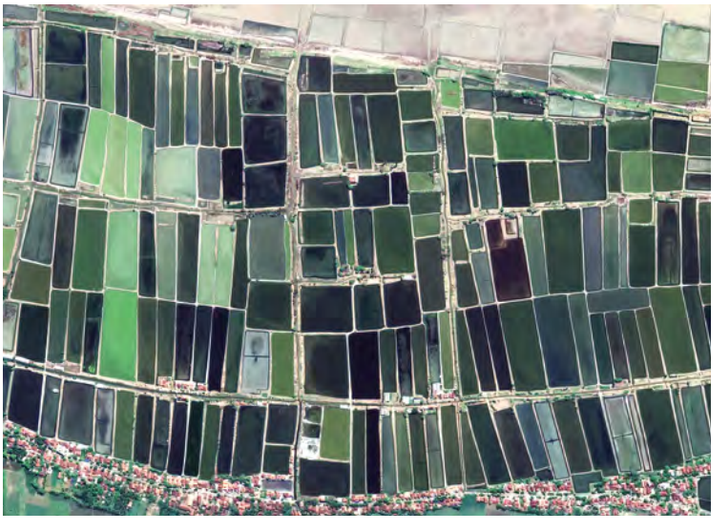

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Photos: Esme Allen (5); Enrique Castro-Mendivil (6); Piero Scaruffi (7); Sharada Prasad (8)

Accommodating

Successful and sustainable island infrastructures from peoples like the indigenous Uros of Peru, the Ma'dan of Iraq and the Manipuri of India can offer alternative futures for communities living with, on or along water. Aquatic civilizations, who for generations have been confronting the same crisis we now face, continue to be overlooked, rather than being looked to for their ecological intelligence that is imperative to the evolution of sustainable, hybridized, aquatic nature-based systems. These investigations are critical as floating cities, designed on the grounds of high-tech, begin to flourish.

Al Tahla Floating Islands of the Ma'dan, Iraq. The Ma'dan of Iraq, known as the Marsh Arabs, have survived for 6,500 years in the Southern Wetlands of Iraq with floating island technologies that rival contemporary, non-biodegradable islands. They have evolved simple, habitable, adaptable, versatile and biodegradable buoyant infrastructures using a single reed species known as the qasab to construct the entire built environment. Their floating villages known as Al-Tahla are constructed on man-made islands that can survive for twenty-five years, and are topped by houses constructed in as little as three days, from the same reeds.

Totora Reed-Floating Islands of the Uros, Peru. Likewise, the floating islands of the Uros in Peru are built entirely using the totora reed and are simultaneously a floating village, aquaculture farm and artificial wetland, synthesized into a single, living infrastructure. The islands are designed for mobility and are secured with anchors, allowing them to be moved to deeper waters. Buoyancy is achieved by amplifying multiple natural processes of decomposition, while natural water filtration is performed.

Phumdis and Athaphum of the Manipuri, India. Spreading across 70 per cent of Lake Loktak in India, phumdis are naturally floating land masses composed of vegetation, decomposing organic matter and peat - a black soil that has thickened into a solid and spongy form.[14] 100,000 local Manipuri people rely on the lake for their livelihood. Many of them use the phumdis to build houses called khangpoks atop, or to create athaphum, which are ring-shaped island enclosures used for fishing, measuring 100 meters in diameter and three meters in width.[15] With one-fifth of the structure above water, four-fifths remain submerged below; the high concentration of vegetation matter gives the islands their natural buoyancy. During low tide, when Loktak Lake's water level drops, the phumdis' living roots reach the lake bed and absorb essential nutrients, resurfacing after spring. In this lake environment, the organic islands act as natural biofilters, enhance biodiversity and wildlife habitats, and provide a land base for the construction of huts and fishing infrastructure, all while accommodating water level fluctuations.

Acadja Aquaculture of the Tofinu, Benin. Amplifying biodiversity through aquaculture in a different way, the Tofinu people of Ganvie constructed this watery city and artificial reef in Lake Nokoué. Ganvie, a city at the southern end of Benin, is the largest lake city in the world. It is surrounded by the artificial reef of 12,000 fish paddocks known as acadjas, which cover almost half of the surface of the brackish lagoon and feed the one million people living around the lake.[16] Using branches cut from the shoreline mangrove forest, the Tofinu fishermen begin to replicate a mangrove ecosystem by planting a dense mass into the muddy floor of the shallow lake. Around the mass, an underwater paddock is constructed and stocked with thousands of fish fry, who feed on the detritus and algae from the rotting branches. As an individual paddock, the system is quite insignificant, but when multiplied by 12,000 while remaining chemical-free, it forms a large-scale system found to bring incredible benefits to the lake's biodiversity that are unheard of in industrial-scale aquaculture.[17]

Remembering an ancient mythology

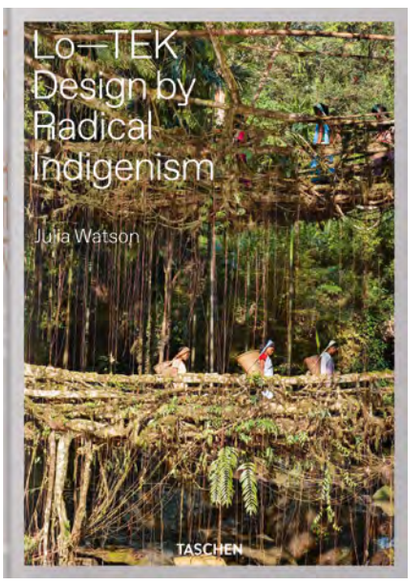
Lo—TEK shows that nature-based solutions to climate change can be active, adaptive, and productive by involving co-existences of many species, and using biodiversity as a building block; thereby harnessing the energy and intelligence of complex ecosystems. This is how humans have been dealing with the extremes we now face for millennia. It counters the idea that indigenous innovation is unsophisticated and primitive, instead aligning to today's sustainable values of low-energy, low-impact, and low-cost. Climate change is showing that our survival is not dependent upon superiority, but upon symbiosis, and that shifting our thinking from survival of the fittest to survival of the symbiotic, is a critical first step.

As we drown in this Age of information while starving for wisdom, we find ourselves at a crossroads: We can continue a narrow view of

technology informed by our distance from our natural environment, or we can acknowledge that this is just one way and not the only way for humans to live. Lo—TEK: Design by Radical Indigenism is inspired by an ancient mythology – that humankind can and must live symbiotically by harnessing the intelligence of the ecosystems around us. Imagine what we might discover by looking to the many hundreds of communities who have been scaling sustainable, symbiotic systems for millennia.

LITERATURE

AUTHOR: Julia Watson
TITLE: Lo—TEK
Design by Radical Indigenism
PUBLISHER: Taschen Publishing House
Cologne, November 2019



FOOTNOTES

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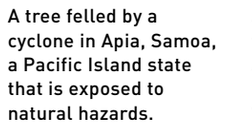
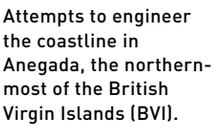


A tree felled by a cyclone in Apia, Samoa, a Pacific Island state that is exposed to natural hazards.



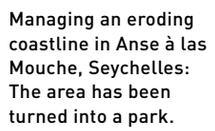
Attempts to engineer the coastline in Anegada, the northernmost of the British Virgin Islands (BVI).

Island Waters and Climate Change

The impacts of climate change on water are typically constructed as being clear and present dangers for islands and islanders, especially in the tropics. The suggested negative outcomes are actually not as certain as often presented, because water-related difficulties depend much more on long-standing, pre-existing issues rather than on what climate change brings. Climate change tells part, but not all, of the water story of islands.

ILAN KELMAN

Photos: Ilan Kelman



Designed to protect: The capital of Maldives, Malé, is already mostly surrounded by a sea wall.

Managing an eroding coastline in Anse à las Mouche, Seychelles: The area has been turned into a park.

Major ocean-related changes as a result of climate change include sea level rise and ocean acidification (IPCC, 2013-2014), but neither will necessarily destroy islands or islanders. Observations of low-lying islands, especially in the Pacific, identify ongoing sea level rise and ocean acidification, yielding mixed outcomes. Some islands are indeed eroding and disappearing, but some are expanding, some are changing shape in area or volume, and some are not affected much (Kelman, 2018). The physical changes to the oceans have knock-on effects which could affect islanders in other ways. Freshwater is almost always scarce on islands, especially atolls. The so-called freshwater lenses under many of them are becoming increasingly salty, contaminating drinking water and undermining irrigation, with increased evapotranspiration adding to water scarcity (Falkland and White, 2020). Desalination is costly and requires imported equipment (Howell and Fielding, 2019), leaving islanders with few low-cost options for maintaining a freshwater supply.

Meanwhile, ecosystems are changing with the oceans, particularly as heat is absorbed from the atmosphere. Islanders relying on traditional or local knowledge are finding that some of this is becoming outdated in terms of not always knowing how to read environmental conditions or when and where specific species can be harvested (Johnston, 2015). Even if changing ecosystems bring more fish or more productive plants, the islanders might not know how to increase their food supply because their traditions have been undercut.

Despite these major changes to island life, claims are premature that climate change immediately wrecks or will inevitably ruin islands and life on them. No one knows what will happen, since the worst impacts are still to come (IPCC, 2013-2014). Consequently, islanders have a confusing time in planning for and adapting to the future, not knowing if it would be better to remain, in case they are able to continue and adjust their island life, or if their homes will vanish over the next few years or decades and they will have to migrate.

Move or stay?

The forced migration of islanders, or alleged "climate refugees", from their drowning homes has numerous provisos and uncertainties. First, in international law, the definition of "refugee" does not include leaving for environmental reasons (UNHCR, 1951/1967). Until a country or the international refugee system recognises people migrating involuntarily for environmental reasons, climate change cannot be used to accord refugee status. Second, mobility studies have long shown that migration is a usual human condition, not an exception, and, typically, has strong advantages for the origin and destination locations (Fiddian-Qasmiyeh et al., 2016; Lancet Migration, 2018). Islands were discovered and settled in the first place due to migration, with the ocean serving as the islanders' highway (Hau'ofa, 2008). Even though people have been exiled due to crimes or forced to move due to environmental conditions or conflicts, migration has generally been voluntary. It was part of the social norm of being an islander and helped to avoid overusing local resources by having some of the population emigrate. Choosing to migrate previously or now does not justify forced migration. When islanders migrate today or in the future, it should be their choice, rather than being forced out because of climate change's impacts. To assist with this decision-making process, science and policy provide three principal categories of actions (IPCC, 2013-2014; Kelman, 2018; Yamamoto and Esteban, 2014).

First, build walls around the island and/or raise the land. Many coastlines are already entirely engineered, some with solid monoliths and others more creatively. Artificial islands and reclaimed land are a mainstay around the world, from Hong Kong's airport to luxury properties on the United Arab Emirates' Palm Islands to the Netherlands. Land is created through techniques such as draining swamps, adding sand and soil until it rises above the water, or building concrete structures (Dodds and della Dora, 2018), which yields concomitant legal hurdles (Papadakis, 1977). Many initiatives have a lengthy history. The capital of Maldives, Malé, is already mostly surrounded by a sea wall, with a causeway connecting it to both the international airport and a residential island, much of which has been reclaimed. The effectiveness of these measures has been mixed, given that the tsunami on 26 December 2004 swept over the entire island, and drainage needs to be improved since the streets are prone to sudden flooding during rainstorms. As another example, during World War II, the capital of Tuvalu, Funafuti, was artificially expanded to permit the building of an airport, with the runway often getting damp as seawater seeps up through what used to be swamp. Another vision is constructing islands that float on the waves, which are either anchored to the seabed or roam a country's territorial waters (Yamamoto and Esteban, 2014). They would adapt to any level of the ocean and, if mobile, could dodge incoming storms.

The second category involves changing lifestyles to deal with saltwater and a continually morphing shoreline. Some coastal peoples, such as in Guyana, raise their dwellings so that they live in the upper floor rather than the regularly flooding ground floor. Land could also be raised by piling and compacting soil, followed by building atop the higher land. Many areas around Sendai, Japan did this following the 2011 tsunami in order to rebuild above the expected tsunami height, although it is as yet unclear how well this higher land will hold together during an earthquake. Other peoples developed their cultures around

Photos: Ilan Kelman

the water-land interface, residing in structures on the water as much as on the land, such as living in boats in Burma, on ever-shifting river islands in Bangladesh, or in marshes in Iraq.

The third approach is to permit the water to conquer the land while people move away. Hilly islands might afford space for resettling on the same island, with the people continually moving higher as needed. Atoll countries such as Tuvalu and the Maldives might need to be evacuated, unless there is enough accretion due to sea-level rise. For the hillier islands, such as many in Fiji and Samoa, customary land tenure practices mean that resettling people is not straightforward (Chapelle, 1978). Cultural norms and current ownership would need to be adjusted, which is challenging without disadvantaging many by taking land away from them, since compensation might not make up for traditional respect for ancestral plots. For other islands, such as Barbados, it just means requisitioning golf courses (Potter and Phillips, 2004) – an act which might meet more resistance than expropriating land from the poor.

Aside from forced relocation not being inevitable, it is not easy to enact fairly and equitably. Betzold (2015) summarises the debates about whether forced resettlement away from a retreating coastline is really climate change adaptation or is instead a failure to adapt properly through other means. Is it really the changing climate forcing the move or a human inability to help people in other ways?

Floods and droughts

The same argument, that it is not climate change per se causing problems but human reactions to the impacts, applies to other water-related effects climate change has on islanders, notably floods and droughts. For tropical cyclones, climate change models project (including the Caribbean and Pacific) that intensity will increase, but frequency will decrease (Bacmeister et al., 2018; Walsh et al., 2016).

