



## **FORWARD TOGETHER**

November 13–14, 2018

San Francisco

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### **Proceedings of the 2018 US/ICOMOS Symposium**

#### ***Forward Together: A Culture-Nature Journey Towards More Effective Conservation in a Changing World***

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*This symposium was convened to share insights on how understanding culture-nature interlinkages on many landscapes and waterscapes can shape more effective and sustainable conservation.*

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**2018 US/ICOMOS Symposium**

*Forward Together: A Culture-Nature Journey Towards More Effective Conservation in a Changing World*  
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**Temple Tanks in the Landscape:  
A Culture Nature Approach in Ekamra Kshetra, Bhubaneswar**

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**Abstract**

Contemporary Asian planning has largely ignored the natural context in managing historic water systems. Water bodies are being adversely impacted by urban sprawl, which is evident in most historic cities in India. For the city of Bhubaneswar, the water bodies are disappearing within dense development and those that continue to exist are highly polluted. The natural drainage systems that regulated quality and quantity are being disrupted as municipalities are unable to visualise the larger ecological context. Despite this deep physical disconnect in the landscape, the intangible practices of ritual bathing and other traditions related to water continue on the steps of these tanks. This is a discouraging trend within a culture that is deeply embedded in traditional ecological knowledge, where nature and culture are inseparable (Larsen and Wijesuriya, 2017). This paper presents a project that showcases the rejuvenation of a historic water catchment system by revisiting its connection to the natural context. Rejuvenation and Sustainable Conservation of Bindusagar and its Periphery Tanks is a project undertaken in the Ekamra Kshetra (historic core) in the city of Bhubaneswar, a site on the Tentative List of World Heritage in India (since 2014).

**Keywords:** Culture, Nature, Heritage, Water, Temple, Historic Tank, Bindusagar, Ecology

## **Temple Tanks in the Landscape: A Culture Nature Approach in Ekamra Kshetra, Bhubaneswar**

Bindusagar is a large water body (450 m by 175 m), associated with the 1000 year old Lingaraj temple in the old city of Bhubaneswar. Due to the limitations of the urban approach, where the tanks are treated as individual entities, all efforts at cleaning them over the years have met with failure. For this project we have proposed a longer term and multifaceted solution to their revitalisation. Using a culture nature approach, this project addresses the severe water pollution challenges for Bindusagar and 5 other tanks in its vicinity within the context of their original natural landscape. These tanks were located on low lying terrain, part of a carefully planned water harvesting system within the natural terrain of Bhubaneswar. This project entails an analysis of these water bodies, their interconnectedness within a larger natural context and recognizes the relevance of topography, hydrology, geology and other nature-based disciplines. Working with the municipality, the project team has attempted to introduce the landscape approach to an urban renewal scheme for these historic areas. This culture nature approach addresses the larger natural context of traditional towns to ensure the sustainable future for the historic water systems.

### ***Statement of Challenge***

“Why has environmental decline been so pronounced in Asia if, as has become widely believed, Asian religions promote environmental responsibility?” (Taylor, 2005). This statement highlights the contradiction in most cities in urban India. Cultural practices that have inherently respected nature continue alongside the exploitation of water systems. Remedial action towards environmental pollution in historic areas has to begin with an understanding of continuity, connectivity and collaboration of the natural and cultural context.

### ***Introduction to the Site***

Located on the eastern extent of peninsular India, around 700 kms. from the Bay of Bengal, the city of Bhubaneswar is part of the eastern coastal plains of Odisha marked by Mahanadi River in

the north and Chilika Lake in the south. The landscape is defined by highpoints and ridgelines that descend into lower elevations. Daya River lies eastward of the Bindusagar tank and is at a lower level indicating that the terrain is sloping from east to west and the tanks lie in between indicating a possible historic system for harvesting run off.

Set in the midst of this natural landscape is the historic Ekamra Kshetra (translated as land of mango groves). This region has a long history stretching from the 3<sup>rd</sup> to 15<sup>th</sup> century AD. (Fig. 1).



