

Edges, Interfaces, and Nexus: New Paradigms for Blue Urban Landscapes in the Gulf

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Gulf cities are generally characterized by their extremely rapid development with resulting demographic increases and imbalances and accompanying environmental degradation. These cities are the flagships of emerging countries that are constructing their national identity while seeking to preserve their traditions and customs and conserve their environments. As they are importing cultural and educational brands, business, and marketing models, they are also creating new hybrid forms and a particular Gulf identity or Gulf urbanism. Until now, resources, technology, and capital have allowed expansion without limits—into the ocean with landfills and artificial islands, into the sky with tall buildings, and into the desert with Zero Energy Cities. Yet the future of nonrenewable energy sources is leading Gulf cities to look towards new postcarbon identities for their countries and improved sustainability and livability for their cities.

Transit networks and transit-oriented development, public art and public realm, ecological infrastructures and landscapes, blue urbanism that looks at the interface between the city (urban) and the ocean ecosystems, urban biodiversity, food urbanism, city branding and urban legacies of mega events, ecotourism, and protected areas are some of the drivers of the next generation of urban and landscape plans. Additionally, as Gulf Cities emerge more and more in the limelight through international media and mega events, there is increased pressure to create more livable conditions for the large number of transient workers and to extend the concept of livability to all tiers of society, thereby creating a more integrated public realm.

A comparative and integrated approach is necessary to understand and analyze the challenges facing Gulf cities, and the ways in which different scales of urban and landscape planning and design can best address them. Planning has to be considered at the regional and Gulf scale, as well as at the local and neighborhood scale, especially regarding such topics as public transport infrastructure, water networks, renewable energy networks, food security, minimal dwelling, and urban cultures. There is also a necessity to look at the urban systems and the idea of the regenerative city and/or region, and to close the loops of the resource waste and excessive expenditure. For example, in the near future, the GCC Rail network will shrink the time distances and increase exchange between major cities in the Gulf. Additionally, new, more integrated, and more efficient systems for water, waste, and energy production and recycling will be needed to sustain the growing cities.

The recent Gulf crisis—which began on 5 June 2017 and resulted in a schism between Qatar and its neighbors in the Gulf—Saudi Arabia, United Arab Emirates, Bahrain—is currently challenging these regional visions for planning and development in the Gulf. However, it is perhaps amid the crisis that we should look to the planning and design disciplines to create new visions and geographies for the future of the region. It is believed that in every crisis, there is opportunity, therefore we should look to see how

our disciplines can be challenged and refined to respond to the new political and economical geographies, and perhaps to future visions of a more resilient and integrated Gulf region. It is the role of landscape urbanists and planners to look far ahead, and to envision the regenerative systems, infrastructures, and landscapes that will ensure a healthy and secure future for the Gulf countries. In the face of climate change, rising sea levels, food, water, and energy insecurity, and loss of biodiversity, citizens, communities, and nations must work on common visions to address these future challenges. As proposed by Farhad Nadim, Amvrossios C. Bagtzoglou, and Jamshid Iranmahboob in their paper on Coastal Zone management in the Gulf,¹ the littoral countries should focus on protecting the environment and demilitarizing the Gulf as it is sustainable ecology and economy, and not arms and military bases, that will improve the livability of the region's citizens. The researchers believe that the Gulf marine environment has already surpassed its buffering capacity, with very poor circulation of water and increased salination and pollution.

This essay looks at three spatial approaches to discuss the emerging issues of urban landscape design in the Gulf region: the edge, the interface, and the nexus. *The edge* goes from green to blue and addresses the coastal interface between land and sea, the rise in sea levels, blue belts, and integrated coastal zone management. *The interface* examines new gateways and borders, on land and at sea, through the lens of infrastructure, landscapes, biodiversity, fluidity, and cross-border collaborations for species conservation and ocean health. *The nexus* is an approach to regenerative systems for food, water, and energy through designing productive landscapes to increase food security by maximizing resources such as water and energy, and minimizing waste.