The baseline challenge is thus not a changing storm regime, but lack of preparation for storms when people forget previous disasters or feel that disaster prevention is a low priority, because the last one was so long ago (Hoffmann and Muttarak, 2017). Some islands experience decades-long gaps between landfalls and, if tropical cyclone frequency decreases, then readiness might decline even further. The fundamental challenge is not how the climate is changing and thus affecting storms; it is how to instill a culture of dealing with risks, especially in places where immediate problems subsume life, such as having trouble putting enough healthy food on the table each day. The double burden of obesity and malnutrition is prevalent, for instance, around the Pacific, leading to numerous and continual deaths from non-communicable diseases (Swinburn et al., 2011). Rather than preparing for an infrequent storm, people might downplay readiness on the presumption that post-disaster aid will be forthcoming (Tuiloma-Palesoo, 2004). In Fiji, Johnston (2015) found that communities which had received more post-cyclone aid were less prepared than those that had previously received limited assistance. To overcome this challenge, one approach is to provide opportunities for day-to-day livelihoods and services, so that basic needs are satisfied and then everyone can be encouraged to consider risks and difficulties which are longer-term (Hewitt, 1997). Knowledge exists about building houses that withstand storms and identifying floodplains. The real difficulty is ensuring that residents have the opportunities, resources, and power to demand that this happens. Where it does not, we can hardly blame climate change for these choices. Instead, we need to blame those who have the power, resources, and knowledge to prepare for water-related disasters, but choose not to do so, which makes everyone vulnerable to climate change and other environmental phenomena. After Antigua and Barbuda gained independence in 1981, it soon became known as a centre of corruption, with its reputation improving only after the ruling family dynasty was booted from power. Tourist resorts in St. Lucia and St. Kitts are seen as bringing jobs, but many of the profits leave the island. These mismanagement decisions, fuelled by exploitation from external parties, are entirely human-caused, irrespective of what the climate or water do, and they remove resources and options for people to reduce their vulnerability (Hewitt, 1997; Lewis, 1999).

It's the same with droughts, which are typically caused much more by human (mis)management and the (over)use of water than by rainfall variations (Glantz and Katz, 1977; Wilhite and Glantz, 1985). Climate change is expected to increase dry periods and evaporation in many island locations (World Bank, 2000), with drinking and washing water already lacking because too many people have moved to a settlement which never had enough freshwater in the first place. South Tarawa, Kiribati is expecting worse droughts due to climate change, especially within the ENSO cycle (World Bank, 2000), but Lal and Datta (2019) explain that the main problem with freshwater in South Tarawa is over-extraction as more and more people settle there.

All these water-related difficulties already existed without climate change. Adapting to climate change means dealing with flood and drought predicaments that should have been addressed anyway. Climate change is altering precipitation frequencies, intensities, and locations, as well as evaporation rates. Climate change must be factored into islanders' water management, but these decisions cannot be effective without admitting and solving the fun-

damental causes of the problems, namely our choices regarding where and how we live, and especially how we use water.

Wider contexts

Any potential consequences of actions must be considered. Could making houses in Dominica more robust in hurricanes by giving them heavier roofs lead to more earthquake deaths if the roofs crush inhabitants? Could salt-tolerant crops change people's nutrition or hike their salt intake, leading to high blood pressure and heart disease? If people transform their country to live amphibiously with two metres of sea-level rise, what happens if we see three or thirty metres? Where water-related planning and design decisions are only short-term, local, and immediate – or focus on a single issue such as climate change – significant harm can result.

At Anegada in the British Virgin Islands, a row of cottages was undermined by a storm in 2010, reconfiguring the beach and leading to reinforcement of the shoreline in order to permit reconstruction. The real question is not about how to protect leisure-oriented structures from storms or climate change impacts. It is about how to create a long-term future for Anegeda in the face of multiple, combined risks, including sea-level rise, ocean acidification, heat, floods, droughts, tourism dependency, the rich-poor gap, and about ensuring nutritious food, clean water, education, adequate health care and fulfilling livelihoods for all residents.

For the best islander life, climate change must be factored in, but should never dominate. Through a balance of internal strength and external support, islanders can continue living with water both on and surrounding their islands, rather than the sea and rain merely becoming the islands' enemies.

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Angola's fisher people at the Cuanavale river in the province of Cuando Cubango: Wooden dugout canoes are one of the most popular fishing tools of small-scale fishermen.

“We humans are extremely resistant to progressive change when it comes to the intelligent use of our resources.”

On the search for water: for his “African Waters” project, the German photographer Florian Wagner travelled through ten African countries by helicopter. His intention went beyond showing the continent’s beauty; his mission was also to create greater awareness for one of the most valuable resources: water. The result are impressive aerial images of African water landscapes as well as empathic photos of people in Africa and their often complicated relationship with water. topos had the opportunity to speak to the photographer about “African Waters”, the prospects of good water management and his own new relationship with water.

INTERVIEW: ANJA KOLLER

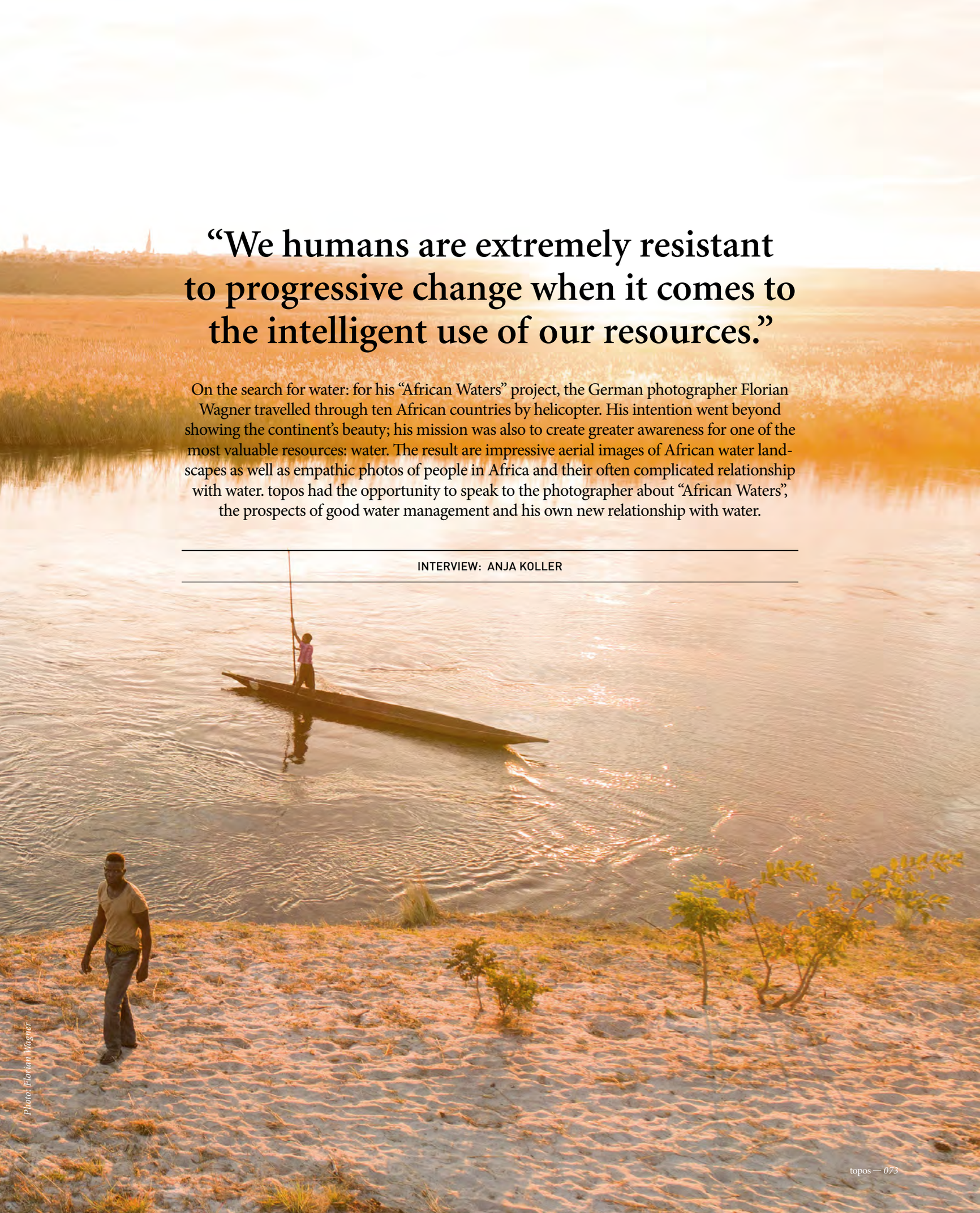


Photo: Florian Wagner

The Okavango Delta in Botswana was formed by the Okavango River flowing into the Kalahari Desert from the Angolan Highlands, creating a unique wetland. It reveals a wealth of flora and fauna, such as the Red Lechwe Waterbuck.

A challenging access to drinking water: a woman is drawing water from a well – not very far from Kanama and Mukamira, Western Province, Ruanda.

Photos: Florian Wagner

Arusha Region of Tansania: the life of Massai Women often consists of carrying and transporting water. From their homes, it takes an often six to eight hours long walk to reach the watering places and wells.

Chris Horsefall with one of his fish breeding tanks at Lake Tanganyika. The lake contains 17 per cent of all standing freshwater reserves worldwide.

Photos: Florian Wagner

VITA

FLORIAN WAGNER (b. 1967) is a photographer, paragliding instructor and helicopter pilot based in Munich, Germany. His work explores wildlife, outdoor sports and the environment. Besides having been published by German newspapers and magazines (Süddeutsche Zeitung, national Geographic, GQ), his work has been exhibited nationally and internationally.

topos: Mr. Wagner, you visited ten African countries – Tanzania, Malawi, Zimbabwe, Botswana, South Africa, Namibia, Zambia, Angola, Rwanda and Mozambique – and you travelled, with your team and your camera, more than 18,000 kilometres by helicopter. What was your main motive for embarking on this journey? What were you looking for, what did you find?
WAGNER: I was looking for water; the aim of the project "African Waters" was to call attention to water as a most valuable resource. Which it truly is. In Mozambique, for example, less than a third of the overall population has access to healthy drinking water. What is paradoxical, however, is that on my travels in Africa I came across endless amounts of water. The real problem is often not water scarcity but vastly insufficient water management.

topos: Can you explain that more precisely?
WAGNER: Of course. Let's take Lake Tanganyika as a case in point. It is Africa's second largest lake and the world's second-largest freshwater resource. The lake is 673 kilometres long, up to 72 kilometres wide and covers a surface of more than 30,000 square kilometres. It is shared between four countries, Burundi, Congo, Tanzania and Zambia. Congo possesses the majority of the lake, which belongs to the country's western region. Here coltan is mined, a metallic ore that we need for building cell phones. Coltan mining pollutes the lake. In addition, there are no sewer systems anywhere along the western coast. Wastewater and feces run directly into the lake. The people who live along its shore use the water of the lake for cooking, doing the laundry and washing themselves. Polluted water, as we know, is the cause for diseases like malaria, high levels of infant mortality, etc. This negligence in the handling of a valuable resource like water, the atrocious management – often born, to be sure, out of necessity – has disastrous consequences for the entire population.

topos: In your photos, you show the links between healthy water bodies, access to the valuable resource they hold, a diligent water management and people's lives and often survival. You have not only produced stunning images of water landscapes but you also took photos of local people and show their relationship with water. Women and children fetching water, for example…
WAGNER: Indeed, in many African countries, especially in rural regions, fetching water is a full-time job. It's a task for women and children above all. Often, they walk six to eight hours per day just to carry home the water needed for cooking and washing. Everyone in our team felt reminded of how crucially important access to water is, how many other things depend on that. Organisations such as Viva con Agua that work to ensure that all people worldwide have access to clean drinking water, for example by funding the construction of wells, are a huge help. A well determines the entire living situation of those in its proximity. It means clean water, fewer health risks, but also easier lives for women and children. Women especially benefit from a close-by access to water because their lives are no longer reduced to being a water carrier. They can take a job, earn money, contribute to the family's livelihood and thereby strengthen their role in the family and their status in society. For children, access to water means getting an education, having a future: once they no longer have to spend hours carrying water, they can go to school.

topos: That seems to be a simple equation, nevertheless for many it is unsolvable. To manage water well – in harmony with nature and the humans who depend on it and live along the water's edge – is a challenge. Even more so when economic and political interests factor into it. Can you share a few exemplary observations, encounters, insights that you had on your trip through Africa?
Wagner: I would like to come back to Lake Tanganyika. Along this vast water body, fishing is the livelihood of many people. However, due to overuse and overfishing the entire ecosystem of the lake

Photo: Regina Singelnstein

is being thrown out of balance. This is a problem for both nature and humans. At the lake, I met a very dedicated man, Chris Horsefall, who has committed himself to combat the overfishing of Lake Tanganyika. He founded an aquaculture project called "Micro Fish Farms". Here indigenous fish are being farmed in small "tanks". Smaller communities in particular profit from this project, as the fish from the tanks are a sustainable and easily accessible source of protein. The more such projects are realised, the more the lake has a chance to recover.

Another example is the Okavango Delta in Botswana, which also has a unique, yet endangered ecosystem. Covering more than 15,000 square kilometres, it is among the largest and most animal-rich wetlands on earth. Its lifeline is the river by the same name, the Okavango. The river's waters flow from the Biè highlands in Angola across Namibia's Caprivi Strip before flooding the delta. Both countries are increasingly using the water for agricultural irrigation, power production, etc. It's about profit-making. Asian investors for example have bought large swathes of land for growing rice. If these kinds of developments continue and the policymakers of these countries do not change course, the delta will eventually dry up. This would not only destroy the living space of innumerable species of animals but also the livelihood of more than one million people who are dependent upon the headstreams of the Okavango for their water supply.

