

**BEFORE THE HON'BLE NATIONAL GREEN
TRIBUNAL, WESTERN ZONE BENCH AT PUNE**

O.A. 09/2023 [WZ]

BETWEEN:
THE GOA FOUNDATION

...APPLICANT

AND

THE MINISTRY OF ENVIRONMENT,
FOREST AND CLIMATE CHANGE AND ANR.

...RESPONDENTS

ADDITIONAL AFFIDAVIT OF THE APPLICANT

I, Dr. Claude Alvares, Secretary of the Goa Foundation, the Applicant herein, do hereby state on oath as under:

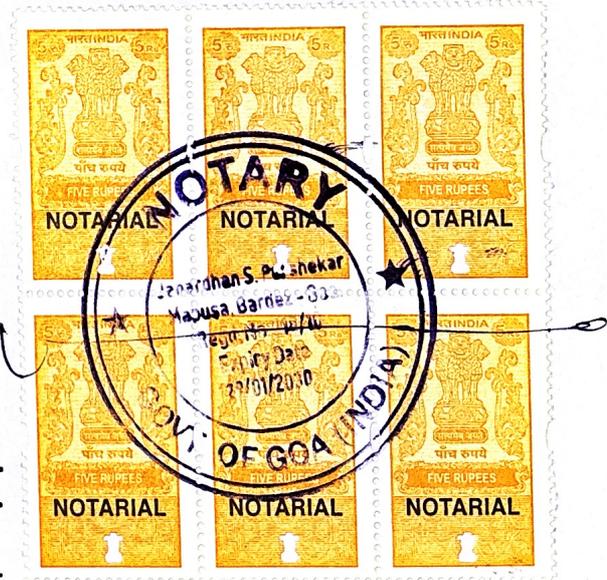
1. I state that in this O.A., the Applicant has challenged the provisions of the CRZ Notification, 2019, and one of the principal issues the Applicant is aggrieved by is the deletion of the special status for Goa's unique ecological assets namely Khazan Lands and Turtle Nesting Beaches.
2. In this regard, I state that I am filing this Additional affidavit to place on record a Note on the Khazan Lands and Turtle Nesting Sites in Goa, which is relevant for the consideration of the issues raised in this O.A.

3. I state that the contents of paragraphs 1 – 2 are partly in the nature of facts true to my own knowledge and as per official documents/records, and partly my submissions made on legal advice which I believe to be true and correct. No part of it is false and nothing material has been concealed therefrom.

Solemnly affirmed on the 8th day of July, 2025, at Mapusa, Goa



APPLICANT/DEPONENT



Solemnly affirmed before me by D. Claudio Alves
Who has been identified by

who has appeared to me personally
Mapusa, Goa

Reg. No. 3438/5 Date 08/07/25

[Signature]
JANARDHAN S. PARSHAKAR
NOTARY AT MAPUSA, BARDEZ - GOA.
STATE OF GOA (INDIA)

VERIFICATION

I, Dr. Claude Alvares, Secretary of the Goa Foundation, the Applicant herein, hereby verify that the contents of paras 1 - 3 of my above affidavit are true to my knowledge and belief, and that no part of it is false and nothing material has been concealed therefrom.



Verified on the 8th day of July, 2025, at Mapusa, Goa

APPLICANT/DEPENDENT



Solemnly affirmed before me by Dr. Claude Alvares
Who has been identified by

J.S. Parshekar
who is known to me personally
Mapusa - Goa.

Reg. No. 3438/25 Date 08/07/25

JANARDHAN S. PARSHEKAR
NOTARY AT MAPUSA, BARDEZ - GOA.
STATE OF GOA (INDIA)

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
WESTERN ZONE BENCH AT PUNE**

O.A. NO. 09 OF 2023 [WZ]

BETWEEN:

The Goa Foundation & Anr.

...APPLICANTS

AND

The Ministry of Environment, Forests
and Climate Change & Ors.

...RESPONDENTS

Note on behalf of the Applicants in O.A No 9/2023 [WZ]

Khazans of Goa

Khazan lands comprise the largest class of agricultural lands available for food and fish production in the state of Goa. These are approximately 18,000 ha in extent and are part of an intricate system of land-sea management unique to Goa.

Khazans were not mentioned in the CRZ 1991 notification. However, after a wide consultation with the people of the state through a series of public hearings in 2010, the MOEF amended the CRZ notification and thought fit to extend the protection of the CRZ notification 2011 to the khazan lands. These lands exist in relation to the tides and face tidal ingress. In fact, controlled tidal flows move through these lands, bringing

them within the definition of lands covered by the CRZ notification, since the extent of the notification in respect of land is the extent to which the tide reaches. The CRZ 2011 protection envisaged preparation of a Khazan Management Plan. This has since been produced by the Govt. of Goa, and a copy of the plan is attached to this note as **Annexure A-1**.

The entire section providing protection to these aspects of the CRZ in Goa – which are unique to Goa – is removed in the 2019 Notification, thus opening them to possible development, a prospect which is quite unthinkable and ill-advised in view of sea-level rise and climate change, represented by the Hazard Line. All khazans fall within the Hazard Line demarcated for the Goa coast. All are, by definition, affected by tidal ingress. All are located below sea level, as they were once recovered from the tidal rivers. Instead of recognizing the unique contribution of these lands to the state's granary, the CRZ 2019 has simply removed mention of the word "khazan" from the text of the notification itself, thus depriving them of the protection afforded to them under the provisions of the EPA, 1986.

This exclusion has indeed been noticed and noted by persons and agencies keen on using these lands for construction purposes. As an example, petitioners are annexing at **Annexure A-2** a recent two-page letter dt. 08.04.2025 written by the Village Panchayat of Santa-Cruz, Tiswadi, Goa to the GCZMA in connection to construct a market complex and Panchayat ghar in land identified in official records as khazan. On page 2 of the letter, the Panchayat informs the GCZMA that as per the CRZ notification 2019, the said land does not fall under any of the restricted categories or under the ecologically sensitive areas/coastal land use."