While green is seen as the color of sustainability, there is no oasis or green without the presence of water, a rare resource in desert climates. Desalination plants provide most of the Gulf countries' water but this has numerous affects on the marine environment, aside from the high use of nonrenewable energies.² The world is blue, and oceans cover most of its surfaces. Our environmental health and indeed our survival—our systems of food production, energy, transportation, temperature regulation, oxygen production, carbon sequestration, and more—are dependent upon the earth's waters.³ Additionally, 60 percent of the world's cities lie on a coastline, and marine sprawl is a new concept to describe the spreading of urban activities in the sea such as boat traffic, shipping, fishing, and dredging.

Military conflicts, lack of harmony among Gulf littoral states, and diverse prioritization of coastal issues have impeded the implementation of a sustainable coastal management program in the Persian Gulf region,⁴ where the GDP has increased rapidly in the past few decades. With the Gulf crisis, it is timely for authorities, planners, designers, environmental scientists, and coastal managers in the Gulf states to focus on smart-planned development, which includes coastal preservation and ecological protection. Blue Urbanism, coined by Timothy Beatly,⁵ is an emerging set of ideas and perspectives around developing a mutually sustaining relationship between cities and oceans, where city planning carefully evaluates and regulates the effect of urban development on the marine environments. According to Beatly, cities should have jurisdiction over near-shore habitats and extend their zones of planning and management to offshore areas. Coastal zones compromise a very complex system and interacted subsystems, yet the planning of these zones is most often ignored or fragmented by policy and decision

makers, regulators, scientists, planners and designers, economists, locals and beneficiaries, project managers and engineers, and international and regional agencies. Moreover, their complex and dynamic nature makes their management challenging. Qatar's Integrated Coastal Zone Management (ICZM) plan aims to address these issues and to unify objectives and instruments to achieve desired objectives.⁶

Several research and design projects being undertaken by the author and students at Qatar University are addressing the coastal interfaces in Qatar. These projects of new ecologies for the Doha Corniche, which create scenarios for mitigating storm surge and sea level rise, minimizing the pollution of the urban waters, increasing urban biodiversity, creating more socially integrated public landscapes, and designing productive landscapes both in the water and on land using emerging technologies and processes such as micro algae and sea farming as well as ecological engineering.⁷ The Ecological Conservation Master Plan for Al Fuwairit Beach is intended to develop an ecologically protected area for the critically endangered hawksbill turtle by restoring and protecting their habitats, as well as the archeological sites adjacent to the beach, and to strategically plan future developments that will preserve the cultural and archeological assets of Al Fuwairit and curate them for ecotourism. *Dohasis*, developed by the author with Rob Roggema and Marco Casagrande, invites free flooding of the sea to become an active part of the cityscape by introducing a series of controlled cracks in the flood defense walls and by designing free water movement within free spaces in the city. Using soft engineering as opposed to hard engineering techniques and processes, Doha will be prepared to deal with the future rise of the sea level and changing weather conditions. The urban water elements will also act as stormwater relief channels and contribute to the microclimate of the city. New, mixed fresh and salt water greenery will be introduced, developing Doha into a partial urban mangrove and inviting back original site-specific forms of flora and fauna.⁸ Offshore ecological engineering with oyster reefs will contribute to cleaning the polluted sea waters while creating barriers from storm surges, and will bring back pearl oysters, an important aspect of Qatar's traditional culture.

Prior to the current Gulf crisis, the concept of the modern state—introduced into the Gulf by the European powers, coupled with the increasing importance of boundaries to define ownership of oil deposits—were at the origin of territorial and boundary disputes in the Gulf region. The contestation between Bahrain and Qatar over the Hawar Islands was settled only in 2001, after thirty-six years of dispute, and today they belong to the island of Bahrain. Plans for a friendship bridge to link the peninsula of Qatar to the island of Bahrain, inscribed in a new regional rail network for the GCC countries, have been drafted.