It has been a sobering realisation for me that in a country – I mentioned the example of Mozambique earlier – where most people do not even have access to clean drinking water, protection of the environment plays no role, in fact cannot play a role. It has an effect on you when you stand in the middle of a fascinating landscape and you see litter in many places. But there are also positive cases: Rwanda, only 15 years after the genocide, declared a war on litter. Today it is one the cleanest countries I have ever visited. Plastic is outlawed and littering is punishable by high fines and prison sentences.

topos: Mr. Wagner, what did you take back to Germany from your African journey? Are there any lasting insights?

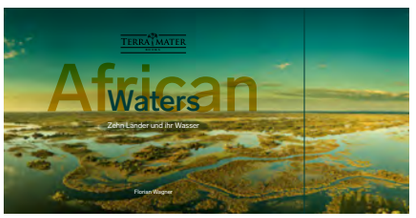
WAGNER: I photographed breath-taking landscapes, I had the opportunity to observe a flora and fauna that is absolutely exceptional and whose existence is deeply intertwined with the protection of its living spaces – oceans, rivers, lakes and wetlands. I met humans whose precarious living situation is directly linked to water, i.e. its quality and access to this resource. I met people who are engaged in the protection of water bodies. All this I carry out into the world with my images. As such my work is a public relations effort for Africa, for the protection of water bodies, for water as a resource. And of course my own relationship with water has changed. I would love to see all of us devote more energy on ensuring that access to clean potable water becomes a standard amenity for everyone. Most of the wars humans have fought so far were about wealth, religion and power. None of that is needed for survival. If water becomes a real scarcity – and we see that looming not only in many African places – enormous hardship will trigger migrations and thus new conflicts across the world. For there is one thing that all humans and the nature in which they live have in common: without water, there will be no life. The longer we squander and pollute water, the more radical the consequences will be. A change in thinking could actually happen quite quickly: often it is just a question of water management. Small changes can make a huge difference.

topos: If a change of course, a change of thinking could happen so easily – what keeps us from following that course?

WAGNER: Most of us are focused on the wrong things. With the vast majority of projects, it is economic interests and our own laziness that have priority. In my opinion, we humans are extremely resistant to progressive change when it comes to the intelligent use of our resources.

LITERATURE

AUTHOR: Florian Wagner
TITLE: African Waters (only available in German)
PUBLISHER: Terra Mater Books



AFRICAN WATERS

For more information on the project please go to:

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Aquatic Kingdom

The Iberá Wetlands in Argentina, one of the largest freshwater reservoirs on the planet, are home to a fantastic amount of biodiversity. They have become a key natural site behind the development of small local communities, in close association with private and governmental conservation efforts and actions. A provincial reserve, provincial park and now one of the world's newest national parks increasingly incorporating new land, the Iberá Wetlands are a precious ecosystem shaped by water.

JIMENA MARTIGNONI

The large surfaces of waters, the different shapes of green and the inundated land create an aquatic universe that is home to myriads of wildlife species.

Photo: Florian Von der Fecht

β

Water

The Iberá macro-system offers a diverse mosaic, which means not only a great deal of biodiversity but also a wide range of scenic conditions and poetic visuals.

With a total of 482,000 hectares covered by aquatic vegetation, the Iberá Provincial Park is located inside the Iberá Nature Reserve.

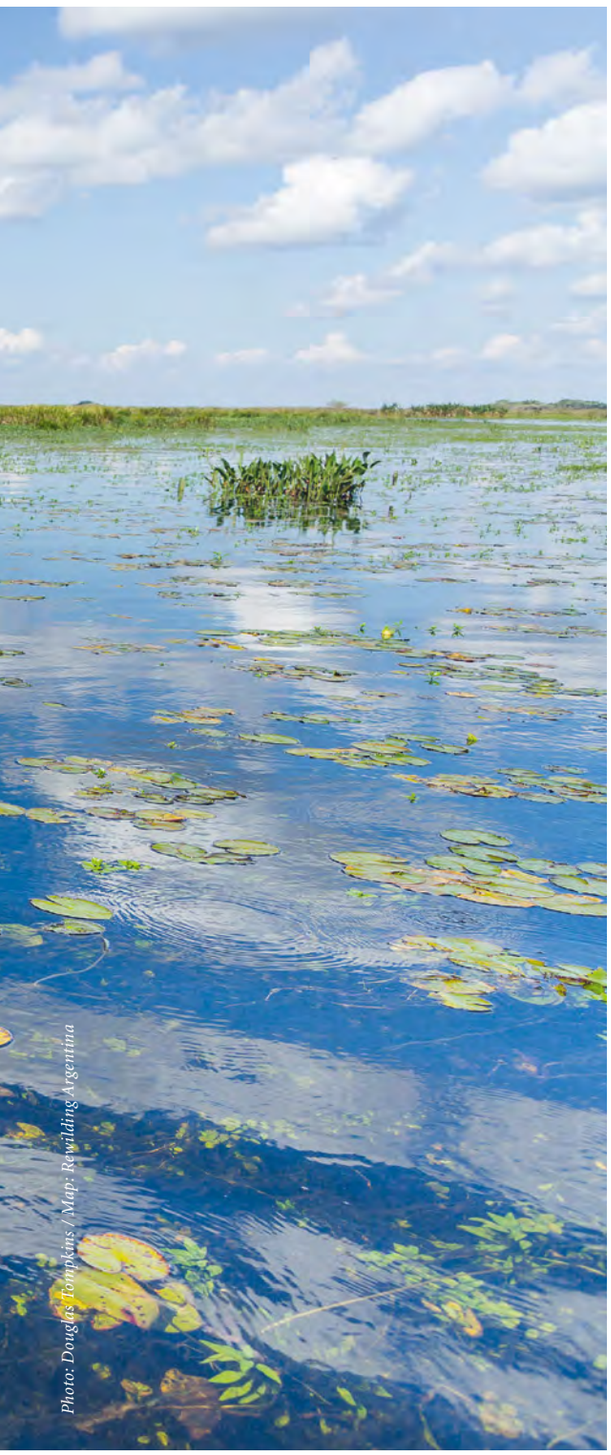
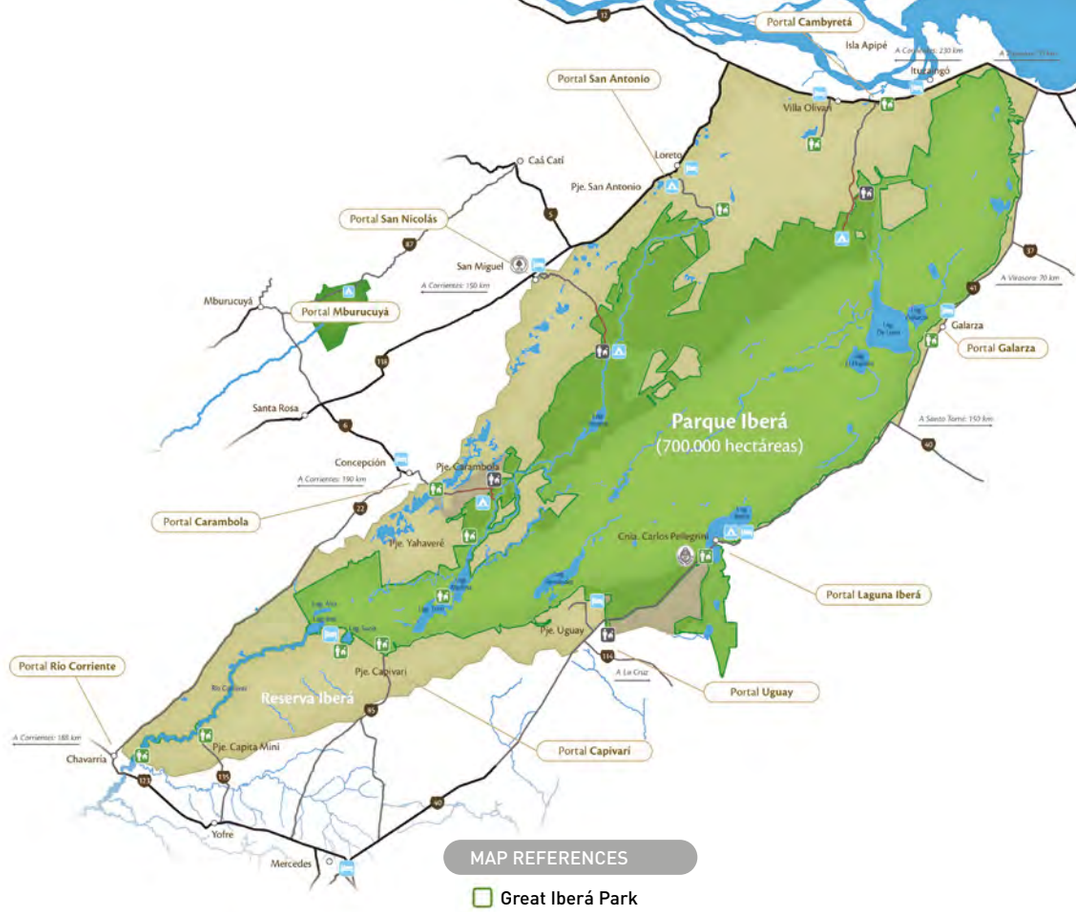


Photo: Douglas Tompkins / Map: Rewilding Argentina

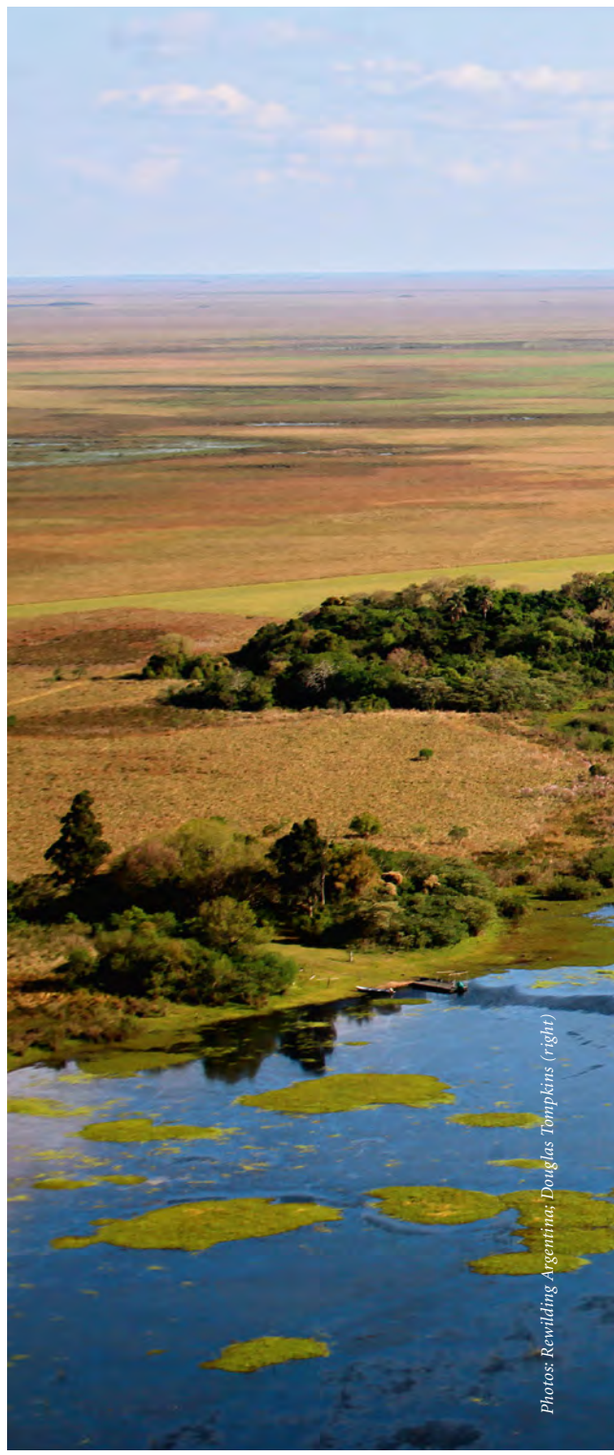


Esteros del Iberá or the Iberá Wetlands are a 13,000 km^2 macro system of swamps, marshes and lagoons located in the northeastern Argentinian province of Corrientes, which shares international land borders with Paraguay and Brazil. It is considered one of the largest freshwater reservoirs in the world and is part of the Guaraní Aquifer System, the third largest groundwater reservoir in the world (1.2 million km^2) and one of the few transboundary aquifers management of which is regulated by an international treaty: the Guaraní Aquifer Agreement, or GAA, signed in 2010 and later ratified by Argentina, Brazil, Paraguay and Uruguay.

Just pure water

The vast expanse of aquatic landscapes, plus the wide variety of grasslands and forests that also make up Iberá, are home to over 4,000 animal and plant species; bursting with life and at the same time offering urban dwellers profound silence, the Iberá Wetlands are the most perfect example of the precious, intriguing and irreplaceable presence of water on earth.

Thousands of years ago, the Paraná River, the second largest in South America after the Amazon, flowed freely and fiercely through the plains of what is today the northeastern region of Argentina, eroding the soil and shaping zigzagging channels and deep lowlands. The very humid climate of this region, plus its saturation-excess runoff, flat topography and consequent insufficient natural drainage, have all determined the gradual development of the Iberá Wetlands. These act now as a huge natural dam, catching the rain in the old river bed and filtering water into one of the largest groundwater reservoirs on the planet. This natural water system remains mostly isolated and far away from urban communities in Argentina, helping to maintain its uncommonly pristine condition and safeguard a diverse complex of flora and fauna. The distribution of vegetation is a result of many factors, the most important of which is the hydrologic pattern, determined by the depth, timing, and duration of inundation (flooding) as well as the quality of the source water.



