



# GOA'S KHAZANS

A UNIQUE GUARD AGAINST  
CLIMATE CHANGE

Project  
Implemented by



Supported by



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# WELCOME TO GOA!



Goa, located on India's western coast, has a 105-km-long coastline marked by headlands, rocky beaches, rock cliffs and isolated coves, as well as sandy beaches.

The state also has a coastal plain that has seven major and four minor tidal river systems, which are home to mangrove swamps, small islands, and marshlands.

Goa's water security, fisheries, tourism, and transportation sectors are highly dependent on the interplay of these systems.

# THE PICTURE PERFECT COAST OF GOA IS UNDER A HUGE THREAT OF CLIMATE CHANGE



CHANGES  
IN RAINFALL  
PATTERN



A white cloud with several blue raindrops falling from it.



SEA LEVEL RISE

# WHY WE NEED NATURE-BASED SOLUTIONS (NbS)

**The International Union for Conservation of Nature (IUCN)** describes NbS as “actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously benefiting people and nature”

**Living shorelines**, which are protected coastal edges made of natural materials like sand, rock and plants, build community resilience in various ways. Living shorelines and other NbS can help combat several challenges, including the impacts of climate change.



## IN COASTAL AREAS, ONE CAN PRACTICE DIFFERENT Nbs:

- Restoring and preserving mangrove forests and wetlands to protect against coastal erosion, storms, and tidal surges.



- **Introducing/ re-introducing salt-tolerant crops** that can grow in brackish water conditions or salt-affected land can help improve food security, while reducing the use of freshwater.
- **Integrating traditional ecological knowledge** into land management practices for maintaining soil fertility and water quality.



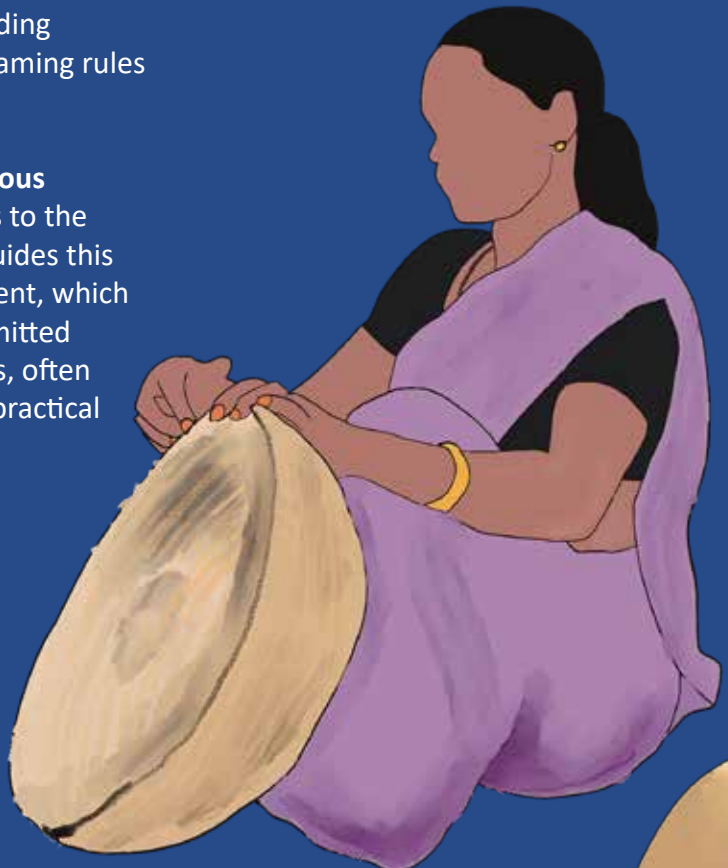
## A HERITAGE GOAN NbS:

# KHAZANS

Indigenous communities worldwide have managed **Common Property Resources (CPR)** sustainably for centuries. These communities combine biology and ecology with cultural, spiritual and social relationships, building institutions and framing rules accordingly.