Turtle Nesting Sites in CRZ notification:

The CRZ notification 1991 mentions turtles only in one place. However, the CZMP 1996 prepared under the CRZ notification 1991 -- approved pursuant to directions issued by the Apex court in the 1996 CRZ judgment -- named Morjim and Mandrem as turtle nesting sites.

In the 2011 notification, two more sites were added: Galgibag and Agonda. The notification read:

8. (vii) The beaches such as Mandrem, Morjim, Galgibag and Agonda have been designated as turtle nesting sites and protected under the Wildlife Protection Act, 1972 and these areas shall be surveyed and management plan prepared for protection of these turtle nesting sites;

(viii) No developmental activities shall be permitted in the turtle breeding areas referred to in sub-paragraph (vii).

For no specific reason, the names of all 4 turtle nesting beaches (though notified under the Wildlife Act, 1972) are deleted in the CRZ 2019, thus removing the protection regime required for turtle nesting sites and management of these sites. This was replaced by a general recommendation for preparation of a turtle conservation programme. This would be disastrous, if implemented.

All sandy beaches in Goa are under pressure from tourist activity. The special protection accorded to the 4 sites ensured that activities permitted on other beaches (including water sports, etc) were not permitted on the 4 beaches. These beaches also had turtle egg nurseries.

The protection given to the turtle nesting program has resulted in huge increase in turtle nestings. The table below is the most up to date data available, and is obtained from the Forest Department.

Aggregate annual turtle nesting data for Morjim, Agonda and Galgibag from 1999 to 2024 is presented hereunder:

Year	Total nests	Total eggs laid	Total hatchlings released
1999-2000	24	2262	1470
2000-2001	73	7989	5716
2001-2002	58	5864	4081
2002-2003	40	3607	3078
2003-2004	29	2828	1797
2004-2005	17	1568	1066
2005-2006	14	1599	1175
2006-2007	25	2641	1940
2007-2008	20	2443	1940
2008-2009	14	1488	1080

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2009-2010	20	2119	1316
2010-2011	16	1820	974
2011-2012*	29	2801	1926
2012-2013*	23	2532	1706
2013-2014*	9	965	549
2014-2015	14	1852	926
2015-2016	25	2572	1836
2016-2017	47	4979	2853
2017-2018*	39	4282	2627
2018-2019*	40	4743	3011
2019-2020*	27	3113	1927
2020-2021*	63	6933	4930
2021-2022*	91	9958	8467
2022-2023*	162	17647	12598
2023-2024*	447	45493	28707
TOTAL	1366	144098	97696

KHAZAN LAND MANAGEMENT PLAN

Prepared by the



**DEPARTMENT OF
ENVIRONMENT & CLIMATE CHANGE**

**GOVERNMENT OF GOA
2025**

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PREFACE

The Khazan lands of Goa represent one of the most intricate and historically significant examples of community-managed ecosystems in India. These unique coastal wetlands, shaped and maintained through traditional indigenous knowledge systems for centuries, exemplify the harmony between human livelihood and ecological balance. Hence there is need to map this unique ecosystem.

This **Khazan Land Management Plan** has been developed with the objective of restoring, conserving, and sustainably managing the Khazan ecosystem while ensuring the participation and well-being of the local communities who depend on it. The plan is the result of extensive consultations with local stakeholders, experts, and government bodies, and is informed by both scientific assessments and traditional ecological wisdom. It also emphasizes the need for institutional frameworks and policy support to revitalize the Khazan lands and integrate them into broader climate resilience and coastal sustainability goals.

The Khazan land management plan has made an effort to combine the traditional knowledge with modern techniques; in order to revive the Khazan system for future generations. This document is a guide for taking action for conservation of khazan land.

ACKNOWLEDGEMENT

The Department of Environment & Climate Change would like to express sincere gratitude to the committee members for their valuable input in drafting **Khazan Land Management Plan**.

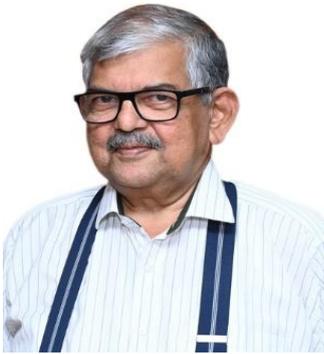
A special thanks to Ar. Elsa Fernandes, President of the Khazan Society of Goa, for her invaluable guidance and expertise in finalising the Khazan Management Plan. Her insights and leadership have been instrumental in shaping a thoughtful and sustainable approach to the preservation and management of Goa's khazan ecosystems.

We are also grateful to the Chief Engineer and all the engineering team of Water Resource Department who visited the sites during monsoon to carry out khazan land mapping.

Sincere gratitude to the Director, Mr. Sachin Desai and Officer on Special Duty, Mr. Sanjeev Joglekar for their masterful co-ordination, guidance, support and encouragement during the process of preparation of Khazan Management Plan.

We also thank Mr. Claude Alvares-President Goa Foundation, Mr. Premanand Mhambrey- Chairman Tiswadi FPC, Mr. Ankush Gaunker-Additional Executive Engineer WRD, Mr. Trivesh Mayekar –Sr. Scientist, ICAR-CCARI for their valuable inputs in making of this plan.

The dedicated efforts of the Scientific Assistants and Environmental Assistants of the Department of Environment & Climate Change are gratefully acknowledged for their vital role in supporting this initiative.



Shri. Aleixo Sequeira

Minister for Environment, Government of Goa

MESSAGE

*It gives me great pleasure to share this message for the **Khazan Land Management Plan**, a timely and significant initiative aimed at preserving one of Goa's most unique and historically significant ecosystems.*

Khazan lands represent centuries-old community-managed coastal wetlands that have supported agriculture, aquaculture, and salt production while maintaining ecological balance. These traditional systems are a testament to the deep-rooted wisdom of local communities in sustainably managing natural resources.

This management plan is a valuable step in that direction. It combines traditional knowledge with modern ecological understanding and sets a framework for community participation, biodiversity conservation, and sustainable development. I commend the efforts of all stakeholders, government agencies, local communities who have contributed to this initiative.