Photos: Rewilding Argentina; Douglas Tompkins (right)

From a landscape-type perspective, the Iberá macro-system offers a very diverse mosaic, which means not only a great deal of biodiversity but also a wide range of scenic conditions and poetic visuals. The established landscapes are: Lagoons and floating islands, glens and swamps, grasslands or malezales, palm groves (yatay and caranday species) and patches of humid forests and savannas. Every one of these ecosystems, individually and also as a result of the essential interaction between each other, serve as important habitats for a number of endemic and protected species. Wading birds of all sizes, small birds, caimans and capybaras congregate at central water locations when the lagoon's levels are low; marsh deer and pampas deer walk freely at the edges of the roads; greater rheas, anteaters and native foxes can be seen in the open. Although they are sometimes cautious and elusive, they are never far away.

Water is in every case the natural element which binds these species together and the one natural component the presence and magnitude of which has determined the diverse and special living conditions in Iberá.

The very essence of Iberá

The entire Iberá system, the size of which is over 14 percent of the province's total area, was declared a Provincial Reserve in 1983 and is comprised of extensive marshes and estuaries, streams and channels and over 50 lagoons. The two largest lagoons are La Luna (7,800 hectares) and Iberá (5,300 hectares), but the latter has become the symbol of the wetlands and is the most visited by nature lovers, birdwatchers, conservationists and adventurous tourists. In 2009 a provincial decree established the Iberá Provincial Park, which covers 550,000 hectares. In 2018, as a final step in a long-term process, the Conservation Land Trust (CLT; now the Rewilding Argentina Foundation) donated 150,000 hectares for the creation of the Iberá National Park. Altogether, the 700,000 hectares constitute the Great Iberá Park. CLT's donation was partitioned into four stages, starting in November 2016 and ending in November 2019. In December 2018, Argentina's Congress finally passed legislation approving the official creation of the national park, which is now one of the three largest in Argentina and one of the newest worldwide.

This long process of park creation and of making Esteros del Iberá a model of conservation began much earlier, however: In 1997 the trust purchased Estancia San Alonso, a cattle ranch in the middle of the wetlands, which was part of the land adjacent to the existing Provincial Reserve. With the aforementioned 150,000 hectares in the Iberá watershed, CLT was soon able to commit itself to the conservation of wetlands and the restoration of grassland in the area. Furthermore, the trust implemented an ambitious rewilding program to

The pampas deer is one of the native species which was reintroduced in the area through the Rewilding Program.

Iberá Wetlands is a 13,000 km^2 macro system of swamps, marshes and lagoons.

More than 350 different bird species live in the Iberá Wetlands. Birdwatching is one of the main activities in the entire protected area.

Photo: Douglas Tompkins

protect and bring back threatened species such as the giant otter, giant anteater, pampas deer and the majestic jaguar, the largest feline in the Americas. The preservation of the essential and undeniable value of water in Iberá is intimately linked and justified in the appreciation of the local fauna and flora; in pristine areas, wildlife protection appears as one of the most relevant components of CLT's conservation actions. In turn, the economic development of the small and scattered local rural communities around the Iberá Wetlands has been another key task of the project. The current access portals to the lagoons are a few small towns (between 1,000 and 5,000 inhabitants each) the main activity of which is nature tourism. Focusing on a well-balanced human-nature relationship and fostering the conservation of ecosystems, nature tourism is a recent alternative type of tourist activity that seeks to benefit conservation and relies on the capacity of tourists to spread an awareness of environmental issues when they return home.

As a consequence of the gradual economic growth of these small local communities, the fast growth of the nature tourism and, at the same time, the reintroduction of endangered species as well as the preservation of landscapes CLT, having changed its name to Rewilding Argentina in December 2019, and the local governments started to work on the Production of Nature concept: The production of nature as the region's main asset and source of local development.

Bright waters for bright ideas in urban areas

Iberá is a term created by the Guaraní, the original inhabitants of this region of South America. It means "bright waters" and it is this quality of clear, pristine, life-protecting and light-reflecting water that remains the most essential and sensitive aspect of this ecosystem and amalgamation of landscapes.

Also, the fundamental and yet fascinating quality of the "system" itself: water areas, water courses and inundated land; extensive carpets of aquatic plants which become natural floating structures; grasslands and forest islets; landscapes of greenish, yellowish and brownish hues, a larger system of water found underground in forgotten cracks and shapeless spaces; home to wildlife, exuding ever more life. A precise natural organization, where every part is critical and where the interconnection and interdependence between the parts create a mechanism or network.

This impeccable mechanism, or at least the close and kind interrelationship between the parts, when combined producing something of greater value, is what human-made water systems in urban contexts have the chance to recreate. The need for a well-balanced, responsible and sensitive combination and organization of the parts is the lesson we can learn from natural systems such as the Iberá Wetlands.

CLT / REWILDING ARGENTINA

... is a private foundation created in 1992 by American environmentalist Douglas Tompkins (1943-2015) in order to start supporting land conservation projects in Argentina and Chile. The initiative was carried out by him and his wife, Kristine McDivitt Tompkins, who was designated UN Environment Patron of Protected Areas in May 2018. In Argentina and Chile, they have established thirteen parks in the past two decades on five million hectares of land, more than any other private individuals to date. In December 2019 CLT Argentina changed its name to Rewilding Argentina. For further information on the private foundation please go to: *www.proyectoibera.org/en/english/index.htm* and *www.unenvironment.org/people/kristine-tompkins*

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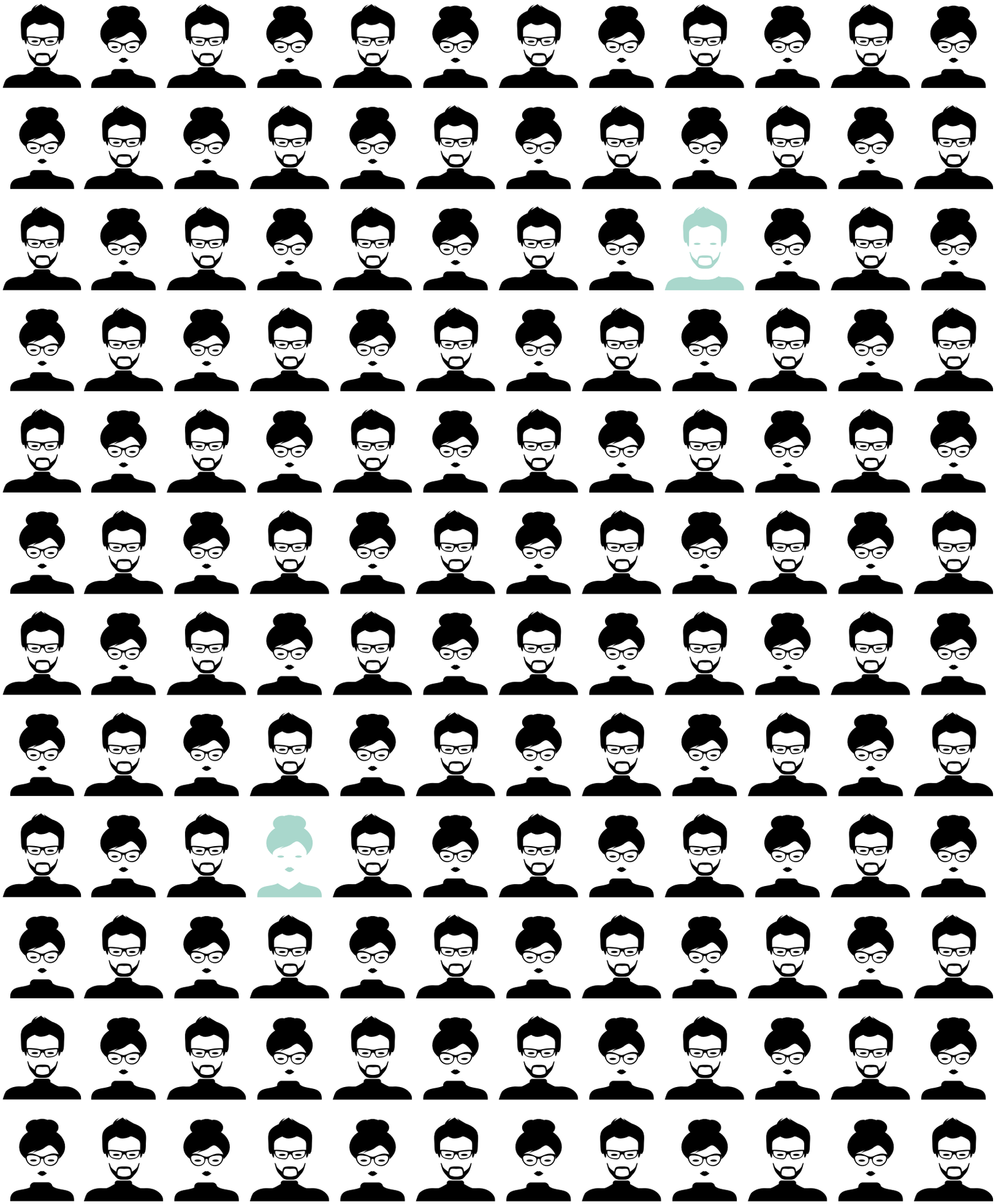
NEW MONDAY



Water is life, but too much or not enough of it poses risks to the way humans inhabit their environment. Unsurprisingly, the myth of the deluge has inspired imagination since the dawn of time. Its prophets and heroes – Noah, Utnapishtim, Deucalion – are testament to the power these myths still hold. In modern times, Science Fiction offers pathways to exploring worlds submerged by apocalyptic floods or buried beneath ice. They propose powerful scenarios for stories in which the catastrophic abundance or dearth of water determines how humans interact with their surroundings. They echo real-life challenges of sea level rise or increasingly frequent and intense flood or drought. Cultures complicit in such environmental changes are required to develop adequate responses, and the realms of Science Fiction can depict them in poignant ways.

Dune – desert planet – Arrakis

What if a planet possesses hardly any water at all, and how would this contour its political ecology? In the epic Dune series of novels created by Frank Herbert, the planet Arrakis – enshrouded entirely by arid, desert landscapes – is in the center of action that spans an entire galaxy. Considered a backwater planet in cultural terms, it is of paramount importance from the vantage point of galactic policy. Arrakis, or Dune, is the only known planet to harbor the most important substance of the universe: the spice melange. This exceedingly rare commodity can prolong life, trigger physical mutation, and heighten mental awareness beyond mortal ken. Spice is literally what drives the Dune cosmos and its political structure. Frank Herbert weaves a truly cosmic tapestry in illustrating the multi-planet cultural and economic context of his galaxy-spanning saga, with plenty of attention to the details. Initially published as a serial story in the SF magazine *Analog*, Dune was rejected by publishers before winning awards and conquering hearts and minds of readers and becoming one of the best selling SF novels of all time(s). Various film versions succeeded in failure or failed to succeed, while a new iteration by stylist supreme Denis Villeneuve awaits its cinematic release. Despite or because of the films, one reason for Dune's popularity is how convincingly Herbert orchestrates the story within its political and ecological framework. Tens of thousands of years in the future, faster-than-light travel has long since been established. There are feudal Great Houses that battle each other according to centuries-old codes of honor. There is the Emperor, himself member of a Great House that occupies the imperial throne. And all of them are ensnared in a deadly struggle for power. Their strife structurally reflects their access to resources – more or less openly – and aims towards a central one: the spice melange. Which points directly into Dune's ecological heart. The catch is: where there is spice, there is no water. Arrakis is a desert precisely because of the spice. The spice melange so important to galactic politics can only be found on Arrakis. To the Great Houses who occupy the planet, the absence of water makes ruling it arduous, more a form of punishment than a matter of distinction, and mining the spice is an extremely dangerous task. It is a byproduct of the fauna indigenous to the desert planet – the sandworms of Arrakis, the colossal Shai-Hulud. They seemingly "protect" the spice, attacking those who seek it.

Not only are the Great Houses unaware of the interdependencies between water, spice and sandworms. They are also blind to the indigenous culture – neither are they interested in it, nor do they value it. The giant sandworms are worshipped by the "Fremen", humans who migrated to Arrakis thousands of years earlier. Despised by imperial culture proper as boorish denizens of the sands, the Fremen have adapted to the desert by conserving water to the extreme. They wear stillsuits – sophisticated water reclamation systems that catch every last drop of water produced by human bodies through a system of pumps and filters driven by a heat exchange system and stored within catch pockets. Fremen inhale the dry desert air through a mouth filter and exhale into a nose tube to capture the last remaining iota of moisture. And they have begun to do so on a planet-wide scale. While water is rare on the surface, the Fremen collect it in vast amounts in their underground fortresses. Water is more valuable to them than spice – not only because it is so scarce, but because they have an ulterior purpose for it.

As a culture defined by deprivation, and despite their close to perfect adaptation to the near absence of water, they want to transform their desert world into a garden. They descended from enslaved people who were purposely exiled to Arrakis and its deadly environment. They eventually gained the knowledge required to effectively collect water in quantities needed to radically transform Arrakis. This desire for transformation can also be read as a trope to achieve control over their destiny. But by desiring to overcome the deadly struggle with the harsh environment, the Fremen are catapulted towards a different kind of struggle. They are caught in the galaxy-wide feudal conflict for the power to control the spice extraction. The heir to one of the Great Houses, Paul Atreides, promises to help the Fremen terraform Arrakis. In return they assist him in overthrowing the Emperor, and the key to doing so is stopping the flow of the spice. The Fremen are confronted with a dilemma: once they exchange environmental dependency on the desert for the political control over the spice, they can terraform their world into a garden they no longer need to adapt to. It is sadly ironic that the Fremen rebellion led by Paul Atreides leads to the demise of the Fremen way of life, as they overcome the exploitation of Arrakis by losing their rich culture of adaptation to their waterless homeworld. The Fremen replace an existing form of deprivation with a new one, they exchange water scarcity for a loss of cultural identity. Yet, the Fremen, themselves transformed by the lack of surface water into a tough, tribal society that obsesses over turning the desert into a garden, are described by Herbert this way because it serves his story. Dune is not a document of an actual culture, while readings of Dune reveal obvious references to bedouin culture, reminiscent of tales told by Lawrence of Arabia and others. Dune is "only" a story, albeit one that refracts the structure of reality in ways that are insightful.

