

Indian Regional Association for Landscape Ecology

PANORAMA

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Photo : Kamthi Kiran

Landscape Ecology - Multidisciplinary, Interdisciplinary & Transdisciplinary

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The discipline of landscape ecology was envisioned as the integration of ecological and geographical disciplines. The term coined by the German geographer Carl Troll in 1939 was defined as “the study of the main complex causal relationships between the life communities and their environment” which “are expressed regionally in a definite distribution pattern (landscape mosaic, landscape pattern)”. The discipline developed in the Central Europe from ‘historic planning on human-dominated landscapes’ and in the North America with ‘the general ecology theory’, today is widely used globally in teaching, research and operational activities, including policy and planning. This is well reflected in the scientific peer-reviewed publications, technical reports submitted to funding agencies and multi-lateral international legal instruments pertaining to conservation.

Still the discipline appears delving to hold a wider spectrum of views, theories and methods, and is passing through process of self-discovery. Perhaps with the changes in tools, techniques and technology to better understand the landscape, the discipline which has been fundamentally eclectic and cosmopolitan, is bound to consistently reinvestigate dynamic viewpoints from a host of ecological and geographic sub-disciplines. In fact, it has gone a step ahead by venturing into humanistic approaches across natural and social sciences. In contrast to ecology, it views heterogeneity and spatio-temporal variability as prime casual factors linking patterns and processes across scales. This is for the reason, in a real sense, it addresses the issues of sensitive dependence of ecological processes over space and time including communities of plants, animals and humans.

The pragmatic shift in the applied sciences have made landscape perspective unavoidable in policy and legal mandates, and decision makings. It has potential and applied utility in human-environment geography, environmental sociology, animal behavior, sustainable resource management, agricultural practices and policies, restoration ecology, and environmental ethics, and goes beyond to simulate ideas and hypothesis while engaging these with human dimensions, and contribute to conservation. The science can expand to address the central challenges of forecasting and predictions in spatially complex, temporally dis-equilibrium and multi-scale socio-ecological systems and neo-landscapes. Indeed, it is to provide greater consilience to our capacity to carry comprehensive accounting of landscapes in which we live and on which we depend.

This issue

Landscape Ecology

PAGE 01

Indian Desert Ecosystem

PAGE 02

In Focus: Desert

PAGE 04

Symposium Announcement

PAGE 06

Members' Page

PAGE 06



Photo: Jyoti Kashyap

Indian Desert Ecosystem: A Unique Landscape with Special Biodiversity

JUSTUS JOSHUA | GREEN FUTURE FOUNDATION
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Deserts are one of the unique ecosystems with extreme climate and terrain. They are arid regions that include sandy and salt marshes, where temperature difference during day and night is significant and during most parts of the year is very high 45-50° C. They receive very less rainfall (100-500 mm) with less number of rainy days. In India, Desert is categorised as one of the 10 biogeographic zones (Rodgers and Panwar 1988) and is the largest arid regions in the country occupying 6.6% of the total land area. The deserts in India are divided into two provinces: The Thar or Great Indian Desert, a sandy ecosystem, spread over Rajasthan and parts of Punjab and Haryana and Rann of Kutch including Greater and Little Rann, a saline desert or salt marsh. spread over larger parts of Kachchh district in Gujarat.

Despite extreme climatic conditions, deserts provide diverse types of habitats, viz., grasslands, thorny scrub, last remnant of the tropical thorn forest, wetlands/marsh lands, agriculture lands, and byets (raised small mounds with scrub and grass) within the Rann. The grasslands in the deserts include the Asia's largest Banni grassland, that serves as dual ecosystem during rainy season, with the water getting filled in the shallow depressions, private and government owned grasslands. Another uniqueness of this region, is the affinity it has with eastern part of Africa, in terms of habitat, floral and faunal, thus showing that all continents were single lands mass before the continental drift. Further, the flora and fauna surviving in the desert ecosystem have special adaptation of storing water for their survival. The leaves of the plants are modified into fleshy stem, thorns and in some case very small or rudimentary leaves, The animals are usually less or not active during the day, staying always in shelter and are active only in early mornings and evenings to avoid heat and loss of water, which is a specific adaptation to this ecosystem.