The Ministry of Environment remains committed to supporting such efforts that align with our vision of ecological resilience, climate action, and inclusive growth. I sincerely hope this plan will guide effective action on the ground and serve as a model for the conservation of other fragile ecosystems.

Let us all work together to safeguard Goa's rich environmental heritage for the present and for generations to come.

Shri. Aleixo Sequeira
Minister for Environment



Shri. Arun Kumar Mishra, IAS
Secretary of Environment, Goa & Chairman, Goa
Coastal Zone Management Authority

MESSAGE

*It is with great satisfaction that I extend my support to the **Khazan Land Management Plan**, an important step toward the sustainable revival of Goa's traditional wetland ecosystems.*

This plan outlines practical strategies for conservation, restoration, and sustainable use of Khazan lands. Most importantly, it recognizes the central role of local communities and traditional knowledge in ensuring the long-term health of these ecosystems.

I would like to thank everyone involved in the preparation of this plan—the Department of Environment & Climate Change, local panchayats, environmental experts, and the dedicated Scientific and Environmental Assistants who worked on the ground. Your efforts show how we can work together for a better future.

The Department is fully committed to supporting the implementation of this plan. We believe that with continued cooperation and care, Khazan lands can once again thrive and serve as a model for sustainable development.

Let us all join hands to protect this important part of Goa's identity—for our environment, our communities, and the generations to come.

Shri. Arun Kumar Mishra, IAS
Secretary of Environment, Goa & Chairman, Goa Coastal
Zone Management Authority

Executive Summary

Khazan Lands are low-lying estuarine lands in Goa, reclaimed thousands of years ago and once known as the region's rice bowl. It is mostly located in the low lying flood plains of Mandovi and Zuari estuaries (approx. 18,500 Ha). As per CZMP 2011, NCSCM report total area of Khazan land in Goa is 13,166 Ha.

Goa, since time immemorial has been an agrarian territory where agriculture and fishery were the main means of livelihood and sustenance. These lands form a man-made agricultural ecosystem created by local farming communities (called *Gaunkars*) for growing rice, fish, coconuts, vegetables, and salt.

This system was managed cooperatively through a traditional, unwritten framework known as the *Gaunkari* system. Later, during Portuguese rule, the system was studied and formalized under the *Código de Comunidades*, which laid down rules for joint ownership and cultivation by local communities (*Comunidades*).

After Goa's liberation in 1961 and the introduction of the Agricultural Tenancy Act (1964), tenants of these lands became deemed owners of the plots they cultivated. The Act also set up Tenants' Associations to manage Khazan Lands under the supervision of government officers (*Mamlatdars*). However, due to changing laws and shifting responsibilities, the cooperative spirit of the old systems weakened.

A typical Khazan Land ecosystem includes:

- **Bunds:** earthen embankments protecting fields from tidal water
- **Sluice Gates (manos):** control water flow
- **Poiems:** water bodies used for storage and fish farming
- **Rice fields**

During the preparation of CZMP 2011, the field survey conducted by the Water Resource Department along with the Biodiversity management committee for identification of Khazan lands, the length of all types of occupied bunds is roughly estimated about 644km. These bunds are notified by Revenue dept. under provision of agriculture tenancy act 1964 and Rule 1965.

Background

As per the CRZ Notification 2011 the eco sensitive low lying areas which are influenced by tidal action known as khazan lands shall be mapped; the mangroves along such as khazan land shall be protected and a management plan for the khazan land prepared and no developmental activities shall be permitted in the khazan land. Because of this mandate the Government of Goa vide Order No: 2-81-2020/Dir/Env & CC/577 dated 08.09.2020 (*Annexure I*) constituted a Committee. The Committee studied various available past Official "Reports / Documents" and Research Papers on the subject matter. Further, the Committee also embarked on site visits and held several meetings to deliberate on issues pertinent to the current status of Khazan Lands in Goa, to come out with a broad Draft Plan for management of the same.

The committee comprised of the following members:

1. Dr Simon D'Souza	...	Chairman
2. Dr Naraina P. S. Varde	...	Member
3. Shri Subrai Nadkarni	...	Member
4. Dr Vinod Dhargalkar	...	Member
5. Dr Fraddy D'Souza	...	Member
6. Shri Raya Shankwalker	...	Member
7. Shri Shrikant Priolkar	...	Member
8. Shri Suraj Pagui	...	Member
9. Shri Bhau Kalangutkar	...	Member
10. Shri Tolentino Furtado	...	Member
11. Shri Neville Alfonso	...	Member Convenor

The Committee held meetings on 17.09.2020, 23.09.2020, 01.10.2020, 09.10.2020, 16.10.2020, 20.10.2020, 23.10.2010, 30.10.2020, 06.11.2020, 17.11.2020, 27.11.2020, 07.12.2020, 14.07.2020 and 21.12.2020 to deliberate at length on various "facts/problems" relevant to Khazan Land Ecosystems gathered from previous official Reports, Documents and Research Literature. Further, additional inputs were sought from concerned Government

Departments and some typical Khazan Land sites were visited on 30.11.2020 to see the status at loco.

The committee made draft plan and it was put in public domain for public consultation in 2021-2022 for CZMP 2011. The comments for the same has not received by the committee.

Since the 1980s, due to legal, economic, and social changes, maintaining these lands and growing rice has become unviable. Many Khazan Lands are now abandoned or flooded with saline water. The main activity that continues—often illegally—is fishing near the sluice gates. Some privately held lands are now used solely for unauthorized fish farming.

After examining the issue in details, The Committee suggests a comprehensive plan to restore and cultivate Khazan Lands effectively. The Department of Environment and Climate Change took meetings on 22/08/2024 and 21/03/2025 including all the stakeholders and expert members so as to finalise the preparation of Khazan Management Plan. It is suggested to divide Khazan Management Plan in four parts:

1. **Data Mapping:** Pilot mapping cases can be taken up to decide a framework for mapping the Khazan extent
2. **Management regime:** Networking the stakeholders with the central management authority for Khazans needs to be established and activated before any action plan is laid for execution
3. **Action Plan:** Central Khazan authority should finalise and prioritise the action plan, which should include pilot designs, outcome mapping, stakeholders engagement mapping, productive land restoration data, etc
4. **Review:** Management Plan periodic review protocol should be pre-decided and built into the Khazan Management Plan layout involving layers of all stakeholders, and the corrective measures should be incorporated accordingly.