Lessons from Dune

The scarcity of water as essence of life clearly poses risks to human survival. The dream to transform a desert into a green and blue paradise is an old one. Yet, transformation occurs within a broader political context of control over the environment and the exploitation of natural resources. The resultant contextual change potentially comes at a high price, and the underlying risks include loss of culture, identity, and adaptive skills to deal with water scarcity. At the same time, local ways of adaptation are possibly hidden to outsiders, while these skills offer sustainable pathways to living within a harsh environment. Yet the underlying dilemma is related to a perceptive mismatch within ascribing value: if you have sufficient water, you lose sight of how it is like to have none. If the desire to control and transform the environment is at the core of this dilemma, perhaps we need to give up this desire. In this regard it appears surprisingly prudent to question the logic of transformation. This shouldn't mean to give preference to scarcity or keep people in states of deprivation, but to value adaptive skills that may soon be required when water becomes scarce elsewhere. In this regard, it is telling that the Fremen form an alliance precisely with the heir to a Great House that aims to better understand the political ecology of Dune.

Illustration: Liis Roden

The political ecology of water shapes environments and human responses. Water also plays a prominent role in Science Fiction, either by its abundance or its absence. Floods destroy cultures and necessitate them to adapt, such as in Stephen Baxter's "Flood" or Kim Stanley Robinson's "New York 2140". The absence of water is a powerful backdrop for how people survive in a harsh environment in Frank Herbert's "Dune" novels. Patterns of power are contoured by water not only today, but also in futures and worlds far away.

TEXT: MARK KAMMERBAUER
LLUSTRATION: LIIS RODEN

Waterless World

Every planet has its beasts: the mysterious, deadly sandworms of Arrakis, the colossal Shai-Hulud.

A different Venice

The Northern Lagoon is part of the world-famous Venetian Lagoon in the Italian region of Veneto, but, in contrast to the well-known and exploited Central Lagoon, has managed to preserve its original landscape to a high degree. The future of this tranquil landscape, however, is anything but certain. Its further existence calls for landscape design interventions that consider the balance of three dialectical pairs: land & water, human & non-human and nature & artifice. A related comprehensive design strategy has to focus on the entire lagoon as one system where many environmental, morphological, and social singularities coexist.

ROBERTA ALBIERO, ALESSANDRO GABBIANELLI

Photo: Jacopo Berti

Fishery protection zone with fishing huts: The lagoon is inhabited by an enormously varied population of bird and fish species.

Barene or salt marshes are a unique habitat for a wealth of animal species. They are among the most characteristic morphological elements of the lagoon.

Photo: Roberta Albiero

On 12 November 2019 the acqua alta (high water) in Venice reached 187 cm above sea level, just slightly below the tragic 194 cm peak of 4 November 1966. These exceptional tides, which are more and more frequent, not only put Venice at risk, but also endanger the entire lagoon: An area of 55 hectares of a complex wetland system. The Venetian Lagoon is a single system geographically composed of three related parts that have different environmental and landscape characteristics: the Southern Lagoon, which is the most compromised; the Central Lagoon, characterised by the presence of the island of Venice; and the Northern Lagoon – the subject of this essay – the landscape which is still preserved to a great degree. The successive transformative processes set in motion by nature and humans over the millennia have generated a dynamic and ever-changing equilibrium that is necessary for the survival of this extraordinary environment.

Complexity and contradictions in the Venetian Lagoon

On a short-term basis, the morphological plasticity of the Venetian Lagoon depends on astronomical and meteorological tides. In the long run, it is due to subsidence, eustasy, erosion, and finally, to the actions of humans who have dug canals, diverted river courses and created containment works, fillings, and barriers to make the environment habitable and preserve its hydraulic functionality. In ancient times such actions were based on empathic relations between humans and nature. Yet, today this delicate balance has once and for all been broken. Numerous interventions have contributed to this situation, starting from the advent of the Napoleonic age, and later, from the beginning of the last century, with the construction of the petrochemical complex of Porto Marghera (1917), the Malamocco-Marghera canal, sadly known as Canale dei Petroli (petroleum) (1964-68), the Marco Polo Airport (1961), and most recently the MO.S.E. project (Experimental Electromechanical Module), which aims to prevent flooding through the installation of 78 mobile gates at three inlets – Lido, Malamocco and Chioggia – that will separate the Venetian Lagoon from the Adriatic Sea. Today, it is still under construction after more than twenty years of scandals and controversy. Increased tourism and the presence of cruise ships in the historic centre of Venice have caused an exponential increase in wave motion, erosion, and the degradation of the historical heritage. The consequence is that the profound relationship between Venice and its lagoon is now at risk. This means that finding a design approach for the preservation and development of the Northern Lagoon could also create a vision for the entire Venetian Lagoon.

The particularity of the Northern Lagoon

The Venice of the Northern Lagoon is "another Venice", and not compromised by the excesses of media and tourist exploitation. Consisting of small islands, ruins, archaeological remains, fishing huts, swamps, canals, salt marshes (barene), veils, and tidal creeks (ghebi), the lagoon is inhabited by an enormously varied population of bird and fish species that has adapted to different habitats that still host small communities. Examples of these are the islands of Sant'Erasmo and Vignole, where the ancient activities of agriculture and fishing are still performed. This alternative Venice allows visitors to experience cyclical time and slow movement in an atmosphere of suspension and immersion in the reflections, ripples and silence of the original landscape. The contrast to current conditions found in the swallowed up, consumed, desecrated, and degraded historic centre, rendered uninhabitable by unsustainable tourism, is evident.

The Northern Lagoon is part of the Natura 2000 Network and has been identified as a Site of Community Importance (SCI). The area presents a wealth of biodiversity that affects both typ-

The abandoned island of San Nicolò della Cavana, today known as Madonna del Monte, located between the island of San Giacomo in Paludo and Mazzorbo.

Photo: Jacopo Berti

ical wetland plant species and animals belonging to the marine and terrestrial environment. In 2014 the Municipality of Venice approved with an official act (Deliberazione di Giunta) the Plan for Land Use and Planning (Piano di Assetto del Territorio, PAT) that established the North Lagoon Park. However, after only two years the current municipal administration abrogated the plan on the grounds of excessive costs and bureaucracy, stopping an important path to preservation. The blind political management implemented in the historic city raises urgent questions about the future of the precarious landscape of the Northern Lagoon.

Venice before Venice: Archaeology for the future

The Northern Lagoon lives in a diachronic and synchronic temporal dimension, a plurality of times that oscillate between the extremely dilated geographical one of geomorphological transformations and the daily tides that modify its morphology. Then there is the time of the changing seasons, marked by migration of birds and fish, and the time of memory and the traces of past events – hidden traces under the water that slowly obliterate the enigmas of an ancient past – remnants of "Venice before Venice" (Dorigo et al. 2002).

The Northern Lagoon, always considered as a mere backdrop to the massive profile of the historic city, is in fact the very site of the origins of Venice, as hypothesised and demonstrated by Wladimiro Dorigo and Ernesto Canal. Populated since ancient times, the Northern Lagoon had always been a production and trade centre, especially due to the presence of the Roman port of Altino, later extended to Torcello. Agriculture, fishing, hunting, handicrafts, glass production, building materials and salt were the basis of an economy that alternated with the changing water cycles between periods of greater and lesser populations.

Submerged in the water of the lagoon, effaced by a process of erosion that has cancelled, in many cases forever, any possibility of their ever reappearing, these traces of the past are being documented and shown in the archaeological museums of Altino and Torcello, where excavations are underway. Some artefacts, such as parts of roads and embankments, remains of buildings, glass fragments, mosaics, and horse skeletons, document the intense activity of the population during Roman times. Historical sources (Livy, Strabo and others) tell of the numerous hydraulic works which were carried out, such as the creation of canals and fossae transversum that made passage within the lagoon possible and ensured movement and trade between the major centres of Patavium, Altinus, and Aquileia. Over the centuries human intervention in the Northern Lagoon became more and more incisive, culminating in the era of the Serenissima Republic of Venice with the diversion of the mouth of the Sile River. These hydraulic works, even within the limited means of the time, were always intended as a way to safeguard the wetland system and its hydrodynamics. This submerged heritage has helped to rewrite the history of Venice's origins, presenting us a Northern Lagoon full of life that was in harmony with the cyclicality of time and water. In order to intervene in this particular environment's future today it is necessary to return to an empathetic way of thinking aimed at bringing more holistic dynamics into play. So, what direction should the design of the Northern Lagoon's landscape take? What would the best intervention strategies be for creating conscious fruition that would raise awareness and inspire respect for the lagoon's landscape?

Implementing inventive conservation

Constructing a vision of the Northern Lagoon requires taking a look at the past, the historical stratification in the metamorphosis of the territory, and the natural, architectural, and social

Scenic atmosphere: The Northern Lagoon is part of the Natura 2000 Network and has been identified as a Site of Community Importance (SCI).

heritage. At the same time, it must address the future by imagining new processes of transformation that can interpret the changing environmental factors, territorial morphologies and delicate social arrangements so that the Northern Lagoon can once again become a living wetland. It is about implementing what Pierre Donadieu calls "Inventive conservation: A way of thinking about the planning of space that allows for the conservation of concrete elements of the landscape for historical, ecological, economic, symbolic and aesthetic reasons as well as the creation of innovative forms corresponding to new or old functions and usages of territory" (Donadieu, 2002:85). The survival of the Northern Lagoon needs landscape design that considers coexistence and balance in the light of three dialectical pairs: land/water, human/non-human and nature/artifice. During the long historical transformation process of the complex Venetian Lagoon, the importance of the equilibrium between land and water was fundamental. The problem of excessive erosion and the relative decrease in the extension and number of the salt marshes together with the lowering of the seabed requires that landscape projects act on a territorial scale (D'Alpaos, 2010) for the entire terrestrial hydrographic system, consisting largely of the Dese River, the Sile River, and the numerous secondary canals that flow in and around the Northern Lagoon. Landscape planning must take decisive action regarding the quality and flow of river water, the environmental quality of the riverbeds and, above all, the contribution of sediment. All landscape design must be accompanied by more precise interventions to encourage the formation of artificial salt marshes, bearing in mind the dynamics that regulate the flow of sediment, as well as interventions for the maintenance of existing barene. In all this the vegetation plays a paramount role; the presence of halophilic plant species and reeds constitutes an effective system in producing soil that, together with protective structures made of wood, will hinder erosion processes in the salt marshes (Bonometto, 2014).

Protecting heritage by participation and design

The exceptional characteristic of the Northern Lagoon is its high-level biodiversity. The Convention on Biological Diversity recognises that the values of biological diversity and its components are "social, economic, scientific, educational, cultural, recreational and aesthetic" (UN 1992, p. 1). Therefore, the survival of the lagoon is based on the coexistence of both human and non-human factors. This should be assumed in the project as an ecumene, that is "the sometimes ecological, technical, and symbolic relationship of humanity with the earth's surface" (Berque, 2019:54). In taking advantage of the particular environmental characteristics of the site, the inhabitants of the smaller islands have practised trade, shipbuilding, fishing, fish farming, and agriculture, all of which are still carried out today by young local entrepreneurs. The project must consider the productive potential of the lagoon islands and the role of its inhabitants in the construction of the landscape (Bombieri, Lancerini, 2009). Only a living and active society that pays attention to the cohabitation of the animal and plant kingdom can preserve the delicate metabolism of the lagoon and keep alive the anthropological origins of the place, with the promotion of a sustainable economy directed to the protection of the landscape. Today agricultural activities can interface with cultural activities linked to the discovery of archaeological, architectural and environmental heritage by promoting knowledge through cultural tourism.

Exploring archaeological sites on the islands of San Lorenzo di Ammiana or Lazzaretto Nuovo, visiting ecclesiastical architecture in Torcello, Murano, San Francesco del Deserto, and discovering the lagoon's vast biodiversity are all activities that promote the awareness of this fascinat-

Photo: Jacopo Berti

Venice Lagoon from above in the North the island of Burano.

ing landscape. The Northern Lagoon should therefore be understood as a broad scenario in which to seek dynamic balance in social, productive, and natural processes. Over time these lead to a landscape heritage that must be protected, studied, implemented, and experienced through projects that will actively hold together both nature and artifice, just as has been the case since Roman times. Creating adaptable and flexible architectural devices that can function as useful systems for the control of environmental dynamics, the enjoyment of the lagoon and exploration of nature should be taken into consideration. The design of temporary pathways connecting emerging land of particular interest, floating docks and ephemeral architecture for fishing that refer to the vernacular landscape. There should be structures for the protection, enjoyment and evocation of archaeological sites, removable or floating hides for bird watching and the monitoring of birdlife, and experimental systems adaptable to sustainable agriculture. These must interpret and enhance the resilient character of the wetland while amplifying its uses. In this context it is important to activate a strategy that holds together knowledge, fruition and experience of the lagoon landscape not only through the contemplative aesthetic approach of an "observer", but also and above all through an operative "participant" approach (Cosgrove, 1998). The participation of inhabitants as well as researchers and tourists with the support of experts and craftsmen would create a new and alternative way of experiencing the landscape by actually making it. Such a conscious, operative and participative approach proposed for the transformation of the Northern Lagoon could be extended to the entire Venetian Lagoon, as this fragile territory needs an interdisciplinary, cross-sector approach in order to grasp the complex dynamics and fundamental relationships between natural modifications, climatic events, and anthropic actions. The landscape design strategy has to consider the whole lagoon as a unique, single, homeostatic system where many environmental, morphological and social singularities coexist. These must be taken into account to guarantee the survival of both the entire lagoon and Venice, because Venice is first and foremost its lagoon.

