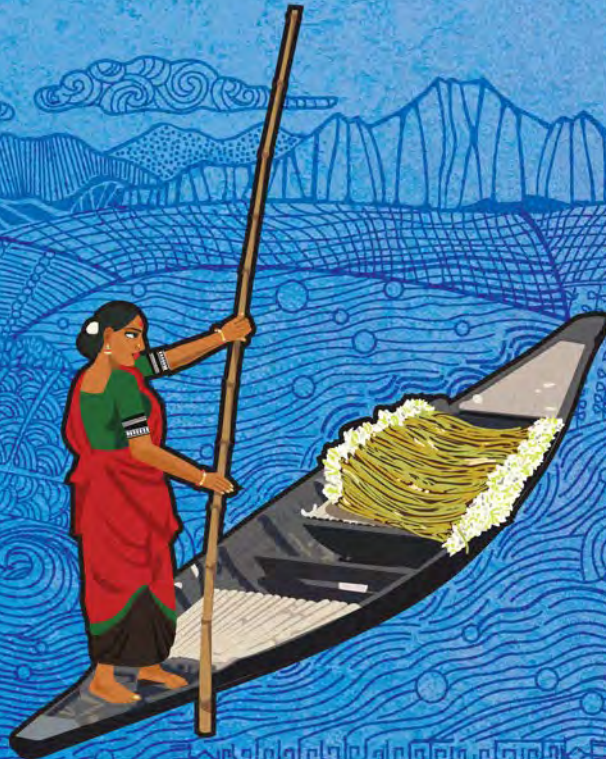




CULTURAL SIGNIFICANCE OF INDIAN WETLANDS



Cultural Significance of Indian Wetlands

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New Delhi, 2023

On behalf of:



CULTURAL SIGNIFICANCE OF INDIAN WETLANDS



मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन
और
श्रम एवं रोज़गार
भारत सरकार



MINISTER
ENVIRONMENT, FOREST AND CLIMATE CHANGE
AND
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GOVERNMENT OF INDIA

भूपेन्द्र यादव
BHUPENDER YADAV



MESSAGE

Wetlands have a deep connection with Indian culture and traditions. From the Loktak Lake in Manipur, revered as *Ima* (mother), to the festival of *Chhath* honouring our relationship with water and sun, wetlands are woven into the Indian cultural fabric. Wetlands are indeed the *Amrit Dharohar* of our country. Our communities have found ways of protecting them through worship, rituals, practices, and arts. Learning from this local wisdom is essential to ensure a healthy and sustainable future for all.

The Mission LiFE, launched by the Hon'ble Prime Minister Narendra Modi, also builds upon India's environment-friendly culture and traditional practices. In this vein, this compilation serves as a step towards documenting the immense significance of wetlands of India.

I congratulate all the contributors of this book along with the Wetlands Division, MoEF&CC and the Wetlands Management for Biodiversity and Climate Protection Project implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) with the support of IKI-BMUUV. I wish that all the readers get to learn more about the ways in which wetlands shape our daily lives & customs and also strengthen their resolve to preserve these practices. After all, the cause of wetland conservation can be achieved with the *sahyog* and *sahbhagita* of each one of us.

Date: 24.01.2023


(Bhupender Yadav)



आहारशुद्धी सन्तुष्टिः



राज्य मंत्री
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उपभोक्ता मामले, खाद्य और सार्वजनिक वितरण
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अश्विनी कुमार चौबे
Ashwini Kumar Choubey

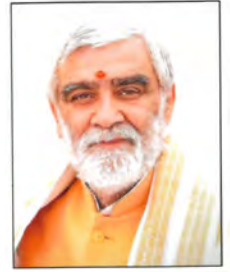
Message

India is home to some of the most diverse and unique wetlands in the world. The Government of India is committed to preserving these *Amrit Dharohar*. The Ministry of Environment, Forest and Climate Change is working in line with PM Shri Narendra Modi's Mission LiFE - 'Lifestyle for Environment'. Our centrally sponsored scheme of National Plan for Conservation of Aquatic Ecosystems provides support and guidance to State Wetland Authorities for wetland management.

Wetlands provide livelihoods sustenance and traditional knowledge that has been passed down from generation to generation. Water is life and wetlands are like the kidneys of our planet; they clean and purify the water we use for drinking, irrigation, and other purposes. Without them, life on earth would be impossible. Hence, it is important to protect and preserve these fragile ecosystems.

These Amrit Dharohar are not only important for their ecological significance, but they also have a deep cultural and spiritual importance to the people of this country. Thus, with the rollout of Mission Sahbhagita, we are encouraging a 'whole-of-government' and 'whole-of-society' approach towards preserving these ecosystems.

During India's G20 Presidency, we seek to find pragmatic solutions for wellbeing of all. Through this publication, we seek to document the rich cultural linkages of our nation to these unique ecosystems and find lessons in our traditions and customs. I extend my regards to the compilers of this book along with the Wetlands Division, MoEF&CC and the Wetlands Management for Biodiversity and Climate Protection Project implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) with the support of IKI-BMUV and hope we all incorporate cultural significance of wetlands in our planning for their long-term sustainability.




(Ashwini Kumar Choubey)

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LEENA NANDAN

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आज़ादी का
अमृत महोत्सव



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पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND
CLIMATE CHANGE



MESSAGE

Wetlands of India are a network of incomparable ecosystems with immense values. In the 75th year of our independence, as we celebrated Azadi ka Amrit Mahotsav, India designated several Ramsar Sites, increasing its network to 75 Wetlands of International Importance, the highest number in Asia. As our commitment to protect these societal and cultural assets grows, the role of 'whole-of-society' approach is becoming more evident. In the Sahbhagita Workshop held in May 2022, we felicitated the Wetland Champions of the country and deeply appreciated the commitment of our citizens towards preserving wetlands.

With Mission LIFE, India has in fact given impetus to a mass movement for nudging individual and community action to protect and preserve the environment. As in any other movement, the drive to conserve and cherish these wetlands, the *Amrit Dharohar*, lies with the people of the nation.

I commend the team of contributors along with the Wetlands Division, MoEF&CC for compiling the essence of Cultural Significance of Indian Wetlands in this book. I hope the book encourages readers to delve deeper into the unique wetland-culture links that exist in our country, right from the snow-laden Himalayas to the coasts of India.


(Leena Nandan)

Dated: January 25, 2023.



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Government of India
Ministry of Environment, Forest and Climate Change



Foreword

With the highest number of designated Ramsar Sites in Asia, India celebrated its relationship with wetlands in the 14th Convention of Parties (CoP) for Ramsar Convention held in November 2022. These designations are a testimony of the nation's commitment to the conservation and wise use of these ecosystems. While the Government of India has laid the policy and regulatory framework, this achievement has been possible mainly because of the community involvement and cultural connection of the Communities with the Wetlands.

The conservation of these societal assets is in fact given wings when people together vow to protect them as cherished heritage. In a hearty display of people action, citizens gave shramdaan by cleaning up the local wetlands during the Azadi ka Amrit Mahotsav. Further, the work being done through the National Plan for Conservation of Aquatic Ecosystems (NPCA) and the State Wetland Authorities helps in integration of efforts of various stakeholders, different Ministries sectors to secure a common vision of healthy wetlands that continue to provide their ecosystem services in a changing world. The 'Sahbhagita Mission' being currently rolled out by the Ministry is another step to enable a society ownership approach with communities leading at the forefront.

As we resolve to enhance citizen engagement in wetland conservation and restoration, particularly the youth of the country, it is imperative to appreciate the numerous ways in which our communities are linked to these wetlands. We hope that this book, developed by the Wetlands Division, MoEF&CC and the Wetlands Management for Biodiversity and Climate Protection Project implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) with the support of IKI-BMUV, is a starting point to understand how the wetlands of the country have been shaped, by our culture.

27 January, 2023


(Sujit Kumar Bajpayee)



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आज़ादी का
अमृत महोत्सव

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T*so, spang, poyka, cheruvu, talaab, jheel, chhapri, tanki, daldal, eri, abar, kere, kund* – wetlands are known by many names across the length and breadth of India, a testament to the diverse wetland types found in India, their presence woven into the vernacular and quotidian.

Wetlands are more than what meets the eye - transient homes to creatures big and small; breeding dens for the aquatic and amphibious; sacred abodes of deities; spiritual sanctuaries; and places supporting lives and livelihoods. Wetlands of India are also examples of common property resources – resources managed by communities through shared norms and values. In the process of managing these commons, communities have evolved customary roles, specialized livelihoods and traditional knowledge systems centred around water, that indicate an expert knowledge of landscapes, seasons, and terrains. Countless wetland complexes across the country serve as fountain heads for rivulets and streams that merge to form mammoth rivers - sustaining and preserving all forms of life that bank on them. This has been celebrated by people in myriads of ways through time. Communities have found ways to venerate the life-giving nature of wetlands, in worship and customs. The reflection of this significance on local art, architecture, music, cuisine, craftwork and livelihoods has been documented both through inscription and oral tradition.

This book is an effort to document some of the cultural practices associated with wetlands. For a land as diverse as India, this is but a step in that direction. The book is organized into five thematic sections – Livelihoods, Wise Use, Faith and Spirituality, Traditional Knowledge and Conservation. With the thread of culture and wetlands running across, these sections are not mutually exclusive. The concepts blend across sections and only the spotlight shifts, emphasizing the importance of all these themes in wetland management. In the process of documenting wetland commons, we have benefitted from the new knowledge commons of the internet – open-source data and creative commons photographs, for which we are thankful. We also thank all the contributors who took out time to share their research and lived experiences which enriched the book further.

We hope that this is a starting point to understand the many facets and complexities of wetlands in India and further the cause of wetland conservation.







"Now the total number of Ramsar Sites in our country has increased to 75...It is a tribute to our age-old culture and tradition of living in harmony with nature."

~ Hon'ble Prime Minister Sh. Narendra Modi

Wetlands are exceptionally productive ecosystems that nurture biodiversity, protect communities from extreme weather events and provide livelihoods. People's dependence on wetlands for sustenance is as old as time itself. Across regions, wetlands are used for a variety of reasons - inundated farming, floodplain fishing, livestock grazing and collection of flowers, leaves and reeds.



Kole Wetlands, Kerala

© Manoj K/Wikimedia Commons





▶ **Woman looking for snails in the
Maguri Beel, Assam**

© Usha Dewani/India Water Portal

The coastal state of Kerala has evolved a unique system of utilising low-lying *Kole* wetlands that prevent flooding during the monsoons and also double up as agricultural fields during the dry season. Additionally, these wetlands provide habitat for several birds, native and migratory. In Karnataka, the communities around Aghanashini estuary have been cultivating a variety of brackish water paddy, the *kari kagga batha*, soaking the seeds in the creek water before sowing. Along with the *kari kagga*, the indigenous *bili kagga* variety has a high salt tolerance as well, and can also be grown in estuarine settings.