**Figure 1.** Natural context of Bhubaneswar City. Source: Author, Base Map: Google Earth.

Ekamra Kshetra comprised 45 villages and was divided into Ashta-Ayatanas or eight sacred precincts, each with its water body, temples, small shrines, tirthas (pilgrimages) and prescribed procession routes ritualistically and symbolically connected to the Lingaraj Temple. This is an

outstanding example of Hindu city planning based on the application of the Mandala concept, representing a unique system of ancient town planning vis-à-vis topography, location and orientation of water bodies, land use and zoning (UNESCO World Heritage Centre, n.d.).

In the case of Ekamra Kshetra, the iconic Bindusagar tank (built in the 7<sup>th</sup> to 8<sup>th</sup> Century AD) is believed to have predated the renowned Lingaraj temple (built in the 11<sup>th</sup> Century AD, though some accounts state that it may have been conceived in the 7<sup>th</sup> Century AD around the time of construction of the tank). The Bindusagar tank is iconic in this landscape. This is evident as the Lingaraj temple follows the location and orientation of this tank, as do other water tanks and temples in the vicinity. The footprint of Bindusagar is nearly double that of the temple complex. The interrelationship of tank and temple is a subset of a larger narrative of ancient temple buildings in the larger cultural landscape where there are over 500 temples, many of which are associated with tanks that have been either built upon and lost or are extant but suffering eutrophication (Cprecevis.nic.in., 2019). Temple tanks in ancient and medieval India were built in response to the natural context, terrain and hydrology among a host of other factors. A water tank was built adjacent to a temple or temple complex and, at times preceded construction of the temple. The water tank was vital to ancient traditions and this cultural significance protected it from misuse. This was the case for most natural heritage systems, as their basic value for survival was understood, respected and safeguarded.

In the mid-20<sup>th</sup> century a new city of post independent India was designed by Otto Koehnigsberger to the northwest of the Ekamra Kshetra. The two cities showcased two different approaches to planning and led to a deeper disconnect in the cultural landscape (Fig. 2).