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The Piros-Parapiros dam is located in the northwestern part of the Peloponnese peninsula in the hinterland of the Patras region.

Landscaping a stony Intruder

AIKATERINI GKOLTSIOU

Photo: Aikaterini Gkoltsiou

Dams are either regarded as necessary water resource management and infrastructure works or as intruders into the landscape with severe negative environmental, socioeconomic and aesthetic impacts. Landscape architects have been concerned with the dual character and resulting dilemmas of these structures for a long time. They consider it their task to mitigate the impacts of dam construction and to find ways of landscape restoration – not in the manner of landscape beautification but of ecological and cultural healing. Piros Dam in Greece, presented here through a case study, is an instructive example for reviewing the essential role of landscape architects in the field of hydraulic structures.

Since ancient times, man has tried to control and collect running water by building dams across riverbeds, thereby creating reservoirs and artificial lakes the water of which could then be used for supply and irrigation. Among the oldest dams are the Jawa dam in Jordan (4th millennium BC), the Sadd el-Kafara ("Dam of the Infidels") on Wadi al-Garawi in Egypt (2600–2500 BC), the dam on the Orontes River in Syria (1300 BC) and the dam in ancient Alyzia in Greece, which still remains as a historic monument (1st century BC). The desire to harness water to perform work is likewise very old. In ancient Greece, water wheels were used for grinding wheat into flour. The evolution of the modern hydropower turbine, which began in the mid-18th century, turned the generation of electricity into a key function of building dams.[1] During the last century, a rapid increase in large dam building occurred and by the end of the 20th century, there were over 45 000 large dams in almost 140 countries.[2] Viewed in relation to the landscape in which they are situated, dams can be categorized somewhere between the pastoral and the monumental. Beaver-built dams represent a special and distinctive form of a pastoral dam. They can stand as true monuments if not to human ingenuity, then to a more primal creative energy.[3] While human engineers sometimes adopt beavers as their mascot or icon, their work so far rarely achieves the balance with nature that distinguishes the constructions of these semi-aquatic rodents. Modern dam structures are often large-scale projects that come with severe interventions into the existing landscape. They may literally transform a part of the face of the earth, producing long-term consequences not only for the natural environment but also for the people who live in it, as well as their lifestyles and economic activities. The task of offsetting, healing or mitigating the detrimental aspects of large hydraulic structures falls to landscape architects in most cases. They are called upon to develop landscaping designs that consider both ecological protection and human needs, the latter ranging from technical function to aesthetic pleasure. Given these countervailing goals, how can landscape architects successfully contribute to the landscape restoration accompanying hydraulic engineering projects and encourage the harmonious integration of dams into the landscape? In other words, what are the specific challenges they face as they work towards an equilibrium between man and nature?

The impacts of dam building

The environmental impacts of dams affect the biological, chemical and physical properties of rivers and riparian environments. The American non-government organization International Rivers, which addresses both environmental and human rights issues connected to human transformations of rivers, lists the following adverse impacts: Upstream of the dam, the most significant impact is the transformation from a free-flowing river ecosystem to an artificial slack-water reservoir habitat. The emergence of a reservoir that wasn't there before, produces changes in temperature, chemical composition, dissolved oxygen levels and physical properties that are not suitable for existing riparian aquatic plants and animals.[4] Frequently, the blockage of fish migrations that dams exert leads to habitat separation. Downstream of the dam, the alteration of the river's flow as well as sediment trapping and transport often alter aquatic and riparian life, which can unravel the ecological web of the entire river system.[5] Riverbed erosion will occur as the river seeks to recapture its lost sediments from the banks. Groundwater tables along the river become lower, with severe impacts for plant roots and human communities. Lastly, severe impacts appear in the broader biosphere, since some reservoirs, especially those in the tropics, become significant contributors to greenhouse gas emissions.

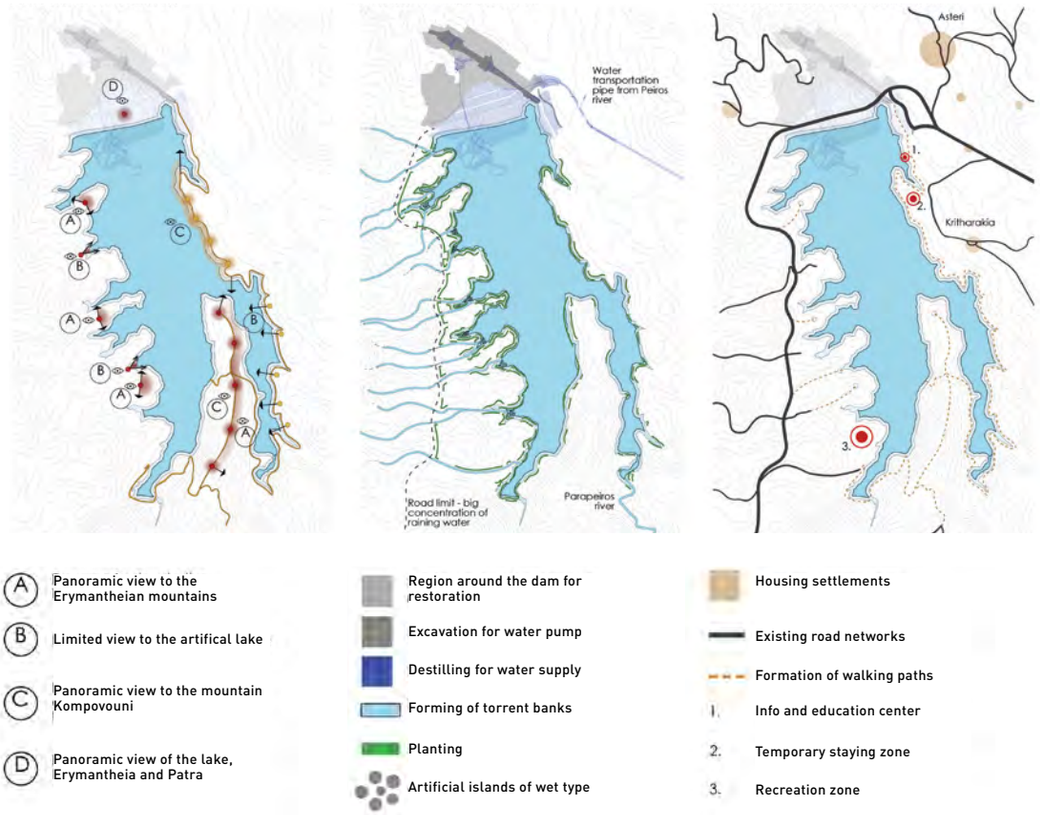
Apart from the environmental impacts, dams may also unfavorably alter a landscape's aesthetic appearance.[6] Often the "new" landscape takes on a "haunted" look, displaying a stark environment deprived of human presence. Thirdly, hydraulic structures often lead to severe socio-economic impacts that are detrimental. People are exiled from their lands, losing not only their homes but potentially also access to clean water, food sources and other natural resources that were previously provided by the areas now covered by the dammed-up water.[7] In the tropics especially, artificial lakes and large-scale irrigation can lead to the emergence of new, and the spread of existing, diseases due to a massive increase of harmful insects. Another socio-economic issue tending to arise in developing countries where large hydroelectric facilities have been built is a problematic dependency on hydroelectricity. Contrary to the widespread perception that the vast amounts of energy provided by a large hydroelectric power station will solve energy supply issues for good, the dependence on one central energy source actually produces new severe problems at other levels. As International Rivers points out: "Numerous hydro-dependent countries have suffered drought-induced blackouts and energy rationing in recent years." A diverse power generation infrastructure is clearly preferable to a centralized power supply. A further interesting socio-economic aspect is the largely unknown fact that "dams consistently cost more and take longer to build than projected."[8] Cost overruns are especially the case with large structures. Furthermore, the overall costs of large dam projects are often out of proportion with the economic development benefits they produce.

Landscape planning is focused on restoring the lake's landscape and ecosystem, promoting the protection of the natural ecosystems and integrating the area into the wider network of natural and cultural heritage sites.

SUGGESTED SPOTS FOR OBSERVATION AND BIRDWATCHING

DIAGRAM OF INTERVENTIONS IN THE NATURAL LANDSCAPE

DIAGRAM OF SETTLEMENTS, ROAD NETWORKS & PROPOSED PROGRAMS



Increased awareness of detrimental environmental, socio-economic and aesthetic impacts of human-engineered river transformations, particularly in the case of large dams, have mobilized protest movements and citizens' initiatives in many places. Dam refugees and other people adversely affected by these constructions count on landscape architects as one group of specialists that can help them if not reverse, at least mitigate foreseeable as well as already existing problems.

Resilient design and ecological engineering

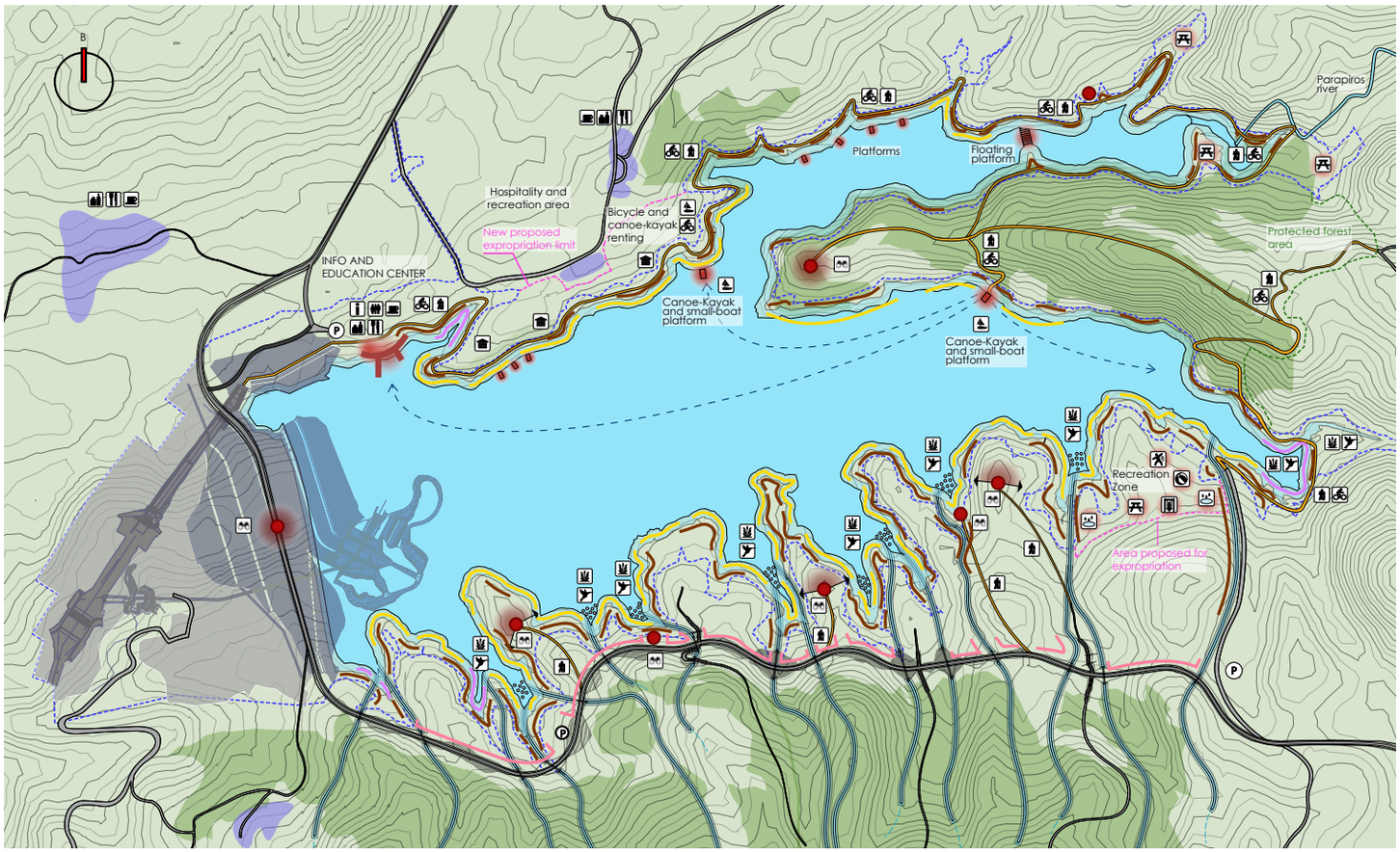
The challenge for landscape architects who are involved in dam projects, whether as part of an interdisciplinary team from the start or more independently after finalization of engineering and architectural plans, is to ensure that (1) the detrimental effects to the environment remain limited as much as possible and (2) the benefits of the new facility and the emerging new landscape are more equitably distributed to various sectors of society. More immediately, the role of landscape architecture is to restore the defaced area as much as possible and enhance the new landscape that has arisen as a result of the human intervention. This does not mean landscape beautification, as many outside the discipline believe, but instead establishing a strategic and holistic conservation approach, taking into account the societal needs, diverse landscape factors – ecological, perceptual and socio-economic – as well as the technical requirements of the hydraulic project.[9]

Landscape planning in hydraulic engineering contexts means developing an adaptive strategy that takes into account the needs of ecology as well as human needs, carefully distinguishing between situations where these needs are opposed and those where they can be reconciled. Given that a wetland system is strong if rooted in robust and resilient nature, the goal should thus be to set up a flexible water management for the region and determine the best locations for effective restoration actions within the water basin. While the preservation and restoration of ecosystems is among landscape architects' primary concerns, the challenge is to develop a design that blends natural systems, local culture, and recreation, simultaneously promoting the site's distinctive aesthetic and taking into consideration freshwater and security issues. On one hand, such an approach will seek to blend landscape design with ecological engineering.[10] In fact, bioengineering restoration techniques, regarding the protection of the lake shore by wave absorption, water purification, enhancement of habitat for wild life, and landscape improvement, should be used as much as possible. As for the socio-economic aspects on the other hand, the goal must be to initiate the coordination and balancing of parallel as well as opposed interests and contribute to a peaceful collaboration among the stakeholders involved (e.g. governmental bodies, local citizen organizations, environmentalists, business). It will be among the landscape architects' task to ensure that this process keeps the well-being of the natural ecosystems, of rivers and wetlands, at heart.