The tidal wetlands, locally known as *Ghajinis*, in Uttara Kannada district have supported communal paddy cultivation and helped preserve native paddy varieties for several generations.

Wetlands in low-lying flood plains, such as the *beels* of Assam and *khaals* of West Bengal are also critical for the sustenance of livelihoods in the landscape. Depressions which were once part of the rivers' course fill up post-monsoon, resulting in wetlands that serve as a natural capital for local fishing communities. The Deepor Beel in Guwahati is celebrated by fishers and Bodo-rice farmers alike for being the life-giving elixir it truly is. No Bihu celebration is complete without reverence to and display of fish-catching equipment such as the bamboo *jakoi* (small scoop), *dolonga* (big scoop) and *sepa* (round traps). The Maguri Beel plays a critical role in sustaining livelihoods in Upper Assam. The *beel* provides a rich habitat for fish, snails and aquatic flora that nourishes and sustains local communities.

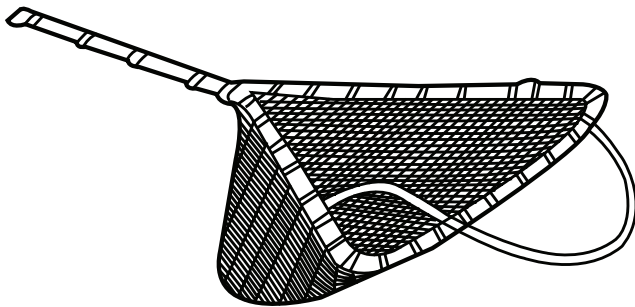
◀ **Deepor Beel, Assam**

© Indrani Phukan/GIZ



Fishing in the Beel

© Usha Dewani/India Water Portal



The Jon Beel *mela*, a three-day festival, has been celebrated in Morigaon district of Assam since the 15th century. Indigenous Tiwa, Karbi, Khasi and Garo people come together to barter goods along the Jon Beel. The star of the *nuan puja* (marking the bountiful harvest) is fish from the Beel, and thus, the festivities *begin* with community fishing in the wetland. The Kaibarta fishing community of Assam is entirely dependent on seasonal wetlands that dot the landscape. Given the unpredictable physical environment, the Kaibartas have assembled a series of rituals to help safeguard their sensitive livelihood.

Ritual taboos are more pronounced during communal fishing trips that tend to last longer than solitary ones. The fishers offer *Ghot Puja* to appease the *Jalkouri*, believed to be the presiding deity of wetlands. The *Ganga Puja*, similar to the *Ghot Puja* is also performed by the head of the family to remove obstacles to their trade.

In India's arid west, transient wetlands and human-made structures are critical for sustenance and livelihoods of communities, particularly the pastoralists. *Nadis*, shallow ponds that catch rainwater, exist in community conservation areas in Rajasthan like the *Orans*, which are sacred grasslands and get their names from the Sanskrit word *Aranya*. *Orans* serve as grazing grounds for local livestock - camels, sheep, and goats. The *Shree Degray Mataji ka Oran* in Jaisalmer is a winter nesting ground for the state bird of Rajasthan, the critically endangered Great Indian Bustard. The *tobas* are seasonal ponds that are formed when rainwater fills up natural depressions. In addition to providing drinking water, they play an important role in sustaining the Bikaner region's substantial livestock population. Herders travel to these *tobas* with their livestock every year and camp in the pasturelands until the grass is exhausted. Before embarking on their journey to distant *tobas*, Muslim pastoralists are known to offer milk and jaggery at the mosque to pray for plentiful pastures.

These stories of wetland reverence are an integral part of the story of India. Recognising wetlands as indispensable systems for the ecological and economic well-being of a landscape is critical. And hence, Taking lessons from our traditional livelihood practices is crucial for the sustainable use of wetlands.



▶ **Rajasthan has a rich tradition of water harvesting that supports lives and livelihoods**
© Seetha Gopalakrishnan / India Water Portal



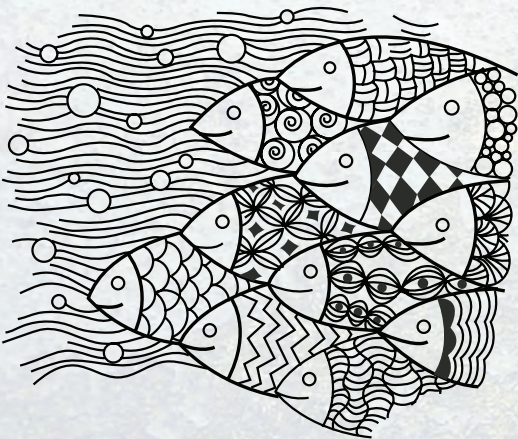
Of Fishing, Farming and Guardian Deities

Pulicat wetland complex, also called The Lagoon of Paalar Basin is the second largest lagoon on the eastern coast. The complex, spread across Tamil Nadu and Andhra Pradesh, comprises of 20 islands, the largest of which is Sriharikota. During colonial times, it was the last bastion of the Dutch, the remnants of which are reflected in the small garrison, lighthouse and cemetery. The large brackish water lagoon receives a perennial supply of freshwater from the rivers, and is endowed with diverse natural resources, including aquatic and terrestrial flora and fauna.

Fishing and farming, the mainstay of the complex, blend seamlessly in this landscape. At least 52 fishing villages are located around Pulicat lagoon, harbouring 30,000 to 40,000 fisherfolk.

The hydrological flows of the terrain determine the community partitioning of resources, be it access, control or custodianship. While the sea faring fishing communities embark on shallow and deep-sea fishing, the inland fisherfolk also cultivate paddy. The choice of cultivar in Pulicat is based on a comprehensive understanding of hydrological flows. The tribal communities of Irulars and Yanadis subsist on hand-picking juvenile prawns and mud crabs that tread in the shallow waters of the lagoon-bed. Systematic reed collection is an established livelihood in some of the villages such as Koraiakupam where the collected reeds are made into brooms.

Guardian deities like *Ayyanar* are believed to protect the villages in Tamil Nadu. The presence of such guardian deities usually demarcates the boundaries of a habitation and provides a glimpse of the characteristics of the landscape.



Pulicat has two such guardian deities. The first is represented by a group of terracotta figurines of boys and girls standing, referred to as *Thambi* and *Thangachi Selais* (Brother and Sister statues). They are seen facing the sea and the local communities believe that they serve as early warning systems. The Tsunami of 2004 had destroyed the figurines and one of the first steps for recovery that the village took upon itself was to mould and place a new set of figurines. Fisher communities of Pulicat also worship the custodian goddess *Kanni*. A festival is held annually in the *Thai* month of Tamil calendar during which the villagers congregate on the beach in a festive-like ambience. It is believed that in response to the drums and chants, the goddess descends into one of the villagers, who then goes into the sea and brings a fistful of sand. This sand is given to the potter who makes four idols for worship. These idols take the shape of local fauna and humans, and are believed to be the guardian deities.



Fresh catch off the boat at Pulicat lagoon

© Seetha Gopalakrishnan / India Water Portal

Where the Rice Grows Below the Sea

In the southern state of Kerala lies Kuttanad, a unique mosaic of landscape patches – deltas, backwaters, marshes, paddy fields and networked backwaters. The site is designated as a ‘Globally Important Agricultural Heritage System’ (GIAHS), the second of its kind in India. It is the only agriculture system in India which practices rice cultivation below sea level. The Kuttanad paddy fields are reclaimed marshlands of the Vembanad wetland system. The rice fields exist as three landscape elements - *Karapadam* (upland rice fields), *Kayal* (wetland rice fields) and *Kari* (land buried with black coal like materials). The FAO recognises that the Kuttanad system of below sea-level farming is an approach to cope with the imminent climate impacts in coastal areas. The mixed agro-system of farming also allows for livelihood, ensuring another income as well as manure supply for the farmers.



Transplanting rice

© Aarti Kelkar- Khambete/ India Water Portal



Kuttanadan Punjayile song

Kuttanadan punjayile kochupenne kuyilale

Kottuvenam kuzhal venam, kurava venam

O.. thithithara thithithai thithai thaka thei thom

*(An excerpt from the song that pays homage to the paddy farms, the people,
the birdcalls and the beautiful melodies and rhythms of the landscape)*

Kuttanad is part of the Vembanad wetland system which has traditionally supported this variety of livelihoods like fishing, mussel harvesting, coconut farming, toddy extraction, traditional crafts of weaving baskets and mats using the dried leaves of Pandanus, preparation of thatching materials using coconut fronds, and the like. In the traditional farming practices that are based on an understanding of local hydrology and ecology, fields are sown at the beginning of the northeast monsoon, and the harvest completed before the onset of the southwest monsoon. Soil fertility is dependent on natural cycles, and low and organic fertilizer applications. To permit the soil to regain its natural fertility, the paddy fields were kept fallow between successive crops. Annual saltwater incursions are not only permitted but considered essential to the soil fertility management as well as the ecosystem balance and biodiversity conservation in the area. The cultivated varieties are then purely native, quite adapted to the ecological regimes of the zone and less manure demanding. Water is bailed out using water wheels (*chakrams*) and bamboo traps (*koodu* or *ottal*) are used for fishing.



Separating grain from chaff

© Seema Krishnakumar

The region is also rich with folklore, songs and the rhythm of boat songs. The Kuttanadan folks songs (*naadan paatus*), are associated with the rituals of different groups and their traditional occupations and borrow heavily from the rhythms of the landscape including the water wheels (*chakrapattus*). References to the fields of Kuttanad have also found their way into the popular culture as well with songs such as Kuttanadan Punjaiyile and Kuttanadan Kaayalile.

The traditional indigenous knowledge which was dynamic, has great value, because it stands as the information base of the society, not only locally, but significant to the global community.

Crafting Plants

Across India, communities depend on wetlands for various resources. This resource dependence is important to sustain livelihoods and supplement incomes, particularly for communities that do not traditionally own agricultural land.

In Odisha, *Sholapith*, Golden Grass and *Nalia* crafts are notable examples of wetland resource extraction tied to local culture. Sholapith craft is closely linked to the worship of Lord Jagannath, the presiding deity of the Jagannath Temple in Puri. The crafts made from Sholapith adorn Lord Jagannath, Subhadra and Balabhadra, and are believed to have originated in their worship. It is also used in making headgears known as *Tabia* for Odissi dancers. To make these, the waterlogged stems are harvested during the months of September and October. After drying, the brown outer sheet is peeled off. This exposes the white soft, spongy sections of the stem which are then cut into smaller blocks and shaped into flowers. A long twig, known as *chuli* is placed atop the hair bun to signify the spire of the Jagannath temple.

Another craft work, predominantly led by the womenfolk of Odisha involves the use of golden grass, known as Kaincha in Odia. It grows to a height of about 5-6 feet and the inflorescent stick, which appears after the monsoon is used for weaving. This humble grass is expertly woven into baskets, mats, hand-fans, pen stands, vases and lampshades. This craftwork is currently providing employment to the artisans organised into nearly 200 Self-Help Groups. Similarly, Nalia grass crafts are also made in the surroundings of Bhitarkanika, making it another wetland from Odisha, and among several others in the country, which lend themselves into local crafts.