The term '**Indigenous Knowledge**' refers to the knowledge that guides this type of management, which is culturally transmitted across generations, often orally or through practical demonstrations.

In Goa, occupational cooperatives whose lives are rooted in indigenous knowledge have partitioned, used, and managed the CPRs. One such CPR is the khazan.

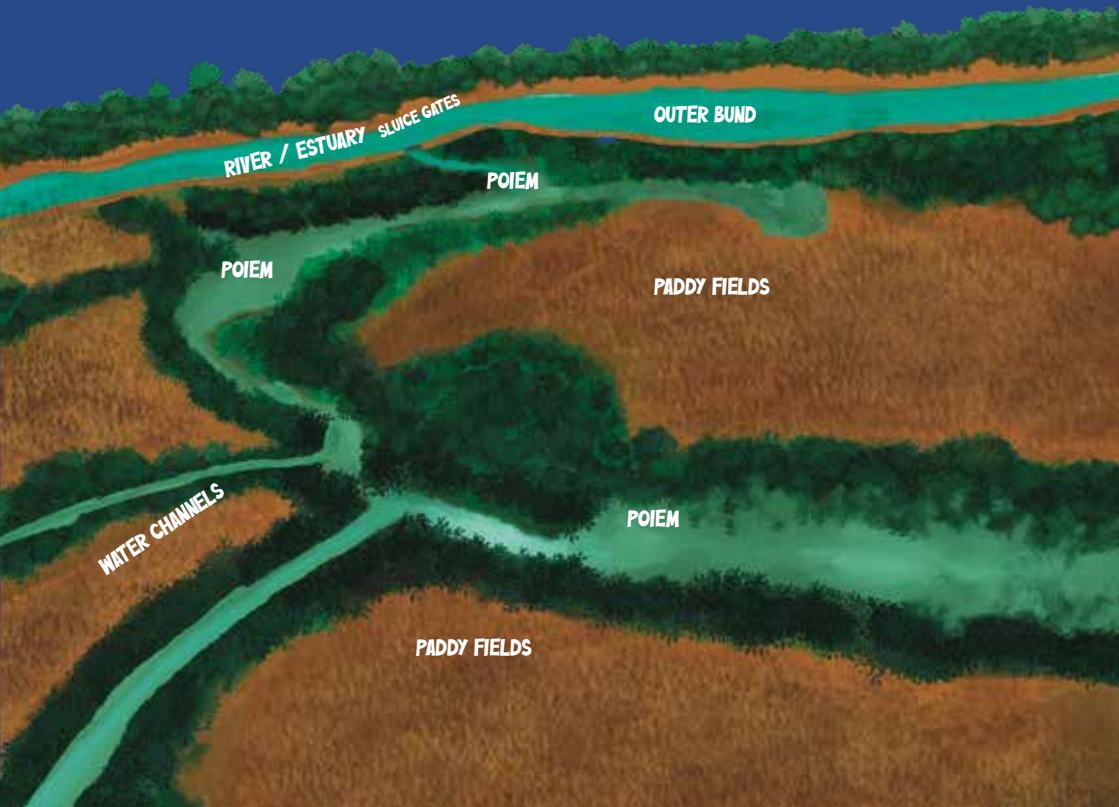




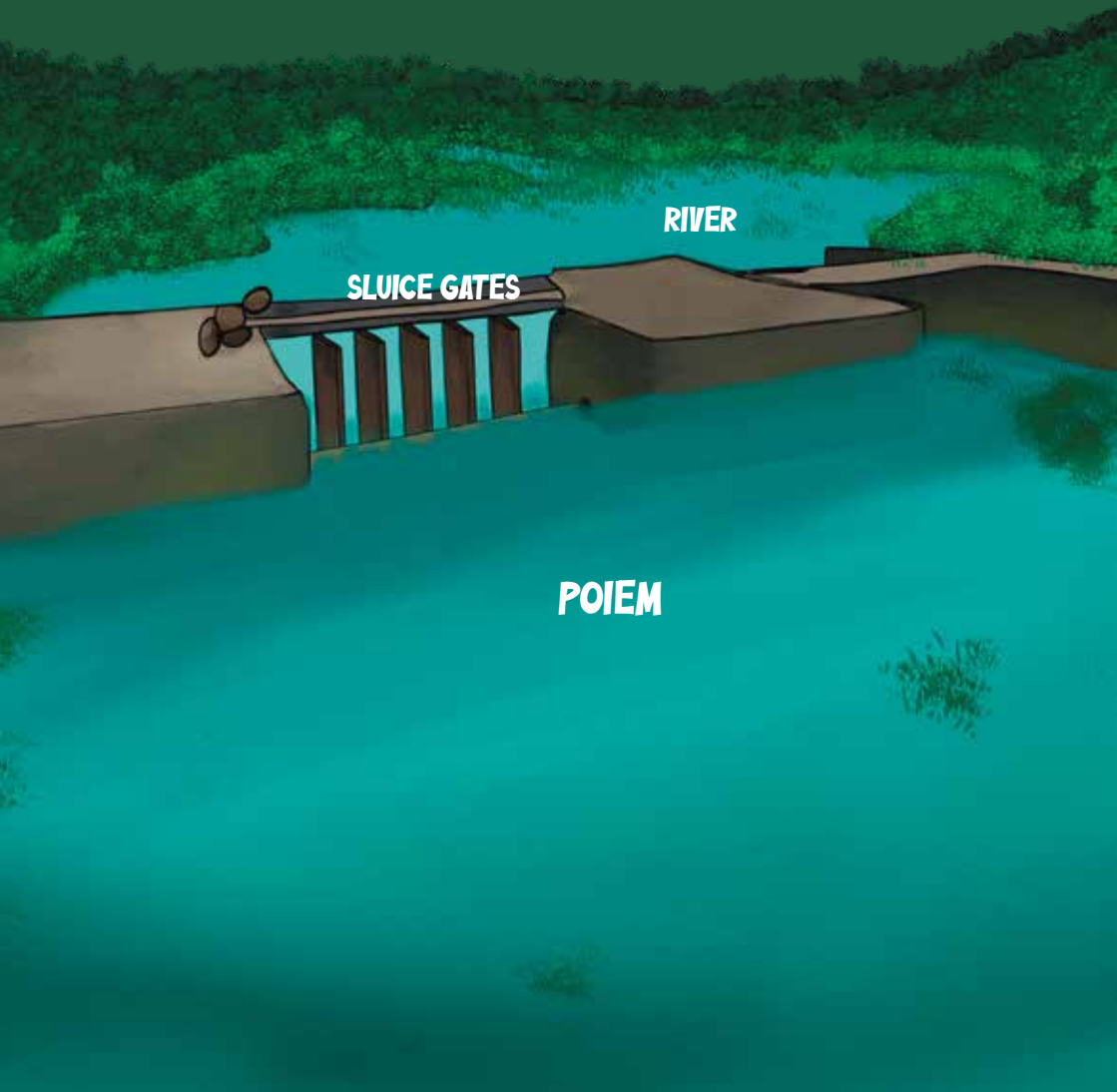
# WHAT IS A KHAZAN?

A recent study conducted by ICLEI South Asia (2021-2024) funded by Azim Premji University, identified khazans by the following features, “low-lying, saline, reclaimed flood plain, below river/sea level, protected by a bund, surrounded by mangroves, rich in biodiversity suitable for agriculture and aquaculture”.

**Khazans** are traditional farmlands in Goa that were created in low-lying areas near the coast. Goan ancestors built sea walls to keep out seawater, turning these spaces into usable land for growing crops.



They are characterized by intricate networks of sluice gates, embankments, and canals designed to control the flow of saltwater and freshwater, allowing for rice cultivation and aquaculture in areas prone to tidal flooding.