The plant species like *Capparis decidua*, *Prosopis cineraria*, *Euphorbia caducifolia*, *Acacia senegal* and *Acacia nilotica* are some of the predominant plant species, not to mention the diverse grass species it harbours. These deserts are habitat for some of the threatened species like Spiny-tailed Lizard (*Saara hardwickii*), Desert Monitor Lizard (*Varanus griseus*), Great Indian Bustard (*Ardeotis nigriceps*), Lesser Florican (*Sypheotides indicus*), more than ten species of raptors, rarely seen Greater Hoopoe-lark (*Alaemon alaudipes*), Indian Desert Jird (*Meriones hurrianae*), Indian Gazelle/Chinkara (*Gazella bennettii*), Desert Fox (*Vulpes vulpes*) and Indian Wolf (*Canis lupus*). The presences of the wetlands/marsh land in Kachchh serve as the staging ground for migratory birds using the Central Asian Flyway.



Photo: Anil K. Nair



Photo: Sushmita Balasubraman

The Rann or saline desert is the only habitat where the Indian Wild Ass (*Equus hemionus*) is found, in addition to serving as only breeding site in India for Greater Flamingos (*Phoenicopterus roseus*).

This unique ecosystem would sustain its exceptional biodiversity only if the landscape is preserved and protected from the diverse threats it faces. Major threats threatening this desert zones include both biotic (unplanned development - Wind energy farms including transmission lines, and other industrial (mines, power plants, cement plants) developments, tourism, overgrazing, spread of *Prosopis juliflora*, changing land use, encroachment for agriculture and urbanization, water intensive crops-overdrawing of ground water) and abiotic (more instances of draught, salinity ingress, desertification) threats. In order to protect and preserve this ecosystem, there is need for more ecological research and integrated adaptive management inputs, which is presently limited.

References:

Rodgers, W.A. and Panwar, H.S. 1988. Planning a wildlife protected area network in India. 2 volumes. Project FO: IND/82/003. FAO, Dehradun, India, 339 pp



Photo: SBallal



Photo: Kesavamurthy N



In Focus: Desert

AMRITA NEELAKANTAN | NETWORK FOR CONSERVING CENTRAL INDIA

Introduction: It will not surprise readers of our newsletter that the Indian desert biogeographic zone includes one of the most populated deserts in the world – the Thar desert recording 17.44 million people and [23.33 million livestock](#). Along with the arid regions in Rajasthan and Gujarat states this biogeographic zone is roughly 6.6% of the whole country in area and includes grasslands, production landscapes and a host of nomadic pastoralist communities as well as agriculturalists that remain ubiquitous across rural India.

Biodiversity: The creatures and flora that thrive in the desert biogeographic zone are best suited to these climates of low moisture and high temperatures. The floral diversity is remarkable and hosts 682 species (including 63 introduced species). The degree of endemism of plant species in the Thar Desert is 6.4 percent, relatively higher than in the globally famous Sahara desert. The faunal diversity exceeds 1500 species (including invertebrates) and the only known population of Kutch subspecies of the Wild Ass (*Equus hemionus khur*). The Thar and the Kutch deserts with their large grasslands support several endangered species of mammals such as Wolf (*Canis lupus*), Caracal (*Felis caracal*), Desert Cat (*Felis libyca*) and birds of conservation interest like the Houbara Bustard (*Chamydotis undulate*) and the Great Indian Bustard (*Ardeotis nigriceps*). Additionally, the Rann of Kutch and desert biomes that have historically acknowledged biocultural antecedents that include important wintering locations for migratory birds peculiar to these specific and sometimes very small local wintering grounds.

People: Around 12% of all people in the desert state of Rajasthan are indigenous people. The main communities are Bhil and Meena (also spelled as Mina). The Bishnoi community is known globally for their remarkable closeness with nature and being stewards of wildlife in their everyday living. Apart from these above mentioned communities, the Rabari, Kableliya (nomadic and trading in snake venom) and primitive Sahariya are well-known from the desert region, however the list of community in such a biogeographic region is much richer than we can portray here. Additionally, all the indigenous people of the Thar and Kutch regions of the desert biogeographic region have that unique relationship to their environments intact due to the everyday reliance between their communities and the natural world.