▶ **Nalia grass artisans
from Kendrapada, Odisha**
© Shambhavi Krishna/GIZ







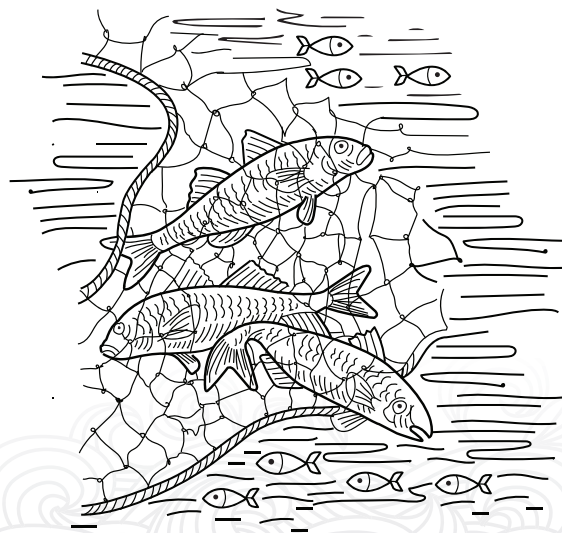
WISE USE

“For us, protection of environment is an article of faith. We have natural resources because our previous generations protected these resources. We must do the same for our future generations “

~ Hon'ble Prime Minister Sh. Narendra Modi



The concept of wise use of wetlands is described by the Ramsar Convention as the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development. Modern conventional approaches of wetland protection have been found to sometimes result in conflicts with livelihood needs of the communities.





Traditional bamboo mat fishing in Dang, Gujarat

© Jenis Patel/ Wikimedia Commons

Historically, the pattern has been one of progressive wetland loss, especially when a wide range of other land uses compete for wetland area. Ensuring continued maintenance of traditional linkages between human communities and ecosystem functioning can greatly further the cause of wetland management. In recent times, the case for wetland conservation is made in terms of maintenance of ecosystem functioning, which results in a wide range of values including groundwater recharge and discharge, flood flow alteration, sediment stabilization, water quality, food chain support, wildlife habitat, fisheries and heritage.

On the other hand, landscape approaches and mainstreaming traditional agricultural and fishing practices can support and sustain healthy wetlands. Such approaches are often found in the Traditional Knowledge based on the symbiotic association between nature and humans. The principle of Wise Use is an ode to this association.

Screw pine or Kewda is commonly seen along the coast



© Care Earth Trust



The real importance of these is demonstrated by the ecological and environmental costs which arise when wetland ecosystems are disrupted or lost. Traditional uses of wetland products serve as examples of wise use of resources and sustainable practices. The uncoupling of traditional wise uses from the wetlands can lead to a loss of both the wetlands, as well as cultural heritage.

In India, the concept of wise use is built into traditional use of wetlands. Wetlands managed as common property resources have community norms that regulate the extraction of resources, ensuring that no resource is over-exploited. This extraction of resources is also based on an understanding of the landscape, seasons, and local biodiversity.

In the East Godavari coast, home to the Coringa Sanctuary and rich mangroves along the estuaries, the bark of *Ceriops decandra* is used to create a dye. Boiling this bark leads to a red coloured dye which is then applied on fishing nets to prevent decay and extend its durability. This practice is undertaken once or twice a month for all nets. The Ganjam district in Odisha is responsible for 95% of India's total production of the aromatic *kewda*. Locally known as *kewda* or *kia*, screw pine is a dominant plant species of coastal vegetation. The male inflorescence of the plant supports the local economy and livelihood of people of Ganjam by providing the raw material for small-scale aromatics industries.

In Kashmir, the community of Panzath Nag sets aside a day during the annual fruit blossom festival to clean the village's spring. The day is meant for the community to gather, desilt and de-weed the spring, followed by fishing. Punjab's Keshopur-Miani Community Reserve, India's first community reserve, is a composite of freshwater marshes. The wetland is critical for sustaining biodiversity and supporting local livelihoods, from wheat farming and fish cultivation to commercial cultivation, of lotus and chestnut.



A Tank, A Temple and A Slice of History

Maduranthakam tank lies in the district of Chengalpattu, to the south of Chennai. The tank is also known as ‘Eri Kaatha Ramar’ (Tank guarded by Ram) and the associated temple is dedicated to *Kodbandarama*.

An underground tunnel (*surangam*) connects the Maduranthakam tank to the temple’s tank (*kovil kulam*). The staircase leading to the tunnel is used as an indicator of water level – water up to the second step of the staircase implies that the temple tank is full.

Legend has it that the tank was known to overflow during monsoons, causing flooding in the surrounding areas. In 18th Century, Lionel Blaze, the then District collector, got engaged in the work of strengthening the tank bunds to limit the flooding in the surrounding areas that occurred when the tank overflowed in the monsoon. Meanwhile, the

▶ **Maduranthakam Temple in Tamil Nadu
has a fascinating history to tell**

© Care Earth Trust



local community collected stones for building a shrine for *Seetha*, worshipped as *Janakavalli*, however work came to a halt due to a lack of funds. Collector Blaze felt that building a shrine was a wasteful use of public money. He however challenged the community, that if their deity can protect them from floods during monsoons, he will build the shrine out of his own pocket. That very year, as the tank was filling up due to heavy rains, locals were surprised to find a very overwhelmed Colonel kneeling on the bund; he had a vision of two youth standing on the bund, guarding the tank with their bows and arrows. After this, the rains stopped and with it, the risk of flooding. The Colonel kept his promise by building a shrine for *Janakavalli*, an event which is inscribed in the temple walls in Tamil and Telugu.

Today, the tank also sustains multiple livelihoods. A set of families residing nearby practice small-scale fishing for sustenance and limited market sales. In addition to this, when a part of the tank is leased for fishing, the families are then employed by the lessee. A family that resides near the tank embankment, collects and sells lotuses collected from Maduranthakam. Each part of the collected lotus plant is utilised. While the flowers are sold to the temples nearby and to markets in Chennai, the tubers are sold for their medicinal value. The stalk is then



▶ Legend of the 'Eri Kaatha Ramar' painted on the temple wall

© Care Earth Trust

dried to extract the fibrous threads which are then tied together to prepare wicks for the lamps in the temple.

Such stories of wetlands, their biodiversity and their cultural associations are extensively present. About 2 km away from the Maduranthakam temple is the Thiruvencateswarar Temple. The area used to be populated with trees of White Bauhinia (*Bauhinia acuminata*), with white flowers on which *kokku*, white wetland birds, used to perch. This white appearance led to the name Venkadu and the deity's name Venkateswarar or Suvedaaryanam. The tree is now the *sthala vruksham* (nominate tree) of the temple.

The Floating Phumdis

In Manipur, *Loktak Ima*, Mother Loktak, is considered by the Meitei people to be a spiritual mother who has nurtured the people over the ages.

There are many sacred sites within and around Loktak; many mythological ancestral deities adorn Loktak through their special rites and rituals. The sacred sites of *Heisnam Lairembi* on Thanga island, and *Yangon Ningthou* at *Lameidong*, (Yangon Maril is a water channel found within the Loktak Lake, a traditionally recognised feature); Bishenpur District at the northwestern rim of Loktak, *Ibudhou Thangjing* at Moirang (western rim of Loktak), and *Oknarel Hanuba* at Ningthoukhong (north-western rim) are some examples. *Umang Lai* (sacred groves or forest deities) are worshipped in villages surrounding Loktak.

Loktak pat is unique since it is the home of *phumdis* - floating mats of soil, vegetation and biomass. The largest congregation of phumdis is in the Keibul Lamjao National Park, home to the dancing Sangai Deer.

▶ **Phumdis in Loktak, Manipur**

© Shambhavi Krishna/GIZ



Sangai is Manipur's Brow-antlered Deer (*Rucervus eldi eldi*). According to one lore, a prince of *Luwang* clan of Manipur had transformed himself into a Sangai. Another from Loktak is the story of *Paubi Lai*. *Paubi Lai* was a giant python with dragon-like features who slept under Loktak. After ages of peaceful sleep, *Paubi Lai* was unfortunately woken up by noisy fishers. An angry *Paubi Lai*, after eating the fishers, proceeded to attack the Moirang Kingdom and had to be placated with sacrifices. A young man, Chauhi Leirong Apanba, with the help of a shaman, Kabui Salang Baji, decided to take on *Paubi Lai*. The shaman transformed an aquatic weed into a magical spear with which *Paubi Lai* was vanquished. Such tales offer a glimpse into the might and magic of Loktak.

This Ramsar site, with its immense cultural values, is also a livelihood lifeline for communities living around it. Communities practice fishing, farming, and collection of aquatic plants. The indigenous fishing community possesses a wonderful and rich repertoire of knowledge and skills for the wise use of the Loktak. The traditional indigenous fishing technique of *phum namba* (literally, phum pressing) is applied using *athaphum* (enclosures of phumdi strips arranged in circles) as the primary foundation of fish breeding and trapping. This ancient fishing technique is performed with ritual, song and gender sensitive participation. The cultural heritage of the indigenous Meitei fisher communities is captured in oral literature, customary laws, cultural practices including beliefs and ballads, and performances. spiritual rituals, songs or



Fishing in Loktak, Manipur
© Shambhavi Krishna/ GIZ





**Excerpt from Loktak Mapanda
(On the banks of Loktak)**

Today new ripple break dancing

On the surging stream in my life.

In the mere of my thought, high waves with crests

Surge into my mind.

Such a sight of the shining Meitei Lake

These eyes have been blessed with

This is Loktak, our Loktak that stretches

Glittering before us, Meitei Lake

- Khwairakpam Chaoba Singh

Surviving the Rann: Ingenious Systems in Exceptional Landscapes

South of the Thar Desert lies a vast expanse that functions both as a wetland and a desert. The Rann of Kutch is spread across most of western Gujarat with some portions spilling into the Pakistani province of Sindh. Rivers such as the Luni and Banas originating at the Aravallis and those arising in Gujarat, drain into the salty marshes of the Rann. During the monsoons when the seasonal rivers swell, the area metamorphosises into an expansive wetland; and as the dry season begins and evaporation skyrockets, the region transforms into a desert. The mighty Rann is believed to have been once the shallow arm of the Arabian Sea and thousands of years of silt accumulation morphed it into the saline mudflat that it is today. The Rann is divided into two segments - the 'Great' and the 'Little' Rann. The Great Rann is a seasonal, white, salty stretch while the Little Rann is known for its grassland ecosystem and the wildlife it supports. Agariyas, the traditional salt farmers of Gujarat, harvest the salt from the extensive underground brine reserves found in select areas. Salt farmers scout for such patches and move into the Little Rann of Kutch soon after the water dries to set up their temporary homes in the salt pans, or 'agars'. The Little Rann is a saucer shaped landscape that fills up with water in the monsoon, leaving



elevated patches, locally known as *bets*, moist enough to support grass populations that feed the animals in the region. The Indian Wild Ass Sanctuary is located in the Little Rann.