Khazan Land Ecosystem over the Years

The Khazan Land Ecosystems in Goa are man-made lands reclaimed from the Estuaries by an intricately constructed system of Bunds meticulously engineered by the nomadic community of Gaudas who migrated from forests to the central region of Goa. Gaudas were also the first settlers to initiate and practice the shifting "kumeri" cultivation for agricultural sustenance in Goa.

The Gaudas led a communitarian way of life known as the Gaunkary system. The new settlers were Brahmins who settled in Goa before the Christian era. For a long time, there was a good co-existence between Gaudas, Mith-gaudas and Gaud Brahmins. Their cumulative knowledge resulted in the evolution of a new Agrarian System based on collective maintenance of bunds, sluices, channels, etc and joint cultivation of Khazan fields. The profits were shared amongst the members. Historians say that this Gaunkary system was evolved in Goa about 3000 years back.

The Khazan lands show a superb and harmonious blend of men, marine "flora/fauna", land, crops and water. The development of Khazan Land Ecosystem involved the use of traditional knowledge of climate, tidal cycles, geomorphology, monsoon vagaries, sedimentation dynamics, soil properties, etc, gained by the earlier settlers through years of "trial and error" methods spanning generations.

Various historians also state that the rulers of Goa granted land on saline plains to the people, who converted them into cultivable lands with their collective Gaunkary way of life. There are also some references in literature to the effect that the Khazans enjoyed a tax free regime granted by some rulers subject to the

condition that Bunds were provided and maintained to prevent the intrusion of saline water and help land "reclamation/maintenance" for Rice cultivation.

With the advent of the colonial rule, the Gaunkary system was examined and documented by the Portuguese, after studying the working of the same and giving it a legal framework. The Government introduced the 'Codigo de Comunidades' or Code of Comunidades. The Code provided for the formation of a voluntary body of farmers known as "Bous" which was assigned the responsibility of management of Bunds and Sluice Gates. A "vigia" was also employed to keep a close watch on the condition of bunds on a day to day basis. Even a minor breach or a tiny infiltration of water through the bund was promptly reported to the "Bous" and immediate steps were taken to implement necessary repairs. The cost of repairs was recovered from the farmers whose fields were protected by the repaired bund. Comunidades raised funds by auctioning the rights of cultivation to farmers and fishing rights in the water bodies to the fishing community. The Comunidades had to pay 'Jon' (royalty) and 'For' (rent) to the Church 'or/and' to the Government. Some of the policies of Comunidades were good and favourable for agriculture:

- i) Allowing land use only after permission
- ii) Levy Fine on persons who bid and yet did not cultivate the land
- iii) Prohibition of transferring or sub-letting without permission
- iv) Declare the field as waste land if rent is unpaid for ten years
- v) No permission was granted to take part in auction if one has not cultivated his land a year back.

Present Scenario

Goa was freed from Portuguese rule in 1961 and became part of India. In 1964, a new law gave ownership of farmland to the tenants who worked on it, replacing the land ownership in the old Gaunkary or Comunidade system. These tenants also were responsible for maintaining bunds (mud embankments) and sluice gates that protect the coastal Khazan lands, collectively.

The Agricultural Tenancy Act (1964) also provided for a stronger role of Government in the administration of Tenants' Associations through the respective Mamlatdars. The Sluice Gates are auctioned in the presence of Mamlatdar. The above changes made the Tenants' Associations rely on Government subsidies. Further, fishing became the prime activity and agriculture and salt extraction took a back stage due to strong market forces encouraging fishery.

The works of repairs of bunds and sluice gates were entrusted to the Soil Conservation Division of Directorate of Agriculture. The State Government notified the Pattern of Assistance for repair of bunds as under:

Category I: The "Tenant's Association/Beneficiaries" willing to carry out the repairs of their khazan bunds are provided with a reimbursement of 50% of the expenditure incurred as per the procedure laid out.

Category II: The Khazan bunds requiring major repairs beyond the capability of the Tenant Association/Beneficiaries, as decided by Mamlatdar, are repaired by the Government and 50% of the cost incurred is recovered from "Tenants' Associations/ Beneficiaries" @ 6% rate of interest in ten instalments.

Category III: This pattern was implemented from 2003-04 onwards.

Under this scheme, bunds are improved through more structurally sound earth, widened and their height increased wherever such improvements are found

essential and notified as such by the Mamlatdar. The works are carried out by the Government and only 10% of the expenditure incurred is recovered from the beneficiaries in ten instalments.

The Rules make it compulsory to constitute a Tenants' Association of beneficiaries deriving benefits from the notified bunds. Their responsibility is collective and it is mandatory on part of the Tenants' Associations to perform the following:

- a) Maintain a regularly updated list of tenants, and a functioning working committee.
- b) Take all steps necessary for conservation, "maintenance / repairs" of the bunds.
- c) Get estimates prepared for repairs and maintenance from the Soil Conservation Division.
- d) Auction the rights of fishing in the vicinity of the sluice gates and lease out bearing coconut trees on the bunds for plucking.
- e) Take immediate steps for closure of breach in the bunds and get work executed.

There are a number of provisions in the Agricultural Tenancy Act and the Rules made thereof. However, from the information available, many Tenants' Associations are not functioning as per the Act and Rules and a number of them are defunct. There are clandestine incidents whereby conditions are manipulated for unauthorized increase in production of fish solely for profit motive. In some cases, it has been found that some bunds are purposely breached to increase fish catch at the peril of the loss of agricultural soils by flooding and increase in salinity. Due to this the inland fresh water sources are also threatened by salinity ingress.