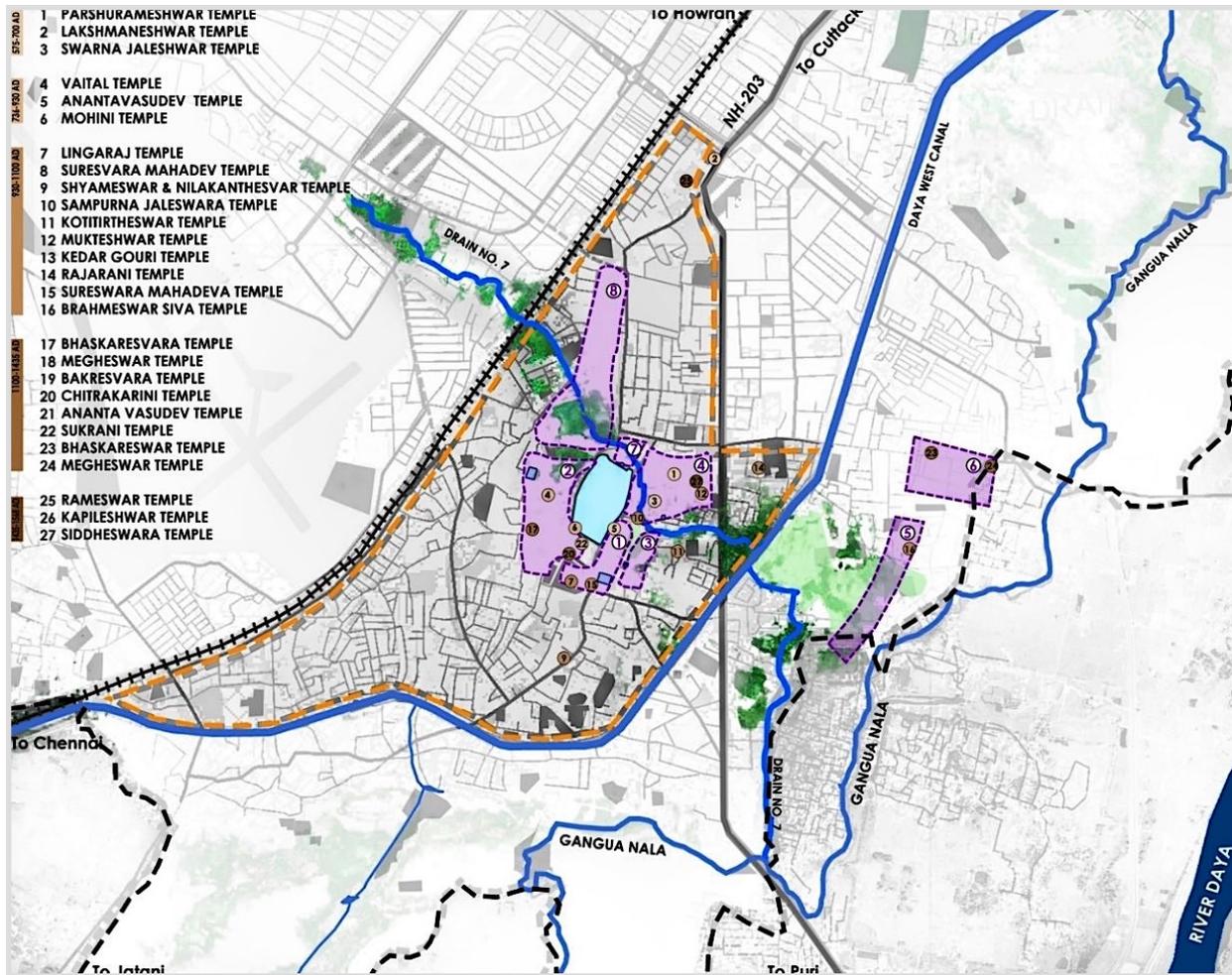


Figure 2. Ekamra Kshetra: Special Heritage Zone. *Courtesy of the author.*

### Challenges

Dubbed as the “Temple City” – because of the high density of temples that once stood here, the landscape showcases a cluster of magnificent temples, constituting virtually a complete record of Kalinga architecture almost from its nascence to its culmination with the Lingaraj Temple (UNESCO World Heritage Centre, n.d.). Some of these temples are still functional, involving intangible living traditions, rituals, festivals and other observances believed to be centuries old. Ensuing decades have left a divide between temple practices, use and protection of water systems, space and its ritual connections. Within the extent of Bhubaneswar old city, a large number of these structures and tanks can be found in various stages of decay. As a consequence, this area is marked by poor ecological health of water bodies, persistent water logging and health

hazards due to limited availability of safe drinking water and sanitation.

The scope of our project involved cleaning up of Bindusagar and 5 other tanks. From the beginning we highlighted the limitations to this scope, which required proposing remedial action on individual tanks without taking into account the larger context, either natural or cultural, to effectively address the problem. The tanks that had been selected were part of low-lying and marshy terrain. The municipality's reasoning for selecting only these tanks, ignoring numerous others in the vicinity, was not clearly laid out. Added to this, the municipality focused on a predominantly engineering approach to address water quality and quantity problems. A broader context and cross-disciplinary understanding of ecological and cultural impacts had not been considered.

### *Analysis*

The tank and temple offer an ideal case study to illustrate the significance of a nature culture approach to the revitalisation of historic water systems in India. To address the challenges of individual tanks within Ekamra Kshetra we need to have a better understanding of the natural landscape within which the tank system was conceived. The natural landscape determined the water source, the relationship between water inlets and outlets, seasonal rhythms of scarcity and excess, and related cultural traditions and recreation trends. The choice of building materials and construction techniques were also related to the landscape.

As part of this project, studies and analyses were carried out using older government owned survey maps to delineate catchment areas that may have originally fed many of these tanks. The landscape was defined by areas drained by open streams. The physiographic features that informed the location and subsistence of these water bodies were important considerations in analysing the current challenges faced by the tanks.

Through this exercise of working out catchments we aimed to demonstrate that the project delineation should be based on physiographic and other nature-based criteria in addition to legal,

administrative and management boundaries. We also highlighted that the solution to the poor quality of these waterbodies lay outside their physical extents as well as beyond the boundaries of the administrative wards of which they were a part. The analysis showed that the two major ridgelines emerging from the north-east may be treated as the edges of the catchment area, and any solution to their long-term survival needed to address this larger catchment.