The southern edge of the marshy salt flats is marked by the Banni grasslands. The word *banni* comes from the Hindi word *banai* or 'made' since this land has been formed from the sediments deposited by several rivers. Among the largest grassland ecosystems in the subcontinent, the Banni grassland is unparalleled, socially, culturally and ecologically. The grasslands are also home to over 40 species of grass and 275 species of birds.

The ephemeral wetlands that materialise post-monsoon are significant stops for migratory birds in the Palearctic ecozone. They provide critical foraging, resting and breeding grounds for thousands of flamingos and waterfowl. The shallow Chari-Dhand Wetland on the edge of the arid Banni grasslands lights up post monsoon, welcoming painted storks, spoonbills and flamingos in their mating plumage. The wetlands spill southward into the Gulf of Kutch during good monsoon years. The Gulf is home to Gujarat's only mangrove stretch and contributes a great deal to the area's faunal biodiversity. The Rann and its surroundings are full of instances of human-animal relationships. Semi nomadic pastoralists, the Maldharis, are part of the rich migratory pastoralism of the region. The rare breed of swimming camels, the Karai camels are found here. The camels are able to swim in shallow waters to reach the mangroves – their grazing spots. The nomads offer *kheer*, a preparation made with camel milk to *Bhed Mata* praying for a bountiful year for both camels and humans. According to one of the legends associated with Rabaris, it is believed that they were created to take care of the camels on Earth as the descendants of expert camel breeder 'Sambal', a minion of Lord Shiva. The Banni buffaloes, stars of the region, have been selectively bred to survive the stresses of low water and high heat and trained to graze the grasslands through the night in order to avoid day heat.



**Woman working in the salt pans
of the Rann of Kutch, Gujarat**

© Vinod Panicker

The region was once an important trade hub shaped by its multicultural influences and fluid boundaries. This has nurtured unique craft traditions over the years. The intricate and labour-intensive textile printing method *Ajrakh* is closely tied to the land and its water. Local folklore speaks of a time where the Rann was drained by the sweet Indus where rice cultivation and block printing traditions thrived. Semi-nomadic pastoralists, the Gadariya herders, were the biggest consumers of this fabric in the past. The *Ajrakh* craft serves as an excellent indicator of water quality; printing suffers if the water is contaminated, particularly with salts or iron.

Different communities have found ways to thrive in this demanding landscape, practising trades passed down to them through generations. Judicious use of resources has been an integral part of this culture that has helped sustain livestock and salt farming traditions of the region. In order to maintain established practices in the face of impending change, it is imperative that management policies take into account, the local ecology and hydrology, as well as the livelihood traditions embedded in generational knowledge and local wisdom.

Great Indian Bustard

© Kesavamurthy N/Wikimedia Commons



Pokkali Rice


The marshy Pokkali tracts, which fall within the Alapuzha, Ernakulam and Thrissur districts of Kerala, typify an ecosystem where salinity, acidity and submergence are the major issues. In this system, one season of paddy farming is alternated with a season of prawn culture. The prawn seedlings, which swim in from the sea and the backwaters after the rice harvest, feed on the leftovers of the harvested crop. The rice crop, which gets no other fertiliser or manure, draws nutrients from the prawns' excrement and other remnants.

Pokkali is one of the oldest varieties of rice in Kerala. It is also among the oldest known crops cultivated by organic farming methods in the world. The story of Pokkali begins with a great flood that washed the seeds of this prolific grain from the Western Ghats to the low-lying saline plains. There it evolved as a strong contender against the ravages of nature, to nurture the communities that lived harmoniously with nature. It is said that the Konkani speaking Kudumbi community may have brought the grain with them when they moved from present day Goa to Kerala. It is also interesting to note here that Pokkali is also grown in Sri Lanka. It may have reached Sri Lanka via the Buddhist missionaries or vice versa. The story of Pokkali is closely connected to the stories of communities, and migrations to and from Kerala.


In Malayalam Pokkali translates as 'the one who grows above all'. As its name suggests, Pokkali grass grows up to 6 feet in height and is extremely resilient. Pokkali is at the forefront of heirloom rice varieties of the world, not just because of the nutritional value and antiquity, but because the grain has withstood developmental and climatic changes.







FAITH &



SPIRITUALITY

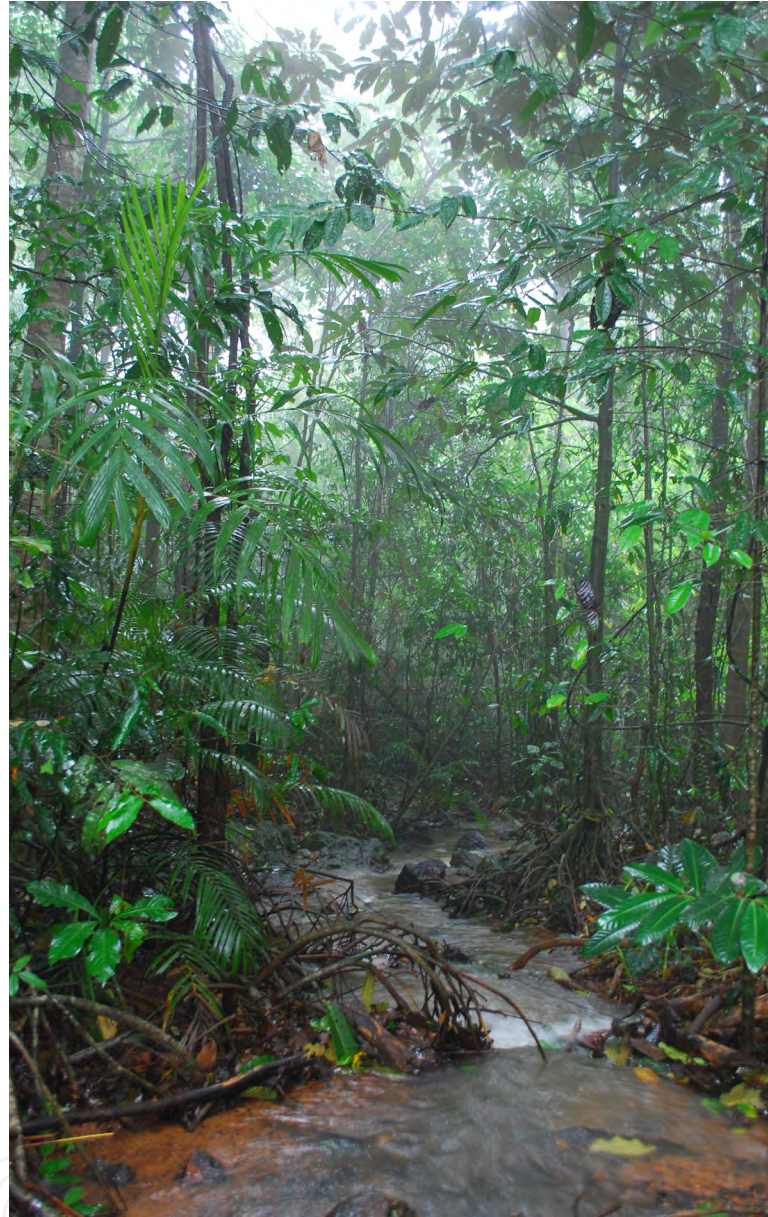
“Reverence for nature is part of our heritage. “

~ Hon'ble Prime Minister Sh. Narendra Modi

A profound—yet often intangible—connection with nature shapes faith and spirituality in traditional societies. Such connections have stemmed from historical, cultural and ritualistic significance attributed to natural resources, which helped sustain life through harsh climates and rugged landscapes. Stringent social etiquette and rules were put in place to ensure that the sanctity of the resource was maintained. These established norms are not only of spiritual significance but also hold high conservation value.

Among the natural resources, immense cultural value is conferred to waterbodies and wetlands, which often also serves as the cradle for traditional ecological knowledge across India. This can be attributed to the fact that water features predominantly in every momentous occasion in a person's life—from birth until death—in most societies. An example of this can be found in freshwater swamps of the Western Ghats. Every sacred swamp has a presiding deity like *Chowdi* associated with ponds and small lakes or *Jatka* or *Beerlu*, the guardians of sacred swamps bordering villages. The locals of Uttara Kannada district of Karnataka prioritise the ritual worship of *Vanadevate*, the Mother Goddess of the sacred swamps.

Myristica Swamps
©Aravinda Madhyasta





**Loktak, a Ramsar Wetland
in Manipur**

© Yaiphaba Akoijam/ GIZ

Wetlands also have a deep spiritual significance in Meitei mythology of Manipur. The famous *Nungjen Pukhri*, a pond located in Manipur's Kangla Palace is believed to be the abode of the primordial deity, Lord Pakhangba. *Lai Haraoba*, one of the prominent festivities of the Meitei people, is the celebration of the *Umang Lai* or deities of the sacred groves. Before the festivities commence, the spirit of the deity must be summoned from water by performing the *Lai-Ikouba* ritual. Gold and silver coins along with rice are thrown into the designated pond, and the *Laiching-jagoi*, a dance to summon the deity, is performed by a *maibi* (high priestess) as another *maibi* chants the hymns of creation.

While such attachment of the indigenous communities to their biophysical environment manifested itself in the form of ancestor and spirit worship, mainstream religions took to installing temples, engraving imagery from mythology, and putting in place, spirited rituals to display their reverence. Some examples of this can be seen from Rajasthan. The Nawal Sagar wetland in Bundi, Rajasthan, houses a temple dedicated to Lord Varuna, the Vedic God of water, whose *garbhagriha* (sanctum sanctorum) goes underwater when the lake fills with rainwater. Moreover, stepped ponds, usually smaller ones like the *jhalras* and *kundas* of Rajasthan, are located near places of worship. Larger stepwells such as *Bavdi* and *Vav*, even if not in the vicinity of temples, have inbuilt shrines and sacred imagery carved in the ornately crafted walls. Sculptures of Gods, Demi-Gods, flora, and fauna adorn the pillars and walls of the Rani ki Vav in Patan, Gujarat, a UNESCO World Heritage Site. Elaborately carved female deities are located along the corridor as a basal frieze at the *Rani ki Vav*, the very personification of the seven most sacred rivers in India - the Ganga, Yamuna, Godavari, Saraswathi, Narmada, Sindhu, and Kaveri. Smaller stepwells, locally known as *jhalras* in the city of Jodhpur have immense religious significance. Rituals and funerary rites are usually performed in the pavilions. One such, the Tunwarji ka Jhalra has an Islamic shrine in one of the square pavilions. Locals believe the spring water at the stepwell in Khedamata Temple in Neemuch is believed to have healing properties, capable of treating skin diseases and paralysis.