To summarize, due to unfavourable economic conditions for remunerative Rice cultivation, shortage of agricultural labour, problems of ownership, high cost of bund maintenance, lack of cooperative spirit and high demand for fish, priorities have changed. The focus has shifted to auctioning of the sluice gates for fishing rights and the desire for cultivating Rice and producing Salt have taken a back seat. Consequently, the number of Khazan Land Tenants who genuinely feel the need to maintain the bunds to "protect/cultivate" their Rice fields has dwindled and here too, due to the advent of "subsidy culture" the Government finds it difficult to recover the Tenants' share of the amount spent on bund & sluice gate repairs.

Over the years, 'rapid/rampant' urbanization and allied development works have caused serious encroachment cum pollution stress on khazan lands, especially those near major "urban/tourism" centers.

Developments in and around Panaji, Margao, Calangute, Mapusa and Candolim are typical examples of such cases. The pollution of estuarine water caused by anthropogenic effluents, strewn domestic garbage, construction debris and run-off from mining areas, have adversely affected the Khazan Ecosystems. Further, the increased wave heights due to ore carrying barges have also affected the bunds and the adjoining khazans. The destruction caused by uncontrolled illegal pisciculture has added to its woes. Some Khazan lands near sub-urban settlements have been consumed due to encroachments by illegal scrap yards and erection of slums on bunds.

The change in scenario from community ownership to deemed ownership of tenants has resulted in "bad/poor" maintenance of bunds. The bunds were made of locally available estuarine clay and its structural weakness was reinforced by mixing straw (copto). The bunds are prone to attacks by burrowing marine creatures like crabs. Hence, their regular day to day maintenance is extremely important for their long term sustainance at a very low cost. This is almost

impossible in the present socio-economic set up as explained above. Thus small unattended leakages over an extended period result in big breaches which require huge capital costs for repairs "and/or" reconstruction. Thus many bunds are left in a dilapidated condition and the Tenants expect Government to take up the repairs of such bunds at huge capital cost. The fields in many cases are left fallow due to various factors and emphasis is given on pisciculture as discussed earlier. However, even today in some Khazan lands Tenants who are devoted to agriculture and have no other means of income have been cultivating their fields rather satisfactorily. In some areas even irrigation is resorted to by lathis and traditional irrigation methods for growing local vegetables in Rabi season after harvesting Kharif Rice.

The salt pans in the khazans were earlier a revenue earning activity and the salt was even exported. However, after the advent of iodized salt and other socio-economic issues the salt pans are now mostly in disuse. The salt pans are presently still active are in some parts of Tiswadi, Salcete and Pernem talukas.

Recommendations

- The NCZMA had 39th meeting of the National coastal Zone Management Authority held on 13.01.2020, considered the representation of State Government to restrict the HTL along the bunds and has recommended as follow:

The NCZMA deliberated the issue and observed that in so far as Khazan Land issue is concern, there is valid reason and accordingly it can be agreed that HTL shall be restricted to the bund/slucice gate but keeping the mangrove areas as RZ-IA. NCZMA however agreed that the mangroves shall be untouched and protected. It was further decided that since this would require an amendment of CRZ regulations, the same may be done as appropriately as follows:

“In case, there exist a bund or a sluice gate constructed in the past, prior to the date of notification issued vide S.O. 114 (E), dated 19.02.1991, the HTL shall be restricted to the line along the bund or the sluice gate. In such a case, area under mangroves arising due to saline water ingress beyond the bund or sluice gate shall be classified as RZ-IA, irrespective of the extent of the area beyond the bund or sluice gate”.

The NCZMA also decided that the state government shall immediately take up work for restoration of the bunds/slucice gates and its proper operation and maintenance.

- 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.
- Climate-smart agricultural and aquaculture practices, including salt-tolerant crop varieties (developed by ICAR-CCARI or any other institutes) and flood-resistant crop varieties can be promoted.
- Multi-cropping systems by integrating salt-tolerant rice with legumes, vegetables, and fodder crops to improve soil fertility and maximize land use can be promoted.

- Horticulture-based farming by cultivating salt-tolerant fruit crops such as cashew, coconut, banana, and guava along the bunds of Khazan lands can be promoted.
- Utilize IFS/ intercropping models, such as paddy with pulses (*black gram, green gram*), or paddy with vegetables (*brinjal, okra, leafy greens*), to optimize nutrient cycling and economic returns.
- Encourage high-yielding, salt-tolerant paddy varieties like *Korgut, Jyoti*, and *Goa Dhan 1-4* to enhance rice production in Khazan lands.
- Promote climate-resilient varieties of vegetables and fodder crops that can withstand periodic salinity fluctuations.
- Introduce biofortified and stress-tolerant crop varieties developed by ICAR institutes to improve nutritional security and farm resilience.
- Promote cultivation of salt-tolerant fodder crops such as napier grass, para grass, and fodder sorghum in low-salinity zones of Khazan lands.
- Integrate leguminous fodder crops (cowpea, horse gram, sesbania) with paddy cultivation to enhance soil nitrogen content and provide nutritious fodder.
- Utilize bunds and fallow lands for growing multi-cut fodder species like super napier and hybrid bajra-napier to optimize land use.
- Implement controlled tidal irrigation to regulate salinity levels and improve fodder crop growth in brackishwater environments.
- Encourage organic soil amendments like compost and biofertilizers to enhance soil fertility and support sustainable fodder production.
- Develop community-based fodder banks to ensure year-round availability of fodder for livestock in Khazan farming systems.
- Promote silvo-pastoral systems by integrating fodder trees (*subabul, gliricidia, moringa*) along Khazan bunds for sustainable livestock feeding.

- Provide training and capacity-building programs for farmers on improved fodder cultivation techniques and efficient utilization.

A COMPREHENSIVE PLAN TO RESTORE AND CULTIVATE KHAZAN LANDS EFFECTIVELY MAPPING:

- I. **Khazan Land Study/Mapping:** A detailed study cum mapping is needed to understand **total Khazan land and ownership, Status of sluice gates, salt pans, and bunds, Functional Tenants' Associations and their activities over the past 5 years, Auction details and earnings from fisheries, Total number of internal water bodies, poiem.** This data which can be additionally verified as per ground truthing including its status if degraded. Degraded lands which cannot be restored should be identified.