Case Study: the Piros-Parapiros dam in Greece

The design proposal for the Piros-Parapiros dam, located in the northwestern part of the Peloponnese peninsula in the hinterland of the Patras region, won the first prize of the planning competition launched by the Prefecture of Western Greece and was awarded a recognition in the category of non-implemented design projects by the Serbian Association of Landscape Architects (SALA/UPAS) at the 8th International Landscape Architecture Exhibition 2019. The proposal demonstrates how essential the role of landscape architecture is for the successful implementation of hydraulic structures. The goal was to minimize and mitigate immediate as well as longer-term detrimental impacts resulting from the construction of the dam and the subsequent emergence of an

Illustration: Aikaterini Gkoltsiou and team



artificial lake of 1,63 km^2 surface area. With this goal in mind, the landscape analysis took into account three levels: ecological repercussions, socio-economic fall-out and changes to the perception of the landscape. The principal foreseeable issues were vegetation loss, invasion of new species of flora, removal of fauna species, abandoned villages and decline of the primary sector, disappearance of river landscape features, bank erosion and solid waste increase. In response to the results of the analysis, the landscape planning focused on restoring the lake's landscape and ecosystem, promoting the protection of the natural ecosystems and integration of the area into the wider network of natural and cultural heritage sites, as well as upgrading the landscape's resilience – adaptation to climate change and improvement water quality and quantity – in alignment with the guidelines of the European Water Directive. The planning ideas also included the integration of the study area into the wider development planning of the northern Peloponnese and its tourist and production networks, with the intention to provide synergies between the primary and tertiary sectors, as well as to strengthen the multi-functionality of the rural areas. To meet these goals, the site was organized spatially into three basic zones: the environmental protection zone, reserved exclusively for the protection of wild flora and fauna; the zone of anthropogenic interventions (the dam, existing settlements, etc.); and the recreation and entertainment zone (theme park, water sports, etc.). The design proposal made both natural wealth and cultural heritage legible through appropriate signage solutions, in order for biological and ecological information to be easy to discover and learn from by residents and visitors alike. The design objectives focused on the wetland's revitalization through bioengineering methods (fascines, brush layers, live plant materials, artificial floating islands), in order to protect existing habitats, counteract the problems of unstable water level and erosion, manage sludge and waste. Furthermore, the design included the creation of an ecotourism park with a variety of recreational and

Illustration: Aikaterini Gkolsiou and team

The design included the creation of an eco-tourism park with a variety of recreational and leisure activities.

leisure activities. An aesthetic valorization was achieved through a complex network of paths linking the dam, an environmental and visitors center, as well as birdwatching observatories. In order to offset negative socio-economic impacts, the design also included consideration of employment opportunities for local residents, in particular the operation and management of various eco-touristic activities. For this, the design proposal provided integration of a camping area, a children's park and facilities for water sports such as canoeing, kayaking, etc.

Holistic ecological design

While some impacts of large hydraulic structures are indeed irreversible, landscape architects, through their methods and tools, are particularly well-suited for understanding the complexity of trade-offs between the ecological benefits of restoration actions and competing human demands for goods and services to be derived from river transformations. As such, a holistic ecological design approach, based on a continuous process from landscape analysis to planning and design, will have the best potential to ensure that a given hydraulic project will harmoniously coexist with the new landscape and, more importantly, with ecologically healthy wetlands. This is why it is important to analyze the forms, functions and values of the newly created landscape and identify the constraints and opportunities of potential uses, so that new socio-economic dynamics and perspectives for the surrounding areas can be introduced and made to grow.[11] The goal, in the words of Ian McHarg, is to achieve a productive balance between the processes and values of nature[12] on one side and human actions on the other; such a balance will offer benefits to the ecosystems, to the human users as well as to the dam or other hydraulic engineering projects.

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CURATED PRODUCTS

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Products

Playgrounds – Important Places

The global effects of the Coronavirus have led to the closure of playgrounds just about everywhere. They are now slowly reopening in some places, and the great rush to use them shows how painfully they've been missed – by children and parents alike. The period of firm restrictions regarding access and contact have made it clear just how important and essential public playgrounds are. Apart from outdoor exercise, the lack of social interaction was especially difficult, not only for children. Of course, these deprivations also encouraged the discovery of creative games and activities at home, but particularly in dense cities, it's impossible to replace good, safe and challenging playgrounds and their equipment. We all look forward to climbing, sliding, swinging, jumping and romping around again, and we will undoubtedly learn to be aware of and appreciate some things more consciously than we have in the past.

Photos: Anton Donikov; Spiel-Bau GmbH

Climbing combination

With Layers, the Spiel-Bau GmbH from Brandenburg an der Havel has developed a climbing combination that joins together quality, high fun factor and durability. The result is a new design in which children are able to experience height at various levels and layers. There are no railings that block the view and the equipment has an airy look that allows it to simply blend into the landscape. Children and parents can feel safe all around: The tunnel's inconspicuous nets made of Hercules rope are almost invisible from a distance, but are nonetheless extremely stable, preventing any mishaps. Once reaching the top of the climbing tower, which is supported by sturdy stainless steel posts, excitement grows as children get ready for a rapid descent on the long tunnel slide.
www.spiel-bau.de

Bird's Nest

The Bird's Nest from HUCK Seiltechnik has an adventurous character – used as a swing, it is a popular piece of play equipment on any playground. On this piece of equipment, children play in a "nest" made of a close-meshed chain-link mat that is so tightly woven it's impossible for arms or legs to slip through it. The risk of injury is also minimised because users sit on the nest's smooth and gently rounded floor. Dirt and moisture do not adhere to the mat's material, leaving users' clothes clean and dry. There are numerous ways of using the Bird's Nest: Different colours for the nest's thick rope edging are available and the two alternative suspension systems can be wrapped in protective rubber tubing. Entire fantasy worlds can be created according to the different frames available, using the bird's nest in a tree or making a tower, using springs and in combination with various other types of rope and climbing elements.
www.huck-seiltechnik.de

Playful Art

Playgrounds and art can be combined wonderfully in public spaces, as is proven by the Berliner Seilfabrik's Cloverwood. The sculptural form with its gentle curves and the warm hues of its wood not only has an aesthetic effect, but also offers children an exciting place to climb and balance on and swing from. Its shape is remotely reminiscent of the drawings by M.C. Escher. When seen from above, the structure forms a four-leaf clover, the shape of which is also reflected in the aluminium fixtures used for the spacenet structures, which have been developed for this purpose. They are safe for children's hands and allow the spacenet's individual parts to be replaced with little effort. In addition, steel connections tightly bind the individual laminated larch beams, thus providing stability.
www.berliner-seilfabrik.com

Photos: Berliner Seilfabrik; HUCK Seiltechnik GmbH

Photo: PLAYPARC

Modular play equipment system

The new ETOLIS modular play equipment system by PLAYPARC was developed especially for the needs of 4 to 10-year-old children. The emphasis here was put on social aspects as well as on risk and communicative play, although sensomotor skills are also tested in playful ways. In order to give children room to be creative and develop their imagination, the design of a particular theme was deliberately avoided. The modular construction makes it possible to flexibly combine all of the play equipment system's components – a variety of climbing towers, walls, ropes and poles, balancing elements and slides. When selecting materials, the German manufacturer focused on high-quality materials such as larch wood, stainless steel, outdoor HPL (high-pressure laminate) and hot-dip galvanised steel. The company also offers a 10-year warranty on its products. The system is delivered as a kit, making assembly simple.

www.playparc.de

Cayman International School, Cayman Islands

In order to withstand Caribbean climatic conditions, all metal parts used in the outdoor play areas at the new Cayman International School had to be made of marine grade stainless steel.

In autumn of 2019, the Cayman International School opened a facility for young children on the Cayman Islands in the Caribbean. The Early Childhood School was deliberately built around the school's child-centred, playful educational philosophy. Every detail of this spacious new facility was designed with the intention of involving the school's youngest students. Each classroom is designed and furnished for a specific age group, and there are areas for learning, playing and resting. Such flexible learning spaces allow for tailor-made teaching to meet individual needs.

The core element of the outdoor area is the landscaped and fenced playground that has a tricycle path, small hills, Richter playground equipment and sand-covered areas. This outdoor space will give the children the opportunity to explore natural materials while they play and move around. Younger children will especially enjoy themselves here while sliding, role-playing in the big playhouse, using the painting walls or spinning around on the small carousel. In addition, the spring in the sand area enables children to have their first experience with water and sand, and they can play to their hearts' content. The young and old can sit together, play, laugh, chat or have a snack at the large round table with its eight stools. And the large climbing structure allows several children or teachers to climb and stay balanced at the same time.

The International School on the Cayman Islands wanted to have a challenging playground with high-quality equipment. They selected products made by Richter Spielgeräte GmbH, a company from Frasdorf in Upper Bavaria that has been designing and manufacturing play equipment for national and international playgrounds by hand for over 50 years. A special feature of this playground is that all the metal parts had to be made of marine grade stainless steel in order to withstand the island's climatic conditions. In addition, the landscape architect – Nicholas Forari Denney from Dart – working on the project installed a complete set of material samples on the roof of the facility several months in advance to see how the products would hold up to the bright sunlight and salty air.

www.richter-spielgeraete.de

Photos: ©Dart

Editor's Pick

The Sirius framework unit can be individually extended with newly developed add-on modules that can be attached to the basic climbing unit, making it the heart of a climbing landscape.

Heart of a Climbing Landscape

The curved truss tubes give the SIRIUS play element from smb Seilspielgeräte GmbH its characteristic shape. Six large curving tubes form open entrance areas, inviting users to climb onto the unit. The area net promotes a high degree of concentration when climbing due to its changing mesh sizes. A six-strand Hercules rope made of steel wires with a diameter of 18 millimetres and a high-quality polyamide or polyester yarn sheathing is used here. Aluminium ball knots connect the net's intersecting ropes. These are pressed together with a hydraulic tool and thus transfer the necessary rope forces. Users can move around the inner dome in an upright position, without having to leave the area net. A large seating membrane, located at the highest point of the area net, offers space for communication while providing expansive views, and also serves as a goal for climbers. In addition, six individual lounger nets built into the area net provide users with places to rest and offer them additional communication points.

The SIRIUS can be ordered in a variety of colours according to customer requirements. Various rope colours are available, as well as a range of RAL colours for the steel elements and aluminium ball joints. Additional add-on modules that fit the basic unit's characteristic arched shape can also be individually attached to it. Thus, numerous combinations are possible – especially in combination with other types of smb devices. The SIRIUS can, for example, become the heart of a climbing landscape by attaching low ropeway elements with different degrees of difficulty.

www.smb.berlin

Photo: smb Seilspielgeräte GmbH

BACKFLIP – *Rudolf Bednar Park, Vienna*

ROSA SCHABERL

When the Rudolf Bednar Park opened in 2008 its roughly 32,000 square metres made it the largest park Vienna had built since 1974. It was a prestige project for politicians and set a new benchmark for Viennese park design. The concept by Hager Partner AG, Zurich, which has not only stood the test of time, continues to demonstrate new qualities. A synthesis of functionality and foresight by the landscape architects, it is still held in high regard by both residents and the city.

"The Rudolf Bednar Park will be far from finished (...) when it opens. This moment is only the beginning: The park is just coming to life! The trees, hedges and shrubs are still small. They are now beginning to grow, and in time they will take their place in the neighbourhood with more and more self-confidence and independence". This is what landscape architects Guido Hager, Patrick Altermatt and Pascal Posset from Hager Partner AG in Zurich wrote about the (then) new Rudolf Bednar Park in Vienna in the foreword to their book under the same name (Niggli, 2008).

And yes, the plants have certainly grown since the park's opening – but it's not these plants that have established themselves confidently and independently, but rather the park itself as part of the new quarter at the former Nordbahnhof railway station. What's more, the basic design concept has made Rudolf Bednar Park the green identity of this new urban development and the epitome of the urban lifestyle of this quarter. This was not merely by chance, but intended by Hager Partner AG. When they won the non-open, single-phase design competition for the park in 2005, the residential and office buildings surrounding it hadn't been built yet. The approximately 3.2-hectare park was one of the first completed parts of the 75-hectare urban expansion, while the flats for the roughly 20,000 new residents won't be finished before 2025.

However, in order to provide the slowly increasing local population with an identity-forming open space as early as its opening in 2008, the landscape architects oriented themselves on the nearby Danube River and its former floodplains habitat. The main access and zoning of the activities, even the space-creating "veil of trees" – everything is connected to the

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Visualisation: Hager Partner AG

The orange steles were developed by Zurich-based Hager Partner AG especially for the Rudolf Bednar Park in Vienna. They mark activity zones and help to create identity.

river. The reed gardens in the water basins and the ash trees scattered in the "veil" are both reminiscent of the floodplain.

The distinctive orange steles developed especially for the park also help create a sense of identity. Seemingly distributed throughout the park at random, they stand out and are visible from afar. On closer inspection, it becomes clear that the steles mark activity zones and even function as play and sports equipment. They simultaneously serve as a characteristic feature and an invitation: for small children, near the residential buildings, for older people in the generational activity zone and for adolescents and adults who want to play sports near the school in the south. The steles even support the roof of the pergola in the centre of the park. The lawns on both sides of the pergola and along the main access paths are areas for general use. Although these spacious areas still have a very expansive feel to them, even though they are now surrounded by residential buildings up to 10 storeys in height, the neighbourhood gardens still provide peaceful places of retreat. Hager Partner AG also set new standards in Vienna with regard to their use of perennials and shrubs, and the original planting plan is still meticulously adhered to today. When individual plants die, they are replaced according to the plan, confirms the *Wiener Stadtgärten* (the city's parks authority).