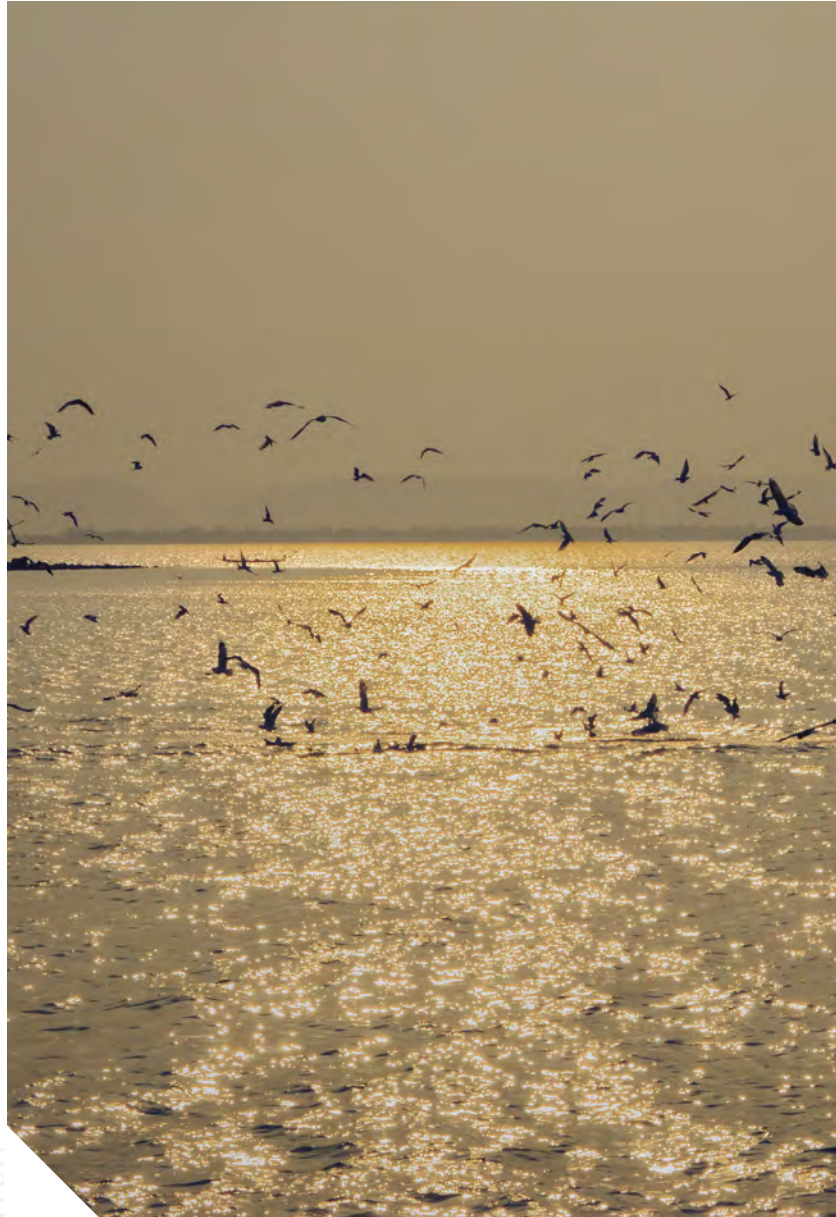




In Tamil Nadu, it is believed that *amrit*, the celestial pot of nectar, shattered and the nectar spilled onto the earth around the Mahamaham tank, which is situated in Kumbakonam in the Thanjavur district. The tank houses 20 holy wells or *theerthams* named after holy rivers and is surrounded by 16 small *mandapams* or shrines dedicated to Lord Shiva. People believe the holy water of the tank can rid them of their accumulated sins. Legend has it that sacred rivers of India bathe in the Mahamaham tank once every 12 years to purge the sins of humanity concentrated in their waters. This event is celebrated as the Mahamaham festival, during which thousands of people visit the holy tank as it is believed that bathing in the tank during the festival is equivalent to bathing in all the holy rivers.

In the mountainous state of Uttarakhand, water is perceived as a divine manifestation of the Supreme. Life-sustaining springs are revered in the Garhwal Himalayas. Symbolism and rituals relating to springs and water are conspicuous in people's individual and communal lives. Newlyweds receive a customary gift of five copper vessels - *panch bandii* - that will be used by them to retrieve spring water for the household. Moreover, the village spring source is the first place a newlywed bride visits in her husband's village. A symbolic ritual of pouring water from a copper vessel is performed by the bride at the spring source before she enters her new home.

Communities across regions pay obeisance in their own unique way in a land where wetlands are sacred, and rivers are Gods.



Chilika Lagoon, Odisha

© Suddhabrata Chakraborty/GIZ



The Lagoon Goddess and the Estuarine Curd Seller



With 52 rivers and rivulets draining into the lagoon, Chilika is constantly transforming. The water spread area increases from 900 sq.km in summer to 1165 sq. km in monsoons, during which the salinity of the lake also changes.

Chilika is many things - it is the country's largest brackish water lagoon with estuarine character; it is home to the endangered Irrawaddy Dolphin; it is an important source of livelihoods; it is one of the larger wintering grounds for local and transboundary migratory birds. It is also India's first Ramsar Site, declared in 1981.

It is, then, hardly surprising that Chilika is intrinsically woven into the culture and lore of Odisha. One such lore involves Manikapatna, a small estuarine village that is named after Manika, a curd-seller. Legend has it that Lord Jagannath and his brother Balabhadra once set off on a journey together. They stopped on the way to buy curd from Manika and gave her a coin in return. Meanwhile, the reigning king of Puri is said to have waged a war against the southern kingdom of Vijayanagara, and that he sought the blessings of Lord Jagannath before the war.

As the king started to the south with his army, he came across the coin given to Manika and surmised that the Gods had given him their blessings to win the war, and the town was, then, named Manikapatna or the village of Manika.

Another legend is associated with Kalijai, an island on Chilika lake, which is of immense importance to the local community, particularly the fishing community, with fairs and festivities organized during Makar Sankranti every year. The origin of the legend of Kalijai and its temple varies. A well-known version traces its origin to a poem by Godavarish Mishra, which narrates the story of Jai, a young girl, and her father who were travelling by a boat to visit her husband's family in Parikud. During this journey, a disaster struck in the form of a cyclone and the only survivors were Jai's father and the boatman. The point where the boat capsized is believed to be the place where the island exists, and locals began worshipping it as Kalijai in the temple.

Another lesser-known legend about the origin of the island speaks of war and avian deception. After reaching the shore of Chilika, the King of Khurdha was preparing to attack Parikud. However, he decided to call off the attack after he spotted a large army on the opposite shore of the lake. Interestingly, what he assumed to be an army, turned out to be a large flock of birds (the bird species, sadly, remain a mystery), thus leading to the name of Kalijai symbolising victory.

Kalijai Island in Chilka, Odisha

© CDA





“Bhala Kari Naa Bahare Nauri!

Jhiaku Maduchhi dara,

Gade Gada loke chahin Basithibe

Jhia Jib Sasughar “

“Chilika panire doluchhi lahari

Bahuchhi seetal baa,

Sori khara Jali jauchhi lo

Kheluchhi sahasra Naa?”

- Godavarish Mishra

Mother and Son Reunite at Himalayas

Declared a Ramsar site in 2005, Renuka Lake is situated in the Sirmour district of Himachal Pradesh. It is a 20-hectare wetland fed by rainwater run-off and several active springs. Water from Renuka flows into a smaller lake known as *Parashuram Tal* through a small channel. Renuka and its surrounding forests, which were designated as a Wildlife Sanctuary in 1964, support a rich assemblage of about 400 species of flora and fauna.

The lake borrows its name from Renuka, the wife of Jamadagni and mother of sage Parashuram. It is believed that the lake came into existence when Renuka—to avoid being abducted by a king—jumped into a small pool of water, which then transformed into a large lake in the shape of a woman. Parashuram, infamous for his anger, avenged her death. It is alleged that he reunites with his mother at Renuka Lake every year; an annual fair is organised in November to celebrate this reunion. In addition to the November festivities, three major local festivals are celebrated – Maghi Sankranti in January, Boshho Sankranti in April, and Haryali in August.



Renuka Temple (L) and Fair (R)
in Himachal Pradesh

© Jobless Studio/ GIZ



Renuka Lake has emerged as an important source for sustaining the livelihoods of local communities by generating income sources such as tourism opportunities like boating, and adventure sports along with shops in Ashram and temple premises. In addition, the annual fair, which has grown in popularity in the recent times, attracts lakhs of visitors including pilgrims from other states, thereby contributing towards additional earnings for the locals (from food and lodging as well as shops and odd jobs during the fair).



The Queen of the Sundarbans

Located in the combined deltas of the Ganga, Brahmaputra, and Meghna Rivers, the Sundarbans—a UNESCO World Heritage Site and Biosphere Reserve—is one of the largest mangrove forests in the world. The Sundarbans ecoregion is not uniform, and depending on the location and geography, it can be a combination of freshwater swamps, brackish swamp forests, and mangrove forests. Spread across India and Bangladesh, the Sundarbans mangroves are ecologically and culturally complex. A composite of tidal waterways, mudflats, islands, and salt-tolerant mangrove species, the wetland is a veritable mosaic of abundance. *Ma Bonbibi* is believed to be the presiding queen of the forest. The *Bonobibir Johuranama*, a literary compilation of texts, describes *Bonbibi's* struggle with *Dakshin Rai* (or the Southern King), who rules over beasts and demons.

▶ Bonobibi Temple, West Bengal

© Pinakpani Biswas/
Wikimedia Commons



He is revered as a Forest God and a shapeshifter who is believed to assume the shape of a tiger prowling through the mangrove. The *Johuranama* is widely read and performed in the Sundarbans. It is a legacy that is shared by Hindu and Muslim devotees of *Bonbibi* who seek her blessings and protection as they navigate the dense mangroves as honey collectors or fishers. The Dakshin Rai–Bonbibi imagery is a common sight in the landscape. Most of the shrines dedicated to Bonbibi are open, with no doors, making them more accessible to the public. The Bonbibi festival is held once a year in January or February, in which she is celebrated by all her devotees.

The tradition of Bonbibi worship also serves as a critical means to ensure communities respect the ecosystem and regulate resource extraction in a thriving, yet inhospitable environment. The norms are very clearly laid out—entry in the forest is allowed only during certain hours and night-entry is prohibited to avoid disturbing the wildlife; fishing is forbidden during breeding season; smoking and drinking are strictly banned and carrying arms into the sacred forests is forbidden. In addition, no one working in the jungle can enter without the instructions or presence of the *baulis* or tiger charmers. Baulis derive their authority directly from Bonbibi and are believed to have powers that can protect people from tigers.