Action Plan:

To undertake GIS-based mapping, a pilot study for identification of Khazan lands using UAV-based LiDAR technology by involving local communities. Classification can be based on salinity levels, acidity levels, water retention capacity, and existing land use patterns, highly productive zones, degraded areas, and restoration sites.

- II. **ZONING:** Understanding the extent and distribution of salinity is crucial for the revival action plans for both sustainable agriculture and aquaculture.

Khazan Lands into Zones

Classify the land into 4 zones based on salinity:

- **K-1:** Low salinity – good for vegetables and second-season rice
- **K-2:** Moderate salinity – can grow salt-tolerant rice

- **K-3:** High salinity – suitable for traditional rice, salt, and fish farming
- **HK:** Highly degraded – mostly abandoned with mangrove growth.

Action Plan:

a. Low Salinity Zone (Salinity < 5 ppt) – Suitable for Agriculture and Freshwater Aquaculture

Recommended Land Use:

- **Agriculture:** Cultivation of salt-tolerant rice varieties (e.g., Korgut, Jyoti, Goa Dhan 1-4).
- **Horticulture:** Growing fruit crops (banana, coconut, arecanut) and fodder along bunds.
- **Integrated Farming Systems (IFS):** Combination of paddy, freshwater fish culture (e.g., Indian Major Carps), and livestock (duck, poultry, or dairy).
- **Freshwater Aquaculture:** Farming of species such as catla, rohu, tilapia, and freshwater prawns.

b. Moderate Salinity Zone (Salinity 5-15 ppt) – Brackishwater Aquaculture & Mixed Farming

Recommended Land Use:

- **Integrated Rice-Fish Farming:** Seasonal rice cultivation followed by post-monsoon shrimp/crab farming.
- **Sluice Gate-Controlled Fisheries:** Regulation of water salinity for optimal fish and shrimp farming.
- **Agro forestry:** Planting of salt-tolerant crops and trees such as casuarina, pongamia, and acacia along bunds for soil stabilization.
- **Brackishwater Aquaculture:** Culture of salt-tolerant fish species like mullets (*Mugil cephalus*), milkfish (*Chanos chanos*), and seabass (*Lates calcarifer*).

- Silvo-Fisheries (Mangrove-Based Aquaculture): Polyculture of crabs (*Scylla serrata*), shrimps (*Penaeus monodon*), and filter feeders (oysters, mussels) within mangrove patches.

c. High Salinity Zone (Salinity > 15 ppt) – Mangrove Conservation & Coastal Aquaculture

Recommended Land Use:

- Mangrove Conservation: Establishing buffer zones with native mangrove species (*Avicennia marina*, *Rhizophora mucronata*, *Sonneratia alba*) for erosion control, carbon sequestration, and fish breeding.
- Open-Tidal Aquaculture: Farming of species adapted to high salinity, such as grey mullets, seabass, crabs, and oysters.
- Seaweed Farming: Cultivation of *Gracilaria*, *Kappaphycus*, and other salt-tolerant seaweed species for biomass production and water quality enhancement.

III. LEGAL FRAMEWORK:

New Laws/Rules needs to be framed to kick start the Khazan revival and Management.

- **Cooperative or contract farming** by landowners needs to be explored
- Special agency to plan and manage Khazan land needs to be constituted

The Khazan Board

The key step in the Khazan Management Plan (KMP) is to officially set up the **Khazan Board** (or any similar agency the government chooses. This Board will manage all areas as zoned in four categories K1, K2, K3 and HK. Its decisions on land use will be final and will override the Regional Plan, ODPs, and other

land use policies — except the **Goa Land Use Act of 1991**, which will continue to apply to lands under Agricultural Tenancy as these lands are also outside the scope of the **TCP Act, 1974**.

The **Department of Environment and Climate Change (DOE&CC)** will officially notify the formation of the Khazan Board and act as its secretariat. Once formed, the Board will prepare the detailed KMP based on the **CRZ 2011 notification** and the approved **Coastal Zone Management Plan (CZMP)**. DOE & CC will define the Board's legal powers, structure, and responsibilities within six months. KMP will be reviewed and updated as per the CZMP and CRZ notification in force from time to time.

IV. Soil and Water Profiling in Khazan Lands for Improved Productivity:

- To Conduct comprehensive soil mapping and salinity profiling across different Khazan zones to assess soil health and productivity potential for determination of suitable crop and aquaculture zones.

Action Plan

- To implement periodic water quality monitoring to measure parameters like salinity, pH, dissolved oxygen, nutrients, and heavy metal contamination to ensure safe aquaculture and agriculture practices.
- To promote desalinization techniques, controlled tidal flushing, and freshwater irrigation to maintain soil fertility and improve agricultural productivity.
- To utilize bio-remediation techniques such as microbial consortia and organic amendments to enhance soil and water quality in consultation with ICAR and other institutes.

- Implement controlled tidal irrigation and drainage to manage water salinity and prevent soil degradation.
- Promote organic amendments such as farmyard manure, compost, and microbial biofertilizers to improve soil fertility and water retention.
- Utilize bio-drainage techniques by planting deep-rooted trees to control waterlogging and salinity intrusion.
- Encourage traditional soil fertility management techniques, such as green manuring, which improve soil structure and nutrient content.
- Multi-cropping systems by integrating salt-tolerant rice with legumes, vegetables, and fodder crops to improve soil fertility and maximize land use can be promoted.
- Utilize IFS/ intercropping models, such as paddy with pulses (*black gram, green gram*), or paddy with vegetables (*brinjal, okra, leafy greens*), to optimize nutrient cycling and economic returns.

V. Agriculture Revival

- Create a state plan to preserve all farmland and improve food security by growing more rice, vegetables, and fish locally. Survey the land for cultivation/ type of cultivation (Area under Kharif rice, Rabi rice, vegetables, coconut, and Poins) on existing active khazan lands and land left fallow.

VI. CRZ Zone for the Poiems: The "Poiems" are the internal water bodies upstream of the Sluice Gates on the outer Bunds also marked as the HTL. All "Poiems" should be allotted zone under CRZ regulations. Necessary measures to be taken in this regard with all other authorities.