## Types of Khazans:

**1. Integrated Khazans:** These are like two-in-one farms where they grow rice and raise fish.



**2. Fish Farms (Khani/Agor):** These khazans are mainly used to raise fish.

**3. Salt-and-Fish Khazans (Mithagor):** In summer, they're used to make salt. But when the rainy season comes, they turn into big fish ponds.





● CURRENT LOCATIONS

● WHERE KHAZANS FIRST EMERGED

PERNEM

BARDEZ

DIVAR

Chorda

BICHOLIM

PONDA

TISWADI

DONGRI

MORMUGAO

CAVELOSSIM

SALCETE

CANACONA

# HISTORY OF KHAZANS

The first khazans were created by Neolithic settlers, likely ancestors of Gauda and Gaud Brahmins. They arrived in Goa and found that the fertile land was already occupied by indigenous groups like the Gaudas and Kharvis. These settlers allied with the Gaudas to reclaim tidal swamps, creating farmland for salt-tolerant rice.

**1000 BC - 1000 AD:** Khazans spread across Goa, starting in areas like Divar, Chora, Dongri, and Cavelossim.

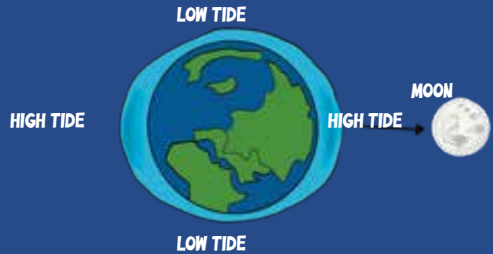
**957 AD - 1000 AD:** The Rashtrakuta-Kalyani Chalukyas period saw peak engineering of khazans. This era marked significant advancements in khazan construction and management.

**1000 AD:** By this time, khazans were well-established throughout Goa.

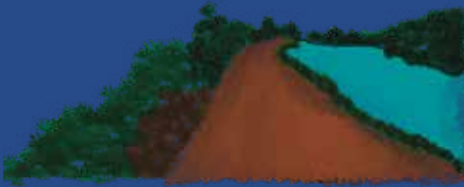
**2018 AD:** According to the Directorate of Agriculture, khazans covered about 17,500 hectares across eight of Goa's eleven talukas (subdistricts): Pernem, Tiswadi, Bicholim, Salcete, Bardez, Canacona, Ponda, and Mormugao.

# KHAZANS WERE MANAGED BY:

1. Keeping a note of the **tidal clock and salt levels of the water**. Availability of both the fresh and salty water was balanced to allow **farming and fishing**.



## BUNDS



2. **Building bunds** (walls to hold back water), shallow pits called **poiems**, and **sluice gates** (special doors to control water flow). Everything was made from strong, locally available materials.

3. Local groups called **'bous'**. These were set up by village communities known as **'gaunkaris'** to manage Khazans. Different people in this group had different tasks. Kamats maintained the walls, Kulkarnis managed the money, and Painis controlled the water flow and gates.

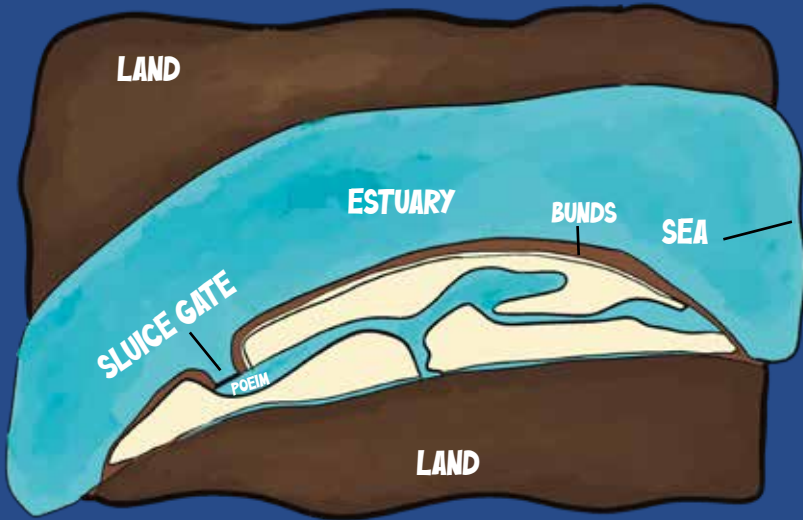
## SLUICE GATES



# HOW THE KHAZAN SYSTEM WORKS?

The **Khazan system** is a coastal farming method that carefully balances seawater and freshwater. Too much saltwater can harm crops and fish, while excess freshwater leads to weed growth and dirty water.