Bonbibi Johuranama

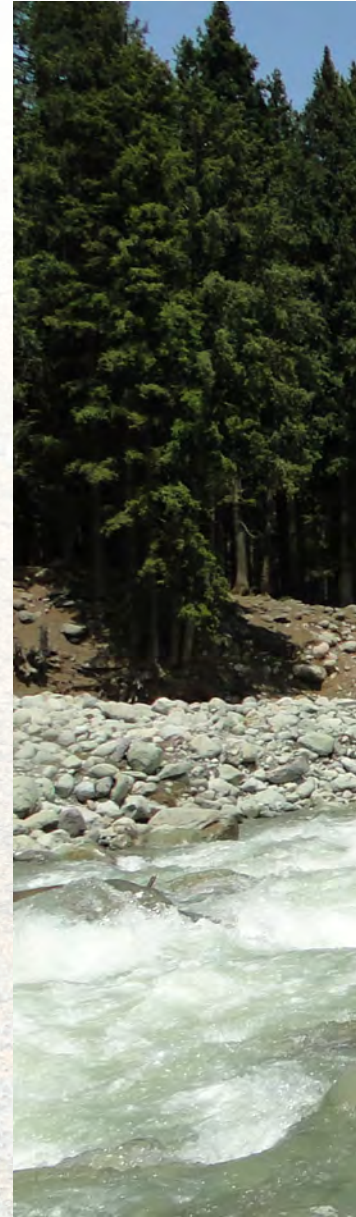
*Bipod e poriya bon e jeijon e
daak e, Ma boliya Bonbibi
doya r maa take... Uddhariye
taro torey aponaro gun e,
Maaer o hujura koto likhibo
ekhane ...*

*[Facing any danger inside the
forest, whoever prays to Her,
Mother Bonbibi
protects them all.]*

The Tasruafdars of Kashmir

Kashmiris deeply revere springs. Kashmiri Muslim folklore and collective memory speak of a fascinating character—the *Tasruafdars* or elves who reside in the springs. This lore draws significant parallel with the Hindu folklore of *Nagas*. It is believed that *Tasruafdars* dwell around streams, rivers, and patches of wilderness, particularly those associated with poplars and chinars at night. In ancient times, springs occupied by *Tasruafdars* were often used as oracles. For this, farmers would fill clay pots with rice, seal them, write their name on the pots, and throw them into the springs. When the pots floated back to the water surface, their contents were checked; if the rice was warm and smelt nice, it meant a prosperous rice harvest. If the pots were filled with mud, it meant bad luck and crop failure. Another method involved cutting a nut into four pieces and throwing them into the spring. If an even number of pieces floated up, it was a good omen.

These lores meant that the people looked after spring sources and kept from polluting them because otherwise, the *Tasruafdars* would be very displeased if something were to happen to the pristine water source, enough to cause a spell of bad luck for the polluters.




River stream near Doodhpathri, Jammu & Kashmir

© Ankur Panchbudhe/Wikimedia Commons







TRADITIONAL KNOWLEDGE

“Respect for nature is an integral part of our culture, and has been passed across generations. Protection of environment comes naturally to us.”

~ Hon'ble Prime Minister Sh. Narendra Modi



Throughout human history, traditional knowledge systems have been developed by indigenous communities to understand and interpret their biophysical environment. These knowledge systems to manage the environment, constitute an integral part of the cultural identity and social integrity of many communities. They also document a wealth of wisdom and experience of Nature gained over millennia from direct observations and transmitted—most often orally—over generations.

► **Terraced paddy fields in Ziro, Arunachal Pradesh**
© Ashwani Kumar/Wikimedia Commons

The significance of traditional knowledge for the conservation of biodiversity and the achievement of sustainable development is globally recognised. Traditional societies take pride in preserving their cultural and environmental stability over maximising production. Consequently, there is no ‘exploitation’ of nature, which is considered as a home, a deity, a giver rather than a collection of commodities. This way of life is based on a strong sense of interconnection and interdependence with nature and obligation to the other community members. Natural resource management is based on shared meanings and knowledge and a strong symbolic dimension in which every action is highly ritualised.

The manifestation of traditional knowledge is also varied. In some cases, it takes the form of water management and customary roles for practising agriculture. The diversion of water to create partially flooded lands for agriculture is seen across India - from the *Apatani* wet cultivation of Arunachal Pradesh to *Khazan* lands of Goa, to *Ahar-Pyne* of Bihar and the *Kattas* and *Madakas* in Karnataka. These traditional structures were constructed every year to conserve water for irrigation as well as other purposes and made use of local landscape and seasonality.

Baori, *Baoli*, *Bavdi*, *Vav*, *Vapi*, *Vavi*, *Pushkarani*, *Kalyani* - Names and landscapes vary, but construction philosophy remains consistent. Construction of subterranean stepwells, or ‘inverted temples’ as they’re referred to, was considered a sacred act in desert regions.



Chand Baoli, Rajasthan

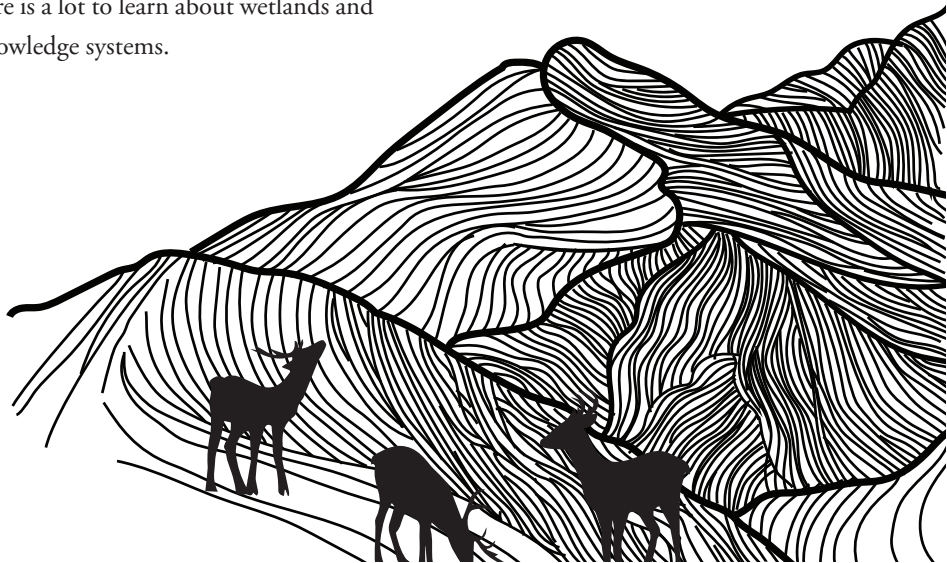
© Chethan/Wikimedia Commons



Stepwells served as wet pockets dominating the cultural and physical landscape in India's predominantly arid Western region, cushioning communities from fluctuations in water availability.

Traditional knowledge also manifests in the form of early warning systems. In the temple tank of the Thirupudaimaruthur temple in Tirunelveli, one can notice the figurine of a monkey bowed down as if to drink water. The monkey is a flood indicator – if the water level reaches the monkey's mouth, it indicates a flooding event.

Our difficulty in approaching the knowledge from indigenous cultures is reflected in the way in which we describe and name it. No universal definition is available, and many terms are used to establish what indigenous people know, including traditional knowledge or traditional ecological knowledge, local knowledge, indigenous knowledge or science, folk knowledge, farmers' knowledge, fishers' knowledge and tacit knowledge. Each of these terms carries different implications, and there is an ensuing discussion about which one is the most appropriate. While the word 'traditional', for example, places the emphasis on the transmission of knowledge along a cultural continuity, the word 'indigenous' is meant to highlight the native nature of this knowledge, and 'local' can be applied to different geographic contexts. At present, traditional ecological knowledge is interpreted as a cumulative body of knowledge, practices and representations, that describes the relationships of living beings with one another and with their physical environment, that evolved by adaptive processes and has been handed down through generations via cultural transmission. There is a lot to learn about wetlands and their management through traditional knowledge systems.



Khadeens of Jaisalmer

The amber sands of the Thar Desert might seem deprived, incapable of sustaining life. Paradoxically, the Thar is one of the most heavily populated desert regions in the world. How did this come to be?

Since the 15th century, astute communities in Jaisalmer's arid desert region have practised a simple scientific method of harvesting the already scarce rain. While rains may be scarce in the desert, they most often are torrential, occurring in short, but fiercely intense spells. Falling rain would slowly flow down a barely perceptible slope through the farmland. An earthen embankment is built across the slope to catch the run-off, no matter how little, and retain the water in the farmland. Once the rains come, for about two months the soil slowly takes in the water and stays saturated long enough to raise one or two crops. Thus is the magic of the *Khadeen*, the flooded farmland. All the water that would otherwise be lost as run-off is now captured by the expansive Khadeens.

Khadeens are highly site-specific and cannot be replicated across the desert. The catchment is as important as the wetlands that lay flooded. Khadeens are heavily dependent on an upstream catchment that is coarse and gravelly with a high run-off potential. The soil profile is rather unique.

▶ **A khadeen in Rajasthan,
glistening in the hot sun**

© Seetha Gopalakrishnan/
India Water Portal



Hidden to the human eye, a layer of gypsum underground prevents the sweet water that permeates through the soil from mixing with the salty water underneath. In addition to bringing in water, fine silt also enters the farmland making them more fertile than non-*khadeen* lands in the vicinity. Large *khadeens* are usually community owned where every household, regardless of the caste, has a stake in farming operations and a share of the produce. Millets are the preferred crop. Pearl millet (*bajra*), sorghum (*jowar*) and cluster beans (*gavar*) are favoured the most. Pulses and oilseeds are also cultivated as mixed crops in some areas.

Systems of harvesting water in an exacting topography such as the *Thar* was born out of decades of observation and years of design refinement. By virtue of being grounded in local knowledge, these traditions continue to be relevant even today, sustaining lives and livelihoods in the sepia landscape.



Nanguneri Tank, Tamil Nadu
© Anjana Vencatesan / Care Earth Trust



Traditional Water Management in Thirunelveli

The district of Tirunelveli in Tamil Nadu is home to some of the most ingenious traditional water management practices. The Thamirabarani, the sole perennial river of the state runs through Tirunelveli, and as a result the irrigation system has been meticulously developed over centuries by systematically taking river waters into areas that are devoid of year-long irrigation, done through the construction of masonry water diverting structures or Anicuts (*anaicuts* in Tamil). Another characteristic of the district is its network of wetlands. These wetlands serve as important stopover sites for migratory birds and are also part of the local cultural traditions and practices. Some of these are in the form of prominent temple tanks and serve as important water indicators – Nanguneri tank is one such.

Nanguneri is a taluk in Tirunelveli district and well-known for its Vanamamalai Perumal temple, making it an important tourism centre.