However, recent events have shattered the Gulf geographies and the Gulf Cooperation Community, and not only interrupted the flow of resources to and from Qatar, but also shut down the air, sea, and land borders between Qatar and the neighbouring states. The Hawar Islands, situated off the East coast of Qatar close to Bahrain, lie on the path of thousands of endangered migrating birds, playing an important role in regional marine ecologies. Khor al Adaid, also a formerly disputed border zone, is a unique assemblage of terrestrial and marine environments with a large tidal embayment lying in an area of mobile dunes that straddles the border with Saudi Arabia, and it is recognized as being of global ecological importance. Both of these border areas have been nominated as UNESCO World Heritage Sites and could one day become zones of cross-border

ecological cooperation that could guarantee lasting human and ecological security between Qatar and its neighbors as well as provide well-designed and managed spaces for nature observation. Scientific research, stakeholder engagement, and ecological master planning should be undertaken as a way to engage cross-border collaboration between scientists and nature conservationists on both sides of the border, with the aid of international NGOs such as UNESCO, International Union for the Conservation of Nature (IUCN), and the Ramsar Convention on Wetlands. The example of the Korean DMZ, the Cyprus Green Line Buffer Zone, the Jordan River Valley, and other transboundary areas in conflict or contested zones can be examples for these projects when scientists, artists, academics, and NGOs on both sides collaborate in common future visions despite the current crisis/embargo.

One research and design project that aligns with these visions, undertaken with students at Qatar University's Master in Urban Planning and Design, is the Gulf Eco Gateway and the Masterplanning for the Hawar-Al Reem Transboundary Protected Biosphere Reserve. The First project builds on the proposed Bahrain Friendship bridge, which would connect and link the high-speed rail network that is planned for the GCC. The second is a proposal to link the Al Reem Biosphere reserve, proposed as a UNESCO site, with the Hawar Island Protected Area. The conservation of Nature, species, and ecosystems cannot be undertaken in isolation, and this project is a great opportunity to continue working on collaborative visions despite the current crisis. As mentioned earlier, it is imperative that research projects on borders and transboundary cooperation between scientists, nature conservationists, and artists continue being conducted despite the crisis in order to prepare the ground for when the conditions are ripe for implementation.⁹

With the blockade of Qatar in June 2017 by a several Gulf states, including Saudi Arabia through which 80 percent of its food transited, Qatar had to rapidly resource its imports of food through Iran and Turkey. While it has ample reserves of nonrenewable energy through its offshore gas fields, it relies on desalination for most of its sweet water resources. Additionally, the air quality in the main city of Doha is very poor because of the effects of the fossil fuel industries and automobile reliance. According to the World Health Organization, Doha is one of the most polluted cities in the world. While Qatar has managed to find alternate sources for food, this is not without a cost, and the rise in food prices, as well as the government subsidies, are arguments for finding additional domestic food sources and productions, as well as more resource efficient ways to produce food and other goods, and to increase recycling of organic and nonorganic wastes.

Cities are regenerative systems and, like all organisms and ecosystems, run on positive and negative feedback loops. Positive feedback loops stimulate growth and expand a system; negative feedback loops limit or contain a system within boundaries. Much of what a city considers waste is actually a valuable input and a start of a regenerative system. Organic waste is currently not recycled systematically in Qatar. Organic waste from landscape companies, produce, animal markets, restaurants, homes, hotels, office complexes, and universities could be collected and composted to create soil amendment and healthy, moisture-holding local soil not dependent on the chemical fertilizers and imported organic materials currently used. Trees that die and pruned branches would be laid down, buried, or chipped and allowed to decompose to support fungal

communities.¹⁰ It is therefore vital to revalue the city's waste streams as foodstocks and to set up processes to redirect them to feed other systems within its organism/ecosystem.