Today these catchments are densely developed and highly fragmented, negatively impacting the water source and flow. Urbanisation trends have not respected the tank context or the natural storm water systems that fed Bindusagar and other tanks. Adding to the problem, many of the developments lack sewerage and are dumping their waste into the storm water drains, which feed (directly or indirectly) into the tanks.

### ***Particular Challenges to the Site***

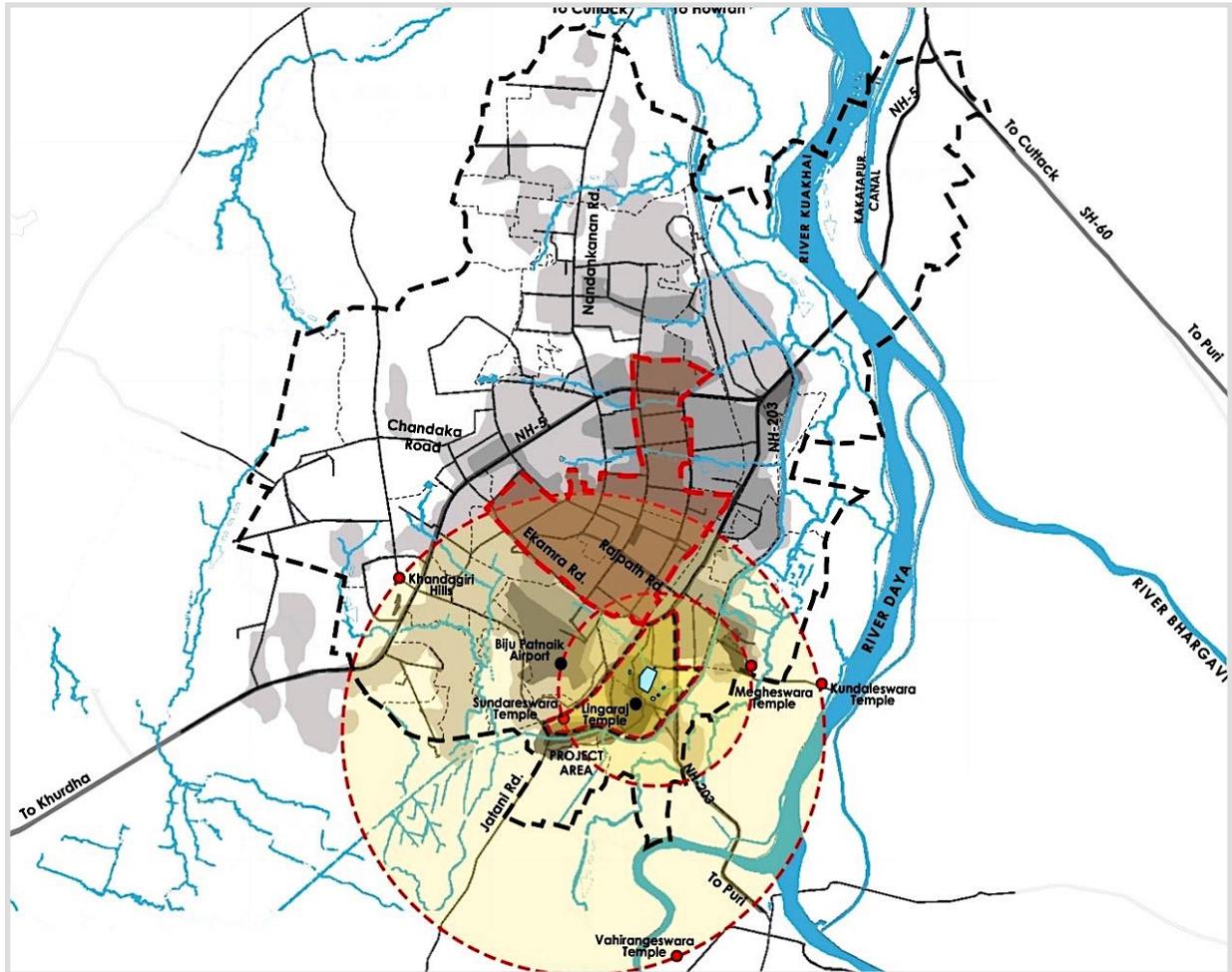
One of the main challenges at the site is the combination of pollution and eutrophication of the historic tanks. Worship and daily ablutions and rituals do not seem to be impacted by this harsh reality and continue despite this toxicity (Fig. 3). The catchment area is marked with poor ecological health of water bodies, persistent water logging and health hazards, and limited availability of safe drinking water and sanitation.