Its associated wetland is the Serthu Thamarai Kulam, also known as the *Nanguneri Eri* (Nanguneri Tank). While for some the name Nanguneri is a simple derivative of words to mean ‘a tank visible from all four directions’, the temple management tells the story of Lord Vishnu landing on Earth and a lake opening on all four sides of him, which became the Nanguneri tank. It is also the location of multiple examples of traditional knowledge on water. The Nanguneri tank is an important indicator of water levels. The local belief is that if the tank reaches full capacity, it implies a good rainfall year since 50 tanks must fill before Nanguneri. This belief is rooted in an understanding of local hydrology since Nanguneri indeed lies downstream of approximately 40 tanks.

Cascading tank systems of South India, particularly those in the water-starved regions of Tamil Nadu were born out of meticulous observation of topography and climate. Earthen embankments or *bunds* were raised to contain water in natural depressions which were later expanded to create massive wetlands that supported crop cultivation. The sluices that allowed water into agricultural fields were originally simple, open cuts with burnt clay pipes to direct flow. Later, an ingenious contraption was installed to regulate water flow. The *‘kumizhi thoombu’* used a plug rod to open and close the outlet to control the quantity and duration of outflow, bringing with it, the focus on sustainability and judicious use.

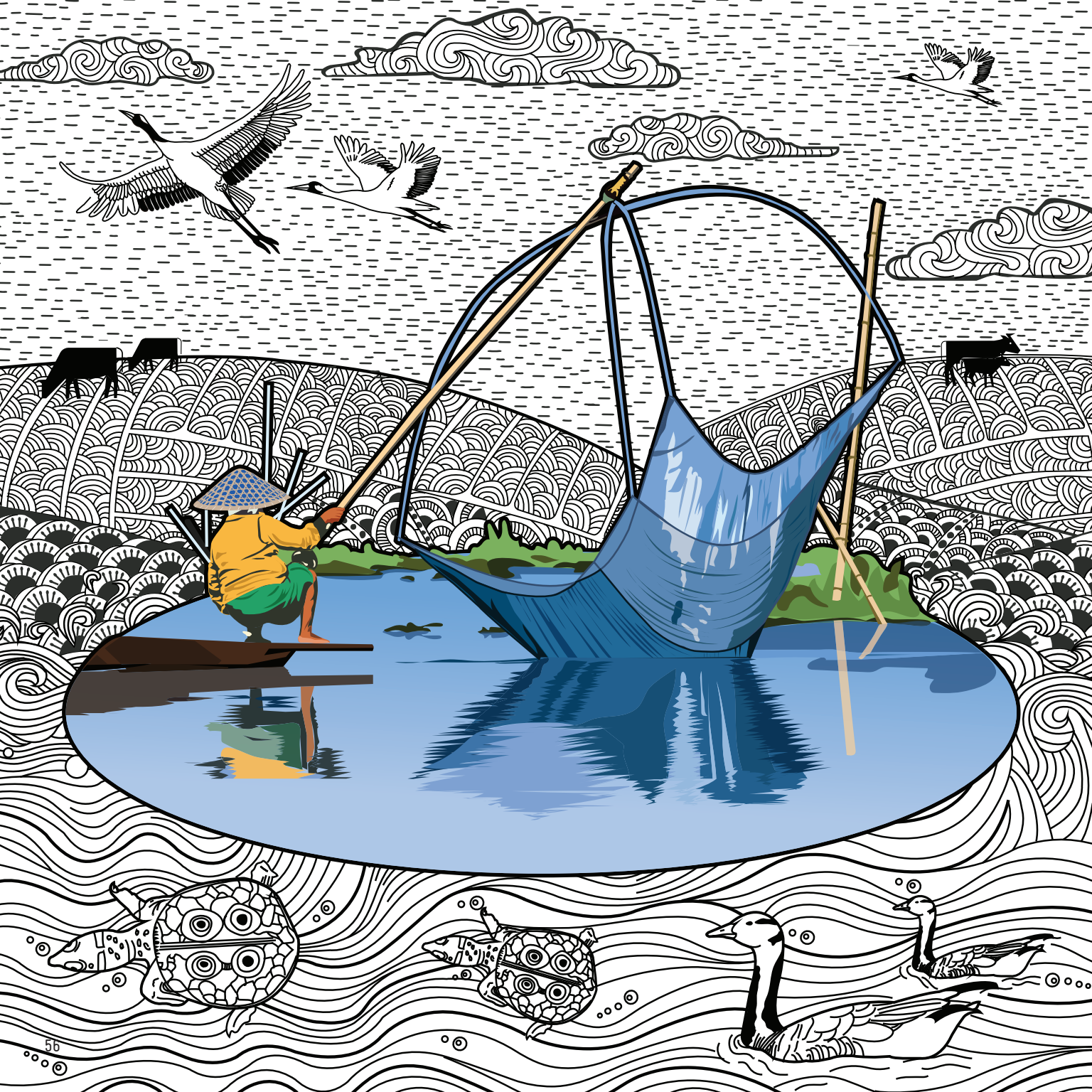


The Spirits That Spell a Landscape

Traditional knowledge of indigenous tribal communities manifests in various forms. It may take the form of harnessing the landscape for livelihoods, knowledge of flora and fauna, traditional engineering methods, and early warning systems for disaster management. A key component of traditional knowledge is also the detailed spatial awareness and knowledge of the landscape. This awareness manifests itself in multiple forms – one such example being supernatural spirits that are revered, worshipped, and placated.

In Northeast India, these spirits take various names and inhabit various landscape features of the forests. For the Kuki tribe, the Thilha spirits associated with water and springs are considered to be the most powerful, demanding the biggest sacrifices. Tuikhumnga are the demons of the streams and lakes, of whom Tuikhumlen is the king. The Tuivamit and the Tuivalha are spirits of various forms of springs whereas the Nomnoh and the Khukseko are spirits of the swamps. Spirits also define specific forms of trees based on their preferred residence. While the Thinggophel lives in a tree where the trunk separates and joins again to form a hole, the Thingjungkai resides in trees that have roots on both sides of a stream.







CONSERVATION

“Along with enriching biodiversity, they (wetlands) also ensure flood control and ground water recharge...the wetlands of India are also an example of our natural potential. “

~ Hon'ble Prime Minister Sh. Narendra Modi



Vedanthal Bird Sanctuary, Tamil Nadu

© Ashwin Kumar / Wikimedia Commons



Wetlands of India serve as important landscapes for the conservation of flora and fauna. The marsh jungles of Terai are home to the Swamp Deer in Uttar Pradesh and Uttarakhand. The wetlands of Tamil Nadu are important stopover sites for migratory birds, including those that fly from as far as Central Asia such as the Bar-headed Geese. Bhitarkanika is home to Saltwater Crocodiles while the Keibul Lamjao is a habitat for the dancing Sangai Deer. The cultural significance of wetlands often plays a crucial role in their conservation.



In Vedanthangal in Tamil Nadu, the villages surrounding the wetland bird sanctuary, now a Ramsar site, celebrate a quiet Diwali since it coincides with the bird migratory season. In the Dodital and Devariyatal lakes of Uttarakhand, traditional norms prohibit fishing. The temple pond of Kamakhya in Assam hosts five species of turtles. Of these the Black Softshell Turtle (*Nilssonia nigricans*) is listed as Extinct in the Wild by IUCN, making the temple pond an important conservation effort. Across the northeast, various temple ponds provide a safe habitat for turtles such as *Garakhia Gohair Than* and *Nagshankar* temple in Assam and the Rajbari pond in Tripura.

Today, wetlands are globally facing the threats of habitat loss and degradation, climate change, pollution, invasive species, overharvesting and disease. In some cases, specific interventions such as shrimp farming in coastal wetlands can lead to loss of mangroves, while in some areas, development of mudflat areas has been found to be detrimental to dependent shorebirds. Freshwater ecosystems stand to be affected by increased eutrophication, depleting water tables and more pollutants upstream. Another threat is the introduction of alien species, mainly fish and aquatic plants, which can result in a massive decline in the native species diversity and impact habitat structures, biogeochemical cycling and food webs.

In such a scenario, it is imperative to learn from and respect the cultural heritage values accorded to wetlands and their inhabitants all over the country. Conserving a wetland creates a ripple effect in conserving local biodiversity as well as in protecting livelihoods, traditional knowledge and cultural practices. And Indian examples of conservation through cultural practices can serve as a model for wetland conservation across the world.

Bar-headed Geese
© Yajphaba Akoijam/ GIZ



The Lu Presiding at High Altitudes

Spangs are grassy wetlands, which usually mark ground-water aquifers in Ladakhi villages. They are a central feature of Ladakh's customary agro-pastoral system of subsistence as they are often used for grazing livestock and also as sources of freshwater in winter when surface water is frozen. Many *spangs* in Ladakh are part natural and part manmade, as irrigation channels often feed into the aquifers underlying the spang. In parts of Chang Thang, a high altitude (>4000 masl) plateau, extensive *spangs* form the edges of rivers and high-altitude lakes, such as *tso moriri*. In these beautiful but desolate landscapes, where unlike the lower reaches of Ladakh, agriculture is not possible, *spangs* are the biodiversity hotspots, which nourish not only the livestock of the *chang pa* nomads but also several species of rare mammals, birds, and medicinal herbs.

▶ Agro-pastoral Practices in Spangs, Ladakh

© Kunal Bharat/GIZ

In many Buddhist villages, *spangs* are considered as powerful spots that are home to underground spirits called *Lu*, the masters of wetlands and springs. *Lubang*, a small square structure, is the dedicated altar for *Lu* found at wetlands, similar to relatively larger altars for protector spirits or gods *Lha* on mountains or higher reaches.



Keeping the *Lu* happy is thus a big part of the local Buddhist monastery's responsibility. In Buddhist villages where such *Lu* exist, the local monastery sends monks to conduct rituals to placate the *Lu* annually, or in case of special circumstances.

Taboos prohibit spitting or polluting the areas close to the shrines of the *Lu*, as this is believed to bring ill health to the polluter and the village. Similarly, water from springs close to a *Lu*'s shrine is often considered to have healing properties. This attracts hundreds of people for cures under the supervision of *Amchis* – the traditional medicine practitioner. The wetland pasture around hot springs of Puga in Changthang Rupshu recently had an elaborate ritualistic prayer after serious damage was caused to a roadside spring. Such reverence allows for the protection of spangs and the biodiversity supported by them.