Main Functions of Poiems:

1. **Salinity Buffer:** They help balance salt and fresh water levels.
2. **Water Storage:** Act as holding basins for excess water.
3. **Paddy Field Support:** Help maintain ideal water levels in rice fields.
4. **Fish Rearing:** Serve as fish farms, especially for seasonal fishing.
5. **Irrigation Source:** Provide water for nearby crops during dry spells in the monsoon.

6. **Fractional ground recharge:** Fresh water recharge into the ground.
7. **Tool to obstruct salinity ingress:** surface and under water recharge with fresh water keeps salinity ingress at bay.

VII. Flood Hazard line: Khazan Management Plan should incorporate the mapped Flood Hazard Line for understanding the vulnerability of Khazan Lands considering from in this regard affecting all the four zones categories should be aligned in the KMP.

VIII. Sluice Gate Management for Khazan Lands: Sluice gates (locally called *manos*) regulate the entry and exit of water between rivers/estuaries and the upstream Khazan lands. Sluice gates are also used to trap fish and prawns that enter with the tide, supporting seasonal, sustainable fishing practices. By blocking excess saline water during high tide, sluice gates prevent damage to crops like rice and vegetables. They allow farmers to switch between agriculture and aquaculture depending on the season, making integrated farming possible.

Action Plan

- **Status mapping:** Village wise Manos to be mapped with status
- **Repair and Maintenance:** Protocols and priorities to be established for design, desiltation, etc
- **Monitoring:** regular inspection and monitoring mechanism to be set up.
- **Stakeholders Involvement:** Train community members to manage sluice gates and involve them in planning and operations.
- **Eco-Friendly Design:** Use fish-friendly gates that let aquatic life pass through without harming migration patterns. Explore new ecofriendly materials.
- **Modern Technological Tools:** computer models to study water movement, sediment buildup, climate change impacts and automated sensor based water flow etc can be explored.

IX. Bunds:

Bunds (earthen embankments) act as barriers that protect Khazan lands from tidal and saline water intrusion during high tide or storms. They help maintain the right water levels inside the fields supported by sluice gates to allow controlled water entry and exit. By keeping out saltwater, bunds help preserve the fertility of the soil, making it suitable for rice farming and vegetable cultivation. Strong bunds reduce erosion of agricultural land by stabilizing the boundary between the saline estuarine water and the cultivated fields. Bunds help create a safe and controlled environment for both fish farming (in Poiems) and paddy cultivation by maintaining separation from brackish water.

Bunds Maintenance:

- Traditionally managed by local communities under *Comunidades* or *Gaunkari* systems, with labor and material contributions from members.
- In modern times, government schemes support bund repairs, but involvement of local tenants is encouraged for sustainability.

Action Plan

- **Bund Strengthening:** Suggests planting mangrove species on the waterfront side of bunds to protect them from tidal forces and improve their stability. Horticulture-based farming by cultivating salt-tolerant fruit crops such as cashew, coconut, banana, and guava along the bunds of Khazan lands can be promoted.
- **Indigenous Bund Repair Methods:** Bund repairs using indigenous materials and traditional expertise, as demonstrated by experts from villages should be documented and used in bund repairs and maintenance works.
- **Regular Inspection:** to check for signs of erosion, cracks, leaks, or breaches.

Review Protocol

KMP is an attempt when khazans are in the centre of challenges both from the nature and the man-made. To built in checks and balances to this plan therefore will involve prioritising the various steps to be undertaken as Action Plan.

Besides the authority constituted for overlooking the KMP should be given adequate powers to address connected issues and report on the same. Initial review of 2 to 3 years will serve corrective purpose and later it could be considered at 5 years or at every new CZMP proposed as per effective CRZ regulations. Dynamic documentation will be key to the review protocol.

Members of the Committee

Annexure I

Constitution of the Committee


Government of Goa
Department of Environment and Climate Change
1st Floor, Pandit Deendayal Upadhyay Bhavan,
Behind Pundalik Devasthan, Near Sanjay School,
Porvorim, Bardez Goa
Phone Nos.: 0832-2416581 / 2416583 / 2416584
e-mail: dic-env.goa@gov.in

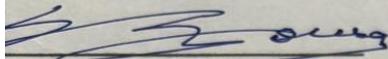
No. 2-81-2020/Dic/Envt & CC/ 577 Date: 08/ 09 / 2020

ORDER

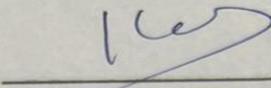
Government of Goa is pleased to constitute a Committee for Preparation of Draft Plan titled Khazan Land Management Plan comprising of the following members.

1.	Dr. Simon D'Souza Ex-Chairman, GSPCB and Scientist F, National Institute of Oceanography	- Chairman
2.	Dr. N.P.S. Varde Ex-Director, Department of Science, Technology and Environment, Govt of Goa	- Member
3.	Shri. Subrai Nadkarni, Ex-Chief Engineer, Water Resources Department	- Member
4.	Dr. Vinod Dhargalkar, Ex-Scientist, National Institute of Oceanography and Secretary of Mangrove Society of India	- Member
5.	Dr Fraddy D'Souza The Energy Research Institute (IERI) Resources	- Member
6.	Shri. Raya Shankhwalkar Hon Secretary, Heritage Network Group	- Member
7.	Shri. Shrikant. S. Priolkar Member, Khareban Tenant Association, Chodan	- Member
8.	Shri. Suraj Pagui, Akhil Goa Fisherman	- Member
9.	Shri. Bhau Kalangutkar, Chairman, Owlshwar Fisherman Society, Nerul	- Member
10.	Shri. Tolentino Fortado, Dy. Director, Department of Planning, Statistics and Evaluation	- Member
11.	Shri. Neville Alfonso, Director of Agriculture, Agriculture Department	- Member Convenor