It's a different situation concerning the veil of trees, however. New trees will be planted in the coming years, according to the head of the district, Uschi Lichtenegger. This is not because Hager Partner AG's concept is dysfunctional, but because climatic conditions have changed. The summers are getting hotter, and more shade is needed. It's not yet clear to what extent these replantings will follow the concept. Lichtenegger has also arranged for further adaptations: The areas for young children have been expanded, playground equipment has been replaced and the toilet facilities will also be rebuilt.

The park is so well received by the local population that more and more people are using it, and problems are arising. Even though the concept is very good, there still are challenges, and additional open spaces in the neighbourhood have been recommended for quite some time. In 2021 another 10 hectares are to be handed over to the city, and Rudolf Bednar Park will finally get some relief as a result of the so-called *Freie Mitte* project. This all shows just how functional and far-reaching the 2005 design was, and how popular it really is with the many different types of people who use it. This is a project worth writing a book about, so that it can be looked at in more detail. My recommendation is therefore to do both: buy the book and visit the park.

ESCAPE PLAN – *Delhi*

GEETA WAHI DUA

With its seven historic settlements developed successively over a span of almost twelve centuries, the city of Delhi has a multilayered history. The hills of Aravalli and the perennial river Yamuna are two prominent natural features of the city that have shaped the different cultures of these settlements, including the present-day capital. In the past decades, few landscape works have been conceptualised in this context. While imbibing the intrinsic natural character of the respective sites, these experiential public spaces have used implicit ideas based on philosophical thoughts and physical settings.

Pind Balluchi, Connaught Place

pindballuchi.com

Heritage Hotel, Haveli Dharampura, Delhi

havelidharampura.com

Masakali from the Hindi film Delhi 6 (2009), a popular song that captures the spirit of the old city of Delhi.

youtube.com/watch?v=SS3lIQdKP-A

GEETA WAHI DUA is a landscape architect based in New Delhi and is a co-founder and co-editor of *LA, the Journal of Landscape Architecture*, a quarterly publication that she, along with her partner, Brijender Singh Dua, launched in 2001. Her interest in the subject of landscape architecture is manifested in the form of research work and the books in which she is presently involved.

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Sunder Nursery, Delhi's Heritage Park, New Delhi (2018)

28.594268, 77.245411

The site of Sunder Nursery lies on the five-centuries-old historic route of the Grand Trunk Road, on the eastern city fringes, beyond which flows the river Yamuna. It shares its southern boundary with the World Heritage Site of Humanyun's Tomb and its Gardens. With a series of gardens, an artificial lake, an open air amphitheatre, an exhibition gallery, an interpretation centre, an arboretum, micro-habitat zone, green house and plant nursery, the park provides experiences for contemplation, reflection and discovery. With more than 150 mature trees, scattered monuments, tombs, remains of structures, pavilions, wells and mosque platforms of the Mughal period, this "archaeological park" possesses a unique cultural heritage. Another historic layer belongs to the more recent past. In the early decades of 20th century, during the planning and construction of Capital City New Delhi, the site was used by the British as a plant nursery for the rearing and propagating of trees and plants. Over the years, it has become an indispensable refuge for a variety of birds and butterflies. The design of Sunder Nursery, under the aegis of the Aga Khan Trust for Culture as a recreational, educational and cultural space – a Heritage Park, integrates these cultural and natural assets while addressing the contemporary needs of an urban park in the historic city.

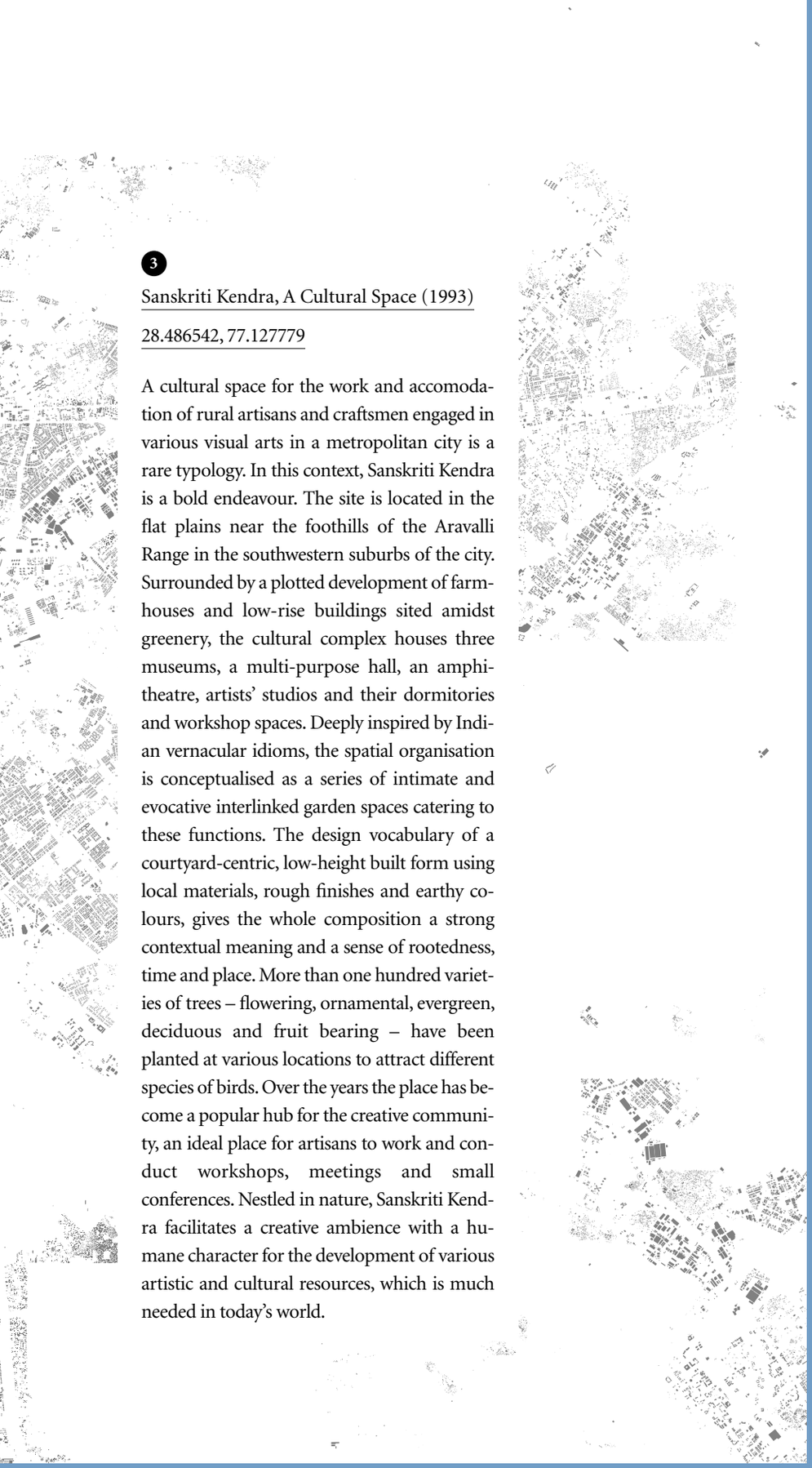
2

Shakti Sthala, A Memorial (1989)

28.644153, 77.248398

The site of Shakti Sthala (Abode of Energy), the memorial to the late Prime Minister Indira Gandhi, marks the central part of a large afforested belt developed on the reclaimed flood plains of a redundant channel of the river Yamuna. Nestled in the green serving as a final resting place for many national leaders, the place is envisioned as a series of interconnected hillocks and a series of valleys with an artificial lake. Varied compositions of rocks and boulders are interspersed throughout the whole site. The main sanctum is an upright sentinel, a ten-metre-tall iron-ore rock standing on a square base. A variety of views – the main memorial rock with a background of evergreen trees, sweeping meadows, rock compositions framed by flowering trees, meandering pathways shaded by fine textured trees, the aquatic life of an artificial lake – evoke many emotions. Shakti Sthala pays tribute to the departed soul while enabling people to engage with nature.

Map: schwarzplan.eu Map Data openstreetmap contributers



3

Sanskriti Kendra, A Cultural Space (1993)

28.486542, 77.127779

A cultural space for the work and accomodation of rural artisans and craftsmen engaged in various visual arts in a metropolitan city is a rare typology. In this context, Sanskriti Kendra is a bold endeavour. The site is located in the flat plains near the foothills of the Aravalli Range in the southwestern suburbs of the city. Surrounded by a plotted development of farmhouses and low-rise buildings sited amidst greenery, the cultural complex houses three museums, a multi-purpose hall, an amphitheatre, artists' studios and their dormitories and workshop spaces. Deeply inspired by Indian vernacular idioms, the spatial organisation is conceptualised as a series of intimate and evocative interlinked garden spaces catering to these functions. The design vocabulary of a courtyard-centric, low-height built form using local materials, rough finishes and earthy colours, gives the whole composition a strong contextual meaning and a sense of rootedness, time and place. More than one hundred varieties of trees – flowering, ornamental, evergreen, deciduous and fruit bearing – have been planted at various locations to attract different species of birds. Over the years the place has become a popular hub for the creative community, an ideal place for artisans to work and conduct workshops, meetings and small conferences. Nestled in nature, Sanskriti Kendra facilitates a creative ambience with a humane character for the development of various artistic and cultural resources, which is much needed in today's world.

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#2

EDGE CITY
– Ode to the city

ALEXANDER GUTZMER

Our author cannot but write about COVID-19. The big C is everywhere. Whereas some people are hyping the new era of digitalization for lack of urban life, he is quite sure about the fact that virtual spaces will never replace real urban space.

I have to apologize, dear reader. I thought long about how to write a meaningful coronavirus-free column. I know many of you are tired of all the corona-ing. I certainly am. And yet, it seems impossible, and kind of ridiculous, to touch upon urbanist topics and completely ignore the impact of COVID-19. The big C is everywhere. And so, for better or worse, it is also here in this column. And with significant force. I started out to write a column about urban peculiarities, about edge phenomena in the realm of cities. These things exist, in new ways. Things like the jellyfish that are now seen in the canals of Venice, because the other viral epidemic in Venice – tourists – has disappeared. Social media posts about such pandemic-induced urban transformation phenomena are popular these days. And so is the idea behind it: that coronavirus somehow leads to a wiser, more self-aware, somehow better life, also in our cities. A promising, romantic idea. And, for me, a terribly naïve one. The slowdown our urban life has been experiencing for some weeks now couldn't possibly be the model for a new, somehow more sustainable way of living. It is the result of a crisis, and one that leaves many of us profoundly affected. A friend of my wife, secretary of finance of the German state of Hesse, actually committed suicide because he was overwhelmed by the dimensions of this crisis. The drastic lockdown struck particularly hard at those of us who have always believed in the cultural productiveness of the urban sphere, a richness that grows out of encounters that take place beyond that realm that has become so intensely valorized recently: the home. "Home" as in "stay (the-fuck)home", "workfromhome", define your entire social cosmos around this home. "Home" is the antidote to the city. Home means being surrounded by four walls, it means seclusion, safety, risk adversity. The city is the very opposite of that. I have always seen city life as fraught with a degree of insecurity. An entirely safe city is losing out on citiness. In that sense, coronavirus has been anti-urban and hyper-urban at once. Anti-urban as it drives people away from the streets. Hyper-urban as it creates a sense of space in which living spatially has become the very equivalent of (potentially deadly) risk. What coronavirus has never been is aspatial. Quite the opposite: it creates its own spatialities. In a research paper, Social theorist George Rossolatos outlines how it does that. By adopting a fictional ontological stance, he identifies the coronavirus' hyperspace, describing it as "literary spacing". He shows how familiar urban spaces, cultural practices and intersubjective communications are redefined, repurposed and reprogrammed. Rossolatos calls this process "terrorealization". For him, coronavirus tells its own urban story – the story of city space as terror. And yet, what is the alternative to living an urban life? Where are the productive insecurities, the fascinating chance encounters when city life gets suspended? In the digital sphere? This is an interesting and somewhat surprising side aspect of the pandemic: that the world of the digital turns out to be a big disappointment. We're communicating via video conferencing software all day long, we send out loads of invitations for social formats that we know from the world outside, now combined with the phrase "virtual" – virtual conferences, virtual parties, etc. And it just isn't the same. The virtual everything world is one of a surprising flatness. Even social media activity feels somewhat stale these days. Sociologist Armin Nassehi recently wrote in his book Muster (Pattern) (so far only available in German) about the digital sphere as the permanent doubling of the real (real as in physically "out there", urban). But if there is nothing to double, this process is meaningless. This is the one thing this pandemic has taught us: it has not exposed the "destructive nature of capitalism", nor has it alerted us to the "stress our daily life puts on us". But it has strikingly revealed the value and complexity of the urban realm, the beauty in the process of creating ever more strange constellations of architecture, people, infrastructure, ideas. To me, this is proof that Rossolatos' "terrorealization", even if powerful, cannot win.

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Writer and cultural theorist **ALEXANDER GUTZMER** has always been interested by the strange and peculiar aspects of urban life. He holds a PhD from Goldsmiths College, London, and is professor for communication and media at Quadriga University, Berlin. His writing ranges from architecture and media culture to marketing, management and urban economics.

Photo: Daniel Perales

„When we develop playground equipment, the play value comes first for us. It is our claim that our play offers exert a high challenge character and a continuous play incentive, so that an elementary play need develops. First and foremost, however, children should be able to immerse themselves in the play and have fun and joy with our equipment.“ – Julian Richter sen.