▶ **The *Lu* ritual at Phyang, Ladakh**
© Kunal Bharat/GIZ

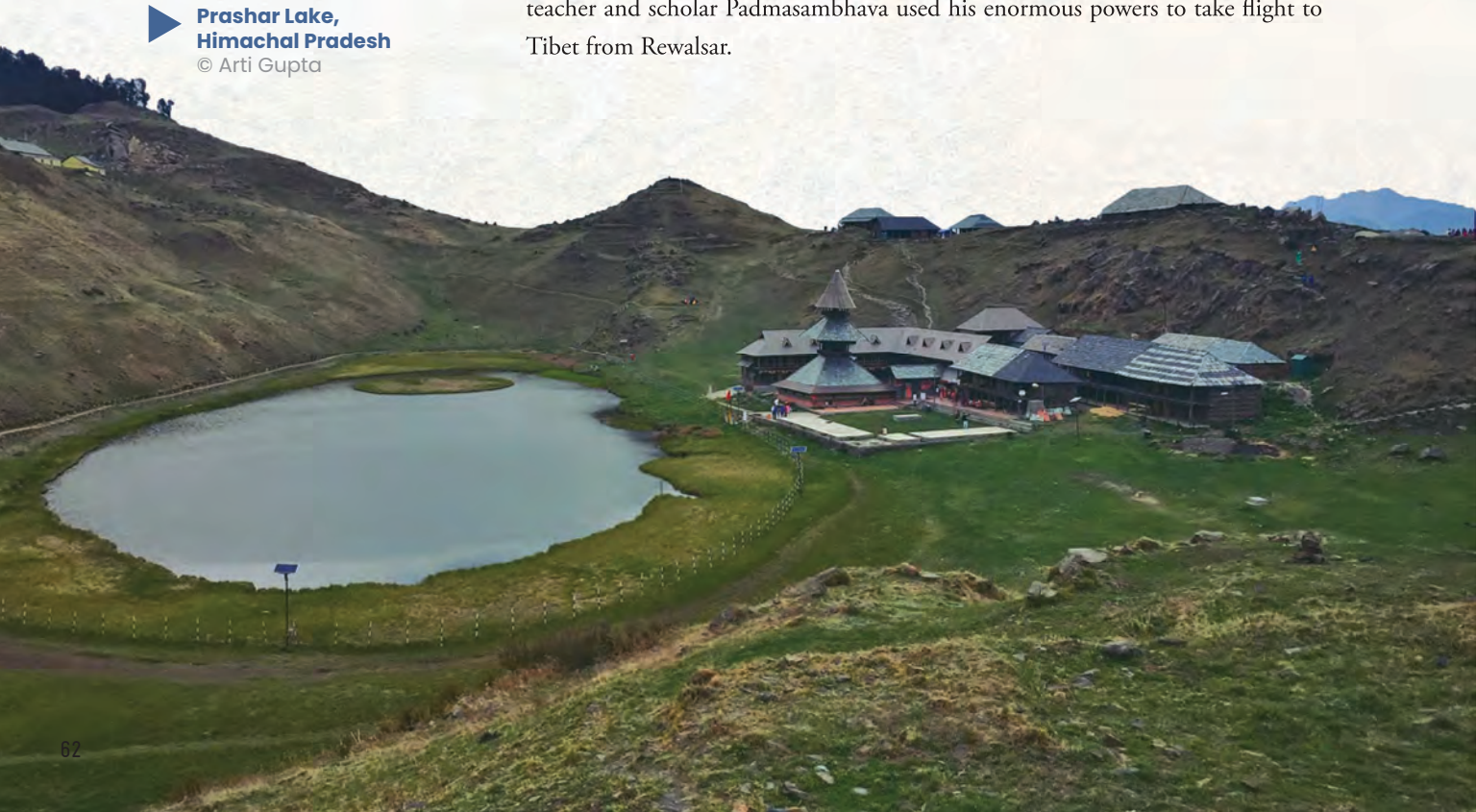
The Lakes of Mandi

The district of Mandi in Himachal Pradesh is home to wetlands that embody spirits in the form of floating reed islands.

The Prashar wetland is believed to be formed as a result of sage Prashar striking a *gurj* (mace), leading to water springing out and forming a lake. An ancient three storied Pagoda style temple dedicated to the Rishi Prashar, the patron God of Mandi region, stands beside the lake which was constructed by the King Ban Sen of Mandi in 13th and 14th century. Till date, the depth of the Prashar Lake remains unknown since local belief systems prevent people from measuring its depth.

Another lake in Mandi, Rewalsar, has many lores attached to it. It gets its name from Rishi Lomas who is believed to have performed his penance to appease God Shiva. Hindu, Buddhist and Sikh shrines exist along the periphery of the lake and during Baisakhi, it is visited by people of all religions. Legend has it that the great teacher and scholar Padmasambhava used his enormous powers to take flight to Tibet from Rewalsar.

▶ **Prashar Lake,
Himachal Pradesh**
© Arti Gupta





► **Rewalsar Lake, Himachal Pradesh**
© HIMCOSTE

One of the most fascinating aspects of Prashar and Rewalsar is the cultural importance associated with the floating islands therein. In Prashar, a floating grass island is constantly in motion around the lake. Local belief is that when the island stops moving, it would herald a time of catastrophe. Similarly, in Rewalsar, there are multiple tiny islands of floating reeds which are believed to be the result of a boon to Rishi Lomas by Shiva-Parvati. An alternative belief is that these tiny islands hold the spirit of Padmasambhava. Such multitude of tales which accord importance to the grasses and reeds are important since these plants are an integral part of these ecosystems as well as indicators of water quality and salinity.

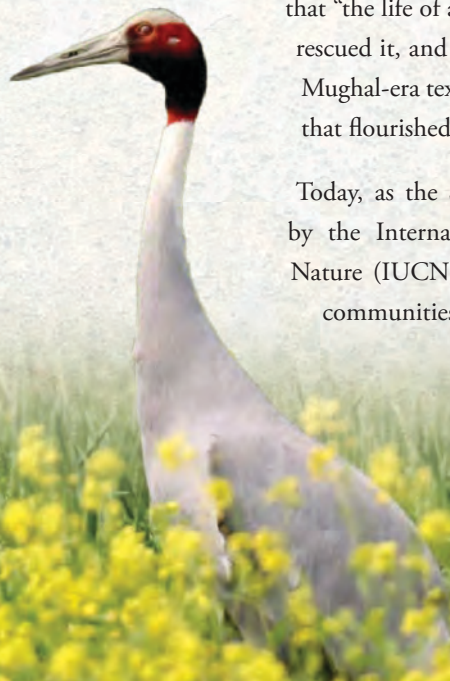
Kunt Bhayog is another lake located near Rewalsar. Some date the origin of this lake to the Pandavas of Mahabharata. It is believed that as the Pandavas were walking through this area, their mother Kunti felt thirsty. Unable to find a water source in the vicinity, her son and one of the Pandavas, Arjun pierced the Earth with an arrow causing a stream of water to emerge and form into a lake. It is also said that 6 more lakes and ponds were built by the Pandavas in the vicinity of Kunt Bhayog. These other lakes and ponds occasionally dry up in the absence of rains, but Kunt Bhayog lake is always brimming with water.

Symbolism of Sarus Crane

We often find that floral and faunal species assume a symbolic value that transports them into stories, arts and crafts. The Sarus Crane (*Antigone antigone*) is one such iconic symbol of Indian wetlands. It is found in a variety of habitats like small seasonal marshy areas, paddy fields, and floodplains. One of the largest flying birds, it is also an umbrella species for the conservation of wetlands in the Gangetic plain and the state bird of Uttar Pradesh. Its name is derived from Sanskrit, *sarasa* for “bird of the lake”. This bird which pairs for life, represents unconditional love, devotion and good fortune in Indian culture. There are several accounts of the bird in Indian texts. Legend has it that the poet Valmiki cursed a hunter for killing a Sarus Crane and was then motivated to write the epic Ramayana. Another tale is of the young Prince Siddhartha, before he became the Buddha. He found a white bird, believed to be a Sarus, injured by Devadutta’s poisonous

arrow. He nursed it to save its life. Devadatta wanted the bird for himself, but Siddhartha told him that “the life of an animal belongs to the person who rescued it, and not to the one who dispossessed it.” Mughal-era texts describe the behaviour of this bird that flourished in the Gangetic floodplains.

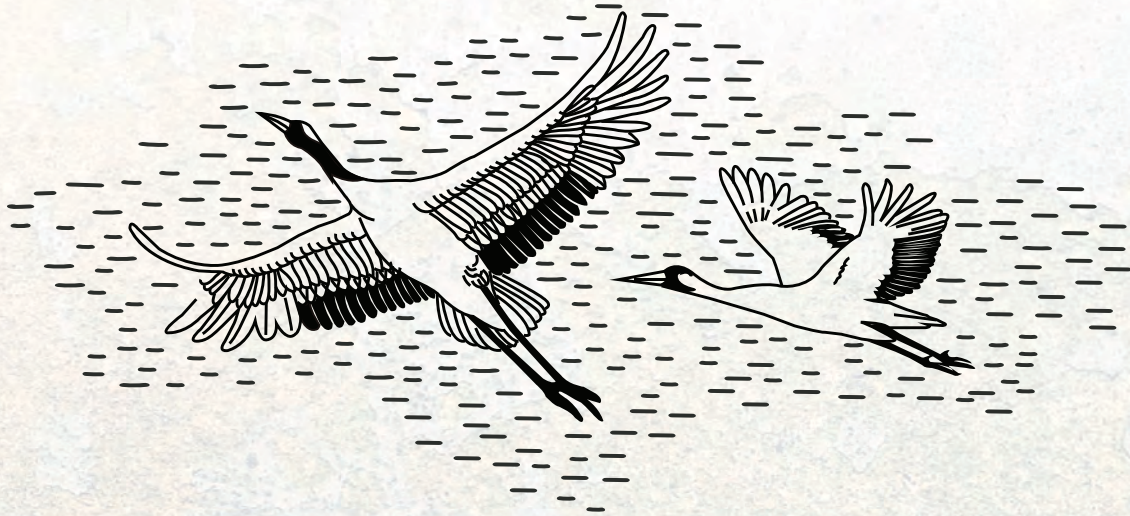
Today, as the Sarus Crane is classified Vulnerable by the International Union for Conservation of Nature (IUCN), it is heartening to note the local communities coming together to save this bird.



Sarus Crane

© Yaiphaba Akoijam/ GIZ

In May 2022, the people in Gujarat's Ganasar village became host to a Sarus Crane pair which had laid eggs in one of the farms. The village Sarpanch informed Mr. Desal Pagi, an avian conservationist working on Sarus Crane conservation who noted that the development was unusual – since the eggs had been laid in a scorching and dry month, rather than the usual July-August period. With the help of the farm owner and the villagers, they set to the task of converting the farm into a makeshift wetland, keeping it filled with water to a certain level, and avoiding machine farming near the eggs. The village got together to keep vigils to ensure the protection of the eggs all day and night, giving us all a much needed example of conservation optimism.



We hope this compilation of nature and culture linkages helped you appreciate our Amrit Dharohar, our wetlands. We urge you to explore the lessons rooted in our rich traditional heritage and embrace the conservation of wetlands.

*“We, the present generation,
have the responsibility to act as
a trustee of the rich natural
wealth for the future
generations.”*

~ Hon'ble Prime Minister Sh. Narendra Modi

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“We are blessed to be a part of a culture where living in complete harmony with the environment is central to our ethos.”

~ Hon'ble Prime Minister Sh. Narendra Modi