**Figure 3.** Use and Misuse: Bindusagar Tank: Rituals. *Courtesy of the author.*

From 1954 onwards, the process of spatial growth of Bhubaneswar city was slow, but gradually

the city emerged as one of the fastest growing cities of the country. The sprawl in this period extended to the north and south-west (Fig. 4). This rapid densification has challenged the significance of Old Bhubaneswar, which has to compete with the new town in terms of ecology and infrastructure.



**Figure 4.** Morphological Growth of Bhubaneswar City. *Courtesy of the author.*

As per a report published by CSE in 2012, large parts of the city lack adequate sewage treatment systems, leading to pollution of adjoining rivers, lakes and ground water (Cseindia.org., 2019). Only a third of the city's households have a sewage connection while the rest use septic tanks. Between 19 to 30 percent of the city's population depend on groundwater for domestic use (Jacob, 2012). Therefore, an estimated 173 million litres a day (MLD) of untreated sewage flow into the rivers near the city (Cseindia.org., 2019).

Another indicator of the extent of apathy towards our common knowledge of terrain is that Old Bhubaneswar area, especially around Bindusagar Tank and Lingaraj Temple has become highly vulnerable to natural disasters due to construction in low lying areas along the natural drains (CDP, 2010). Owing to the haphazard development, flood water is unable to drain freely into the water bodies resulting in water logging in and around the project area (CDP, 2010).

Unauthorized encroachments occur at bunds, slopes of banks as well at entrances and around the tanks. They vary from tiled sheds, thatched huts, temporary and semi-permanent structures like those blocking the entry of Debipadhara Tank. Owing to this, the main supply channels of the tanks are in a degraded condition.

Siltation is a natural phenomenon, but the dumping of solid wastes in catchment areas also leads to silting in supply channels, as seen most prominently in Bindusagar Tank and Godipokhari Tank. The combined impact of this, along with urban silt comprised of plastic bags, water bottles, glasses and other non-decomposable materials, is detrimental to the tanks. Without planning for the urban solid waste management, the restoration programme of degraded temple tanks will not be a success. This again highlights the need of connecting the tanks to a larger context.

### ***New working method***

Our new working method is to adopt a landscape approach to resolve challenges faced by cultural heritage projects. This paper lays out an approach of using the assessment of the natural landscape to understand and resolve challenges of an intensely used cultural place.

A cultural landscape approach attempts to respect the current needs of the worshippers and inhabitants living in a highly polluted environment, continue traditions of the temple and tank related rituals and address current challenges within the natural context of water systems and terrain. Applying the techniques of landscape analysis, topographic studies, grading, and understanding the site through a study of micro catchments we worked with terrain, hydrology, geology, ecology etc. to address the particular water problem, until now perceived as a local, tank specific issue.

Overwhelmed by dense urban development, the Bindusagar tank within the old city is immensely significant as one of the few water tanks that facilitate rituals related to ancestral worship all year round. A community of priests have established their informal seats surrounding the tank for this purpose. The solid waste from the rituals finds its way to the water systems, undermining the intangible reverence towards this iconic tank. The aim of our involvement was to create a network of environmentally sustainable water bodies. It was important to balance the conservation measures with the needs of the town, including residents as well as pilgrims, and to guide the municipality in ways to ensure long-term sustainability.

This project was also successful in organising a series of stakeholder workshops. An informal workshop held at the steps of the site with local politicians and the general public was most successful in its format, timing and management. There could be no better way to demonstrate the nature culture linkage than to present it live to those who will be taking care of the site. Weaving together culture and ecology will provide superior water quality for locals, enhanced cultural connect for devotees, and an enriched ecosystem for biodiversity.