Photo: Kalpit Bishnoi

Nature-People Interface: Perhaps a deeper reading of the biocultural heritage of Indian desert biogeographic region needs the following examples to allow readers to go explore more about them –

Bishnoi were wildlife conservationists before the formalization of the field – The Bishnoi revere the Kejri tree. That is an understatement, the reverence to this tree started an entire [bottom-up led community action](#) to hug-trees to save them from being cut-down. Often cited as an inspiration for the other communities and in-part leading to the globally-known ‘chipko’ movement that originated in the foothills of the Himalayas. The Bishnoi rescue animals of all kinds and rehabilitate them at great personal cost and even organized themselves into a function NGO (Bishnoi Tiger Force) to further their goals as conservationists outside of cultural tenets (10 or 29 are on biodiversity conservation!).

Khichan where humans ensure resources for wintering Demoiselle cranes (*Grus virgo*) in a dance year after year: 150 kilometres north of Jodhpur lies the non-descript town of Khichan in the Thar desert. However, for more than 150,000 Demoiselle cranes, [Khichan is the spot](#) to go to every winter as they migrate from breeding grounds from across northern Asia to be fed by humans! A story so remarkable in how intertwined the fates of these birds are with the benevolence of local communities of Jains who made enclosures for them (excluding dogs and the creeping urbanization of humans).

Banni – a novel ecosystem example: The Banni grassland of Kutch stands transformed by the invasive *Prosopis juliflora*, outcompeting native trees and grassland species, altering habitats for wildlife and pastoralist human communities. Moreover, *Prosopis juliflora* changed the very nature of livelihoods of people in Banni – moving from pastoralists to including more charcoal related activities into their everyday lives. With climate change perhaps the changes in the Banni region are uncontrollable or at the very least perhaps the costs of removing all invasive *Prosopis juliflora* and restoring Banni back to grasslands is unlikely, knowing that nature and people have adapted to this new normal. While these ideas are remain debated and explored, [Banni does provide an experimental social-ecological system in which to observe how people transform nature](#) and how ecosystem adapt after breaching threshold levels of change.

**Ecology is Permanent
Economy
–Sunderlal Bahuguna**



Photo: Jakub Halub



Photo: Dhaval Vargiya

1st Annual Symposium

Theme: Landscape Health and Resilience

3-5 OCTOBER 2021
SARISKA, RAJASTHAN

1st Annual Symposium of Indian Regional Association for Landscape Ecology (IRALE) will take place in Hybrid Format (In-Person and Virtual) in the ratio of 30:70.

Registration Fee

	In-Person	Virtual
Speaker/Presenter	INR 5000	INR 2000
Attendee/Participant	INR 4000	INR 1000*
Student Speaker/Presenter	INR 3000	INR 1000
Student Attendee/Participant	INR 2000	INR 1000*

*for non-members (IRALE members can participate virtually for free)

Important dates

Registration & Abstract submission opens
25th July 2021

Registration & Abstract submission closes
31st August 2021

Registration and abstract submission page will be available on the IRALE Website.

Abstract submission guidelines

The presenters are required to upload a word document in the symposium registration page during registration. The document must contain a title, author(s)' full name, affiliation, email of presenting author, abstract and keywords (up to five). The abstract should summarize the objectives, methods, results and main conclusion of the study. The word limit for the abstract is 300 words. The submitted abstracts will be reviewed by the committee and the presenting author will be informed of the acceptance through email.

Membership & Working Groups

Members' Page

Member of IRALE and IALE: You can [register](https://www.irale.org/registration.php) to become a member of [Indian Regional Association for Landscape Ecology](https://www.irale.org/) (IRALE) and will then automatically become a member of the [International Association of Landscape Ecology](https://landscape-ecology.org/) (IALE). Being a member of IRALE, one can avail the benefits/opportunities such as newsletters, access to landscape ecology journal, participation in conferences, resource materials and updates on recent developments in the science and application of landscape ecology.

Functioning of Working Groups: Several Working Groups (WG) have been formed and IRALE members, during registration, are required to specify three WGs with preference. The list of members' names against each WG will be updated on IRALE Website in due course of time. Based on the preference specified by each of the member who registered or updated, the bubble diagram below reflects the interest level for various WGs (all three preferences combined). These groups are dynamic, as more members join and express their interest in different WGs. Based on the first preference for each WG, the members form the core team. From the core teams, thematic champions and leaders shall drive the agenda and enable both mentorship and peer-to-peer learning. If interested, members are free to participate and contribute to more than three WGs.