It uses large protective walls called **bunds or dykes** to keep most of the seawater out, with smaller inner walls called **mero**. These bunds are built using local materials and reinforced with clay-filled trenches called **chanoy** and a mud coating known as **tharcupto**.



Special gates called **manas**, made from rot-resistant matti wood, control the flow of water in and out of the system.

Waterways called **poiems** connect the inner areas to the sea, creating a nursery for young fish, crabs, and prawns. During high tide, water enters through the poiems, and during low tide, it drains back to the sea, enriched with nutrients from the farm fields.

Farmers grow rice, coconuts, and other crops in the Khazan fields, while the system also supports diverse habitats like mangroves and marshes.

# MANAGEMENT STRUCTURES

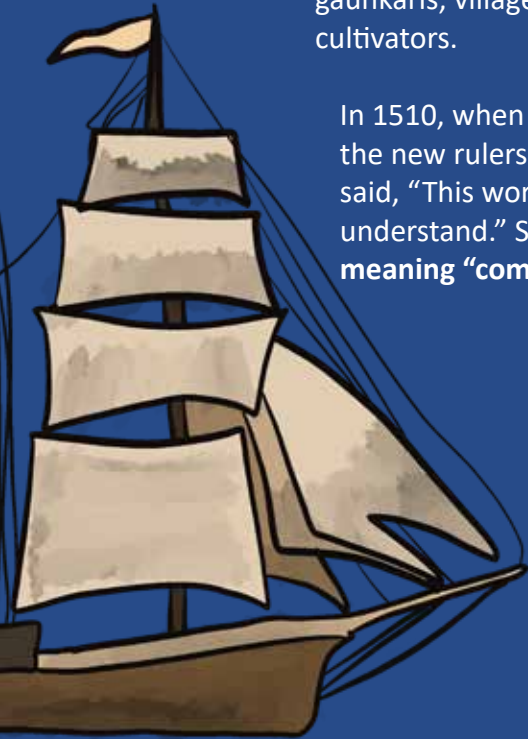
Khazans were communal lands controlled by gaunkaris, village councils composed of local cultivators.

In 1510, when Portuguese ships arrived in Goa, the new rulers looked at the gaunkari system and said, "This works well, but let's call it something we understand." So they renamed it "**comunidades,**" meaning "**communities**".

In 1882, groups called **bhous** to manage khazans became mandatory. Comunidades were officially recognised and were given more control over their land but they now had to answer to the government.