### ***Key insights or lessons learned***

This project resulted in two takeaways for professional practice. First, it underlined the relevance of context, - natural and cultural - to address urban problems in a living urban heritage precinct. Understanding the close relationship between history and geography is a precondition to studying modern Indian urbanism (Gupta, 1993). It helped us in setting our vision that each project is an opportunity to showcase a nature culture approach in addressing the future of our past. This also was an opportunity to weave in intangible cultural practices, which in traditional cultures revere and protect the physical environment.

Second, in the Indian scenario to date, as we have noted, there can be a disconnect between practice and reality that has resulted in revitalisation/redevelopment attempts to fill/bridge the gap using Smart Cities Mission, the urban renewal and retrofitting program developed by the Government of India. However, a digital upgradation and infrastructural investment alone cannot

sustain a city's identity or liveability. Eventually we aim to inform smart city projects and other politically motivated urban (re)development schemes on adopting this landscape approach to address a long term vision of sustainability and livability.

This project encouraged us to look beyond rejuvenation of temple tanks within our project scope in a bid to restore and sustain an ecosystem within a larger catchment area. Weaving together inherent, but now disengaged, components of culture and ecology will result in an ecological setting that provides superior water quality for locals, enhanced cultural connections for devotees, and an enriched ecosystem for biodiversity (Fig. 5). Conservation and ecological restoration of the five tank structures can serve as a pilot project to promote the culture nature approach as integral to long term revitalisation of urban heritage in Bhubaneswar, as well as in other cities that have been nominated for the Smart City Challenge (<http://www.smartcitybhubaneswar.gov.in/about-us/about-bhubaneswar-smart-city-ltd>).



**Figure 5.** Human-Water Interface: Bbindusagar Tank, Bhubaneswar. *Courtesy of the author.*

### *Next steps*

Indian cities are adopting Smart City and other campaigns to reinvent themselves and address their many challenges. 'Smart City Bhubaneswar' promotes a vision for a 'liveable city and eco city' amongst other aspects of a digitally innovative future. Bhubaneswar demonstrates the journey of a quintessential ancient Indian city standing at the cusp of urbanisation.

The future of urban planning for traditional settlements has to rest on the shoulders of a holistic approach that recognises the natural terrain and resources that formed the *raison d'être* of the city. The valuable, irreplaceable cultural heritage is a response to the natural context of landform and drainage systems. The quest to build innovative cities for the 21<sup>st</sup> century must integrate heritage precincts in the overall development scheme. New design guidelines and urban policy should reflect the relevance of natural and cultural heritage at all its different scales in urban planning. The historic core of Ekamra Kshetra has a 1000 year old history of urban development of which some tangible and intangible heritage remains. The Bindusagar tank, Lingaraj temple, pilgrimage routes and traditional practices of ancestral worship within the larger *mandala* planning are expressions of a nature culture unity that today sits secluded in a fragmented and densely populated landscape. Rather than fountains and expensive laser shows, the tank should be reconnected to its natural context within the larger system so that its source and outlets of water can be restored giving renewed meaning to the pilgrimages and religious practices that continue. Scaling up this solution, the historic core and then the city also need to be perceived as a subset of the natural landscape context.

Any new scheme must address the basic needs of its people for clean water, the dignity of practicing their traditions in a clean environment, while balancing tourist inflows and charting towards a viable future for a burgeoning metropolis. Basic measures of protecting natural systems of water flow and connectivity so that construction does not obliterate the storm water channels need to put in place.

Connections between tanks needs to be mapped and protected. Where these are obliterated, they need to be re-established in the least disruptive way.

Recognition of the indivisibility of nature and culture in Bhubaneswar and the application of a landscape approach has the potential of making it the iconic Smart City for India.

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**Nupur Prothi Khanna's** emphasis on collaborative engagements and synergies across disciplines is rooted in her academic background. With graduate and post graduate degrees in Physical Planning and Landscape Architecture from SPA Delhi and Heritage Conservation from York University (UK), her work through Beyond Built Pvt. Ltd. (BBPL), a research based design practice in Delhi seeks to bridge these diverse interests. She is also a voting expert on the ICOMOS Scientific Committee on Cultural Landscapes.