Capturing the rising amount of rain, storm waters, and dust creates the resource and material for establishing new urban organic layers key to the city's sustainability. Materials brought to the city—whether water from the sea (desalination, sea-level rise, or storm surge) or dust from storms—have the potential to transform a desert into an oasis. With a combination of modular environmental technology, open form infrastructure, and landscape urbanism, these material streams will become a steady source of power for the new organic layers of the city composed of parks, trees, water elements, wetlands, green roofs, wild nature, urban farms, and collective gardens. These layers reduce the heat island effect of the city, produce a comfortable microclimate, encourage pedestrian movability, and create an attractive public entourage and a new urban ecological luxury.¹¹

Research Projects by the author, related to the Food Water Energy Nexus, include visions and plans for a regenerative and resilient University Campus at Qatar University. The campus is proposed as a living lab for research and implementation of new, food-producing technologies and regenerative systems, with a better use of renewable resources and recycling of waste. The project will contribute to food supply to the university and promote biodiversity on campus.¹² Using examples from edible university campuses worldwide—that is, universities that are implementing food production on their lands and public spaces—as well as literature on permaculture, food urbanism and edible landscapes, students and faculty identified strategies and best practices for implementing this vision for Qatar University which includes retrofitting of existing buildings with green roofs, green walls, and biodiversity habitats, transformation of existing landscapes, use of empty lands for food production, and modification of the urban design of future buildings with integrated food gardens. The permaculture approach includes the concepts of systems thinking and maximum resource efficiency and is used as the philosophy and framework for all the proposed interventions. These include water recycling and treatment, organic waste recycling, and the production of clean and renewable energy. The project also includes awareness campaigns, citizen participation, and the collection of quantitative data on the concept of food miles, that is, the amount of miles that food travels until it reaches our plate.

At a recent conference in Qatar that I chaired, representatives of the landscape industry, consultants, the public sector, and academia discussed the future of the landscape industry in relation to the Gulf crisis. Aside from the opportunities that any crisis offers, with more resources efficiency, self-reliance, and resilience, there is also a concern about the status of landscape projects in the hierarchy of economic interests and budgets, as well as in the project management process. With reduced spending, landscapes projects, which are still considered beautifying amenities and an “icing on a cake,” are often defunded or even eliminated. Landscape departments have been closed in important public works and planning administrations. At the same time, the landscape industry is coming up with innovative and highly cost-reduced solutions such as use of native plants and reducing water consumption, but these projects are not being accepted in the planning and construction authorization permission process.

The author has suggested that it is time to elevate landscape to the role of infrastructure—and to position it as a foundation for urban and architectural projects.

In the words of the great landscape architect Ian McHarg,¹³ who has inspired many of the landscape urbanists, it is imperative that “we work with, and not against, nature” in shaping our cities and environments. Doing so requires a shift in the conceptualization of urban plans, and plans that begin with natural systems and integrate technological solutions, with the aim of giving back to nature and the biosphere.¹⁴ Perhaps the Gulf crisis will be an opportunity for landscape to take a leading role and its right place in the design and development of future Gulf cities and landscapes.

NOTES

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⁴Nadim, Bagtzoglou, and Iranmahboob, “Coastal Management.”

⁵Timothy Beatly, *Blue Urbanism: Exploring Connections Between Cities and Oceans* (Washington, D.C.: Island Press, 2014).

⁶Ayman Afifi, Said Al Muqaddam, and Sophie Hagan, “Overview of the Integrated Coastal Zone Management (ICZM) Plan Project for the State of Qatar” (booklet publication for public information dissemination and education, Ministry of Municipality and Urban Planning/Wataniya Environmental Services, Qatar, 2016).

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⁸Rob Roggema, Marco Casagrande, Marco Grichting, and Anna Grichting, “Dohasis: The Biourban Restoration of Doha” (paper presented at the workshop “Sustainable Urbanism – New Directions,” Qatar University, 2017).

⁹Anna Grichting and Michelle Zebich-Knos, *The Social Ecologies of Border Landscapes* (London: Anthem Press, 2017).

¹⁰Nance Klehm, “Subject and Object. Spirit and Matter” (paper presented at the workshop “Sustainable Urbanism – New Directions,” Qatar University, 2017).

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¹³Ian McHarg, *Design with Nature* (Hoboken, N.J.: John Wiley and Son, 1992).

¹⁴Anna Grichting, “Extradisciplinary Investigations—Antidisciplinary Spaces Sustaining Future Urban and Social Systems” (paper presented at the workshop “Sustainable Urbanism – New Directions,” Qatar University, 2107).