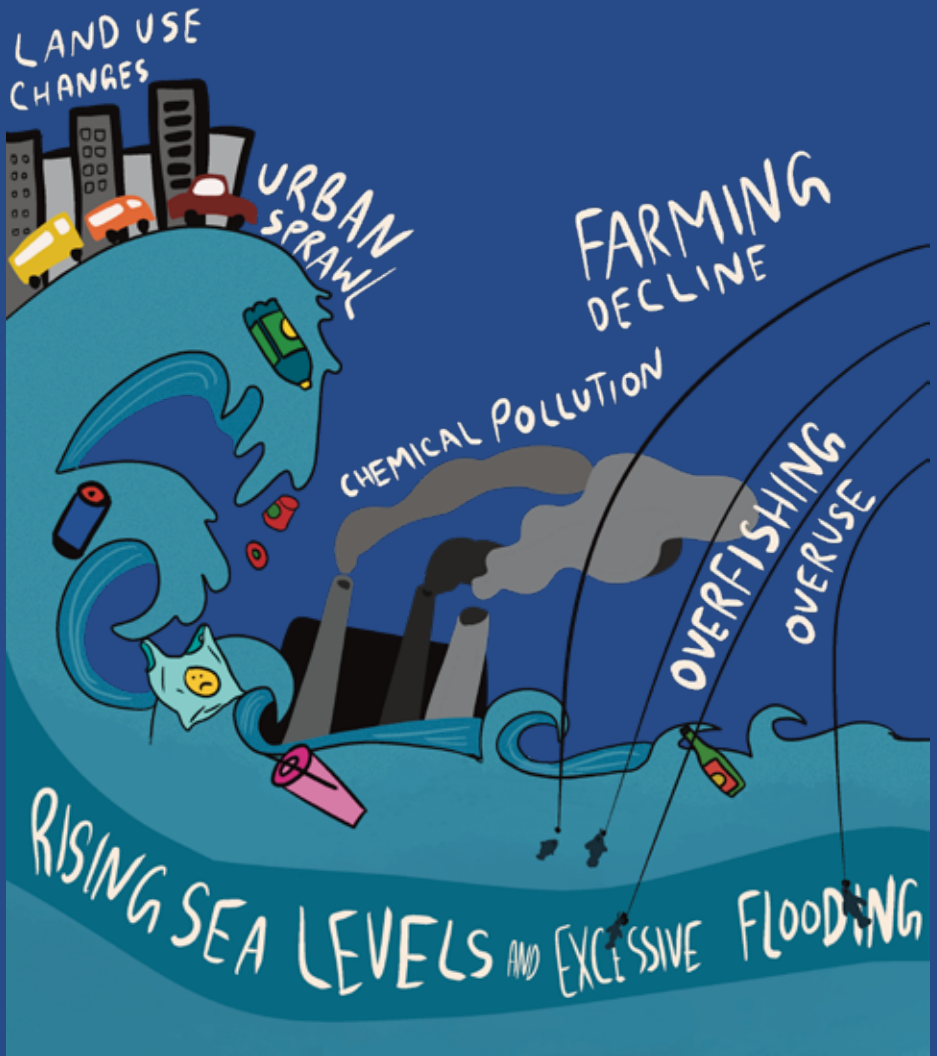
In 1964, after Goa's liberation, **the Goa, Daman, and Diu Agricultural Tenancy Act** brought big changes. It stripped communal ownership and transferred it to the tenants, the tillers of the land. This new setup created tenant associations, but they struggled. With less money coming in than the old system had, farmers lost interest in cultivating or managing khazans.

In the end, the government had to step in and maintain the khazans. Today, **Tenant Associations, The Revenue Department, The Water Resources Department, and The Directorate of Agriculture** work together to maintain khazans.





# WHY ARE KHAZANS AT RISK?



# WHY CONSERVE KHAZANS?

1. Khazans host **diverse ecosystems**, providing habitats for many species.
2. They contribute to Goa's economy through **agriculture, fishing, transport, and tourism**.
3. Khazans produce **rice, vegetables, coconuts, and fish**, helping maintain **local food supplies and traditional livelihoods**.
4. They act as **buffers against floods, prevent saltwater from contaminating freshwater sources, and improve coastal resilience**.
5. By **protecting infrastructure and promoting eco-friendly practices**, khazans support long-term coastal development.
6. These farms represent centuries of **agricultural tradition and community practices of Goa**.



# MANGE THAPNE

Some communities living near khazans celebrate a ritual called **“Mange Thapne”** at the end of the Hindu month of Paush.

**“Mange”** means crocodile, and **“Thapne”** means to make something from clay. Therefore, during the ritual, a clay crocodile is decorated with flowers and clam shells and worshipped.

The whole ceremony takes about 2-3 hours, and then everyone goes home.

**It’s a way of asking for safety while working near the water, which is important in their farming and fishing lifestyle.**



**Preserving these systems isn’t just about maintaining tradition – it’s about safeguarding Goa’s environment, economy, and future.**



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