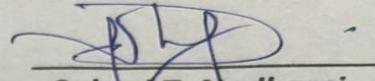
Members of the Committee



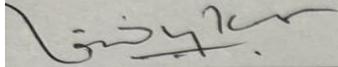
Dr Simon D'Souza
Chairman



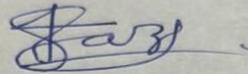
Dr Naraina P.S. Varde
Member



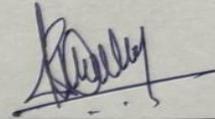
Subraj T. Nadkarni
Member



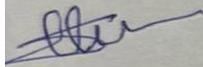
Dr Vinod Dhargalkar
Member



Dr Fraddry D'Souza
Member



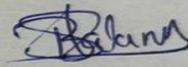
Raya Shankwalker
Member



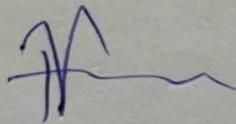
Vikrant Priolkar
Member



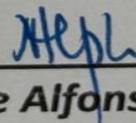
Suraj Pagi
Member



Bhau Kalangutkar
Member



Tolentino Furtado
Member



Neville Alfonso
Member Secretary

The Committee shall:-

- Call for such records as necessary and analyze all the reports, documents, studies, publications as available in respect of Khazans.
- Carry out Field visits and consultation with stake holders
- Study the present laws, rules, regulations in respect of the above subject
- Prepare Draft Plan for the Management of Khazan Land.

The Committee shall complete the above task within 45 days from the date of publication of this Order.

The Members of the Committee shall be eligible for sitting fee of Rs 2000/- per meeting and Rs 1000/- per day for inspection.

By Order and in the name of
the Governor of Goa

(Johnson Bedy Fernandes)

Director Environment and Climate Change

To,

- The Director, Government Printing Press, Panaji... .. for favor of immediate publication in the Official Gazette. The matter is checked and found fit for publication.
- Dr. Simon D'souza, Ex-Chairman, GSPCB and Scientist F, National Institute of Oceanography.
- Dr. N.P.S. Varde, Ex-Director, Department of Science Technology and Environment, Government of Goa.
- Shri. Subrai Nadkarni, Ex-Chief Engineer, Water Resources Department.
- Dr. Vinod Dhargalkar, Ex-Scientist, National Institute of Oceanography and Secretary of Mangrove Society of India.
- Dr. Fraddy D'Souza, The Energy ^{Resources} Research Institute. (TERT)
- Shri. Raya Shankhwalkar, Hon'ble Secretary, Heritage Network Group.
- Shri. Shrikant.S. Priolkar, Member, Khareban Tenant Association, Chodan.
- Shri. Suraj Pagui, Akhil Goa Fisherman.
- Shri. Bhau Kalangutkar, Chairman, Owlshwar Fisherman Society, Nerul.
- The Director, Department of Planning, Statistics and Evaluation, Porvorim
- The Director, Agriculture Department, Tonca Caranzalem-Goa.

Copy to:

- OSD to Hon'ble Minister for Environment & CC, Government of Goa, Secretariat Porvorim Goa.
- P.A to Secretary Environment & CC, Government of Goa, Secretariat, Porvorim Goa.

Annexure II

Annexure II contains list of khazans identified as per CZMP 2011 Maps

Annexure III

References:

1. Goa, Daman & Diu Agriculture Tenancy Act, 1964 and Rules, 1965
2. Report of the Agricultural Land Development panel, March 1992
3. Sangeeta M. Sonak, 2013, Khazan ecosystem of Goa, Springer
4. Sangeeta Sonak, Saltanat Kazi and Mary Abraham, 2005, Khazans in Troubled Waters, TERI Press, TERI
5. Goa-Political, The comunidades
6. Reyna Sequiera, 2013, “As Dear As Salt”, Goa 1556
7. Codigo de Comunidades
8. Anant Ramkrishna Sinai Dhume, 1986, The Cultural History of Goa (10000 BC to 1352 AD)



No. VP/SC/ 2943 / 2025-26

Ph. : 2448769

Office of the Village Panchayat
Santa-Cruz, Tiswadi-Goa.
Pin Code : 403 005

Date : 08/04/2025

O/n Member Secretary
 Goa Coastal Zone Management Authority
 C/o Department of Environment & Climate Change
 4th floor,
 Dempo Towers, Patto, Panaji-Goa. 403001

To
 The Goa Coastal Zone Management Authority
 c/o Department of Science, Environment (Govt of Goa)
 4th floor, Dempo Towers, Patto, Panaji Goa

Reg: Wrongful classification of the land surveyed of Calapor Village as Khazan Land by the Goa Coastal Zone Management Authority

Respected Sir,

As per the Resolution No. 9(12) Fortnightly Meeting of V.P Santa Cruz and the Gram Sabha members of Village Panchayat Santa Cruz (hereby "**Village Panchayat, Santa Cruz**"), who would like to bring to your notice the error made by Goa Coastal Zone Management Authority (hereby "**GCZMA**"), who have notified the land allotted to the Gram Sabha, Santa Cruz as Khazan Land. (Survey No. 531/1-A, 531/2-A (part), 532-11-A (part), 532/12-A (part), 532/13-A (part) and 532/14-A (part) of Calapor Village, Tiswadi Taluka measuring an area of 3094.00 m²) (hereby "**Survey Land**")

On 5th June 2023, the Office of the Collector, North Goa issued a Conversion Sanad granting permission to the Survey Land to be used for the purpose of Residential use with FAR 60. Annexed hereto is a copy of the Conversion Sanad dated 5th June 2023 as "**Annexure I**".

The Conversion Sanad was granted after processing of the application submitted by Village Panchayat, Santa Cruz in Schedule - I dated 23rd December 2022 along with the Land Use Zoning Report dated 9th September 2022 issued by the Deputy Town Planner, Tiswadi Taluka to the Village Panchayat showing the zone as Settlement Zone with FAR 60. Annexed hereto is a copy of the application submitted by the Village Panchayat, Santa Cruz dated 23rd December 2022 as "**Annexure II**" and copy of the Land Use Zoning Report by the Deputy Town Planner dated 9th September 2022 as "**Annexure III**".

The photographs presented along with the letter clearly show that the Survey land is barren land. Annexed hereto are the photographs of the Survey land as "**Annexure IV**".



[Signature]
 SARPANCH
 VILLAGE PANCHAYAT OF SANTA CRUZ

Office of the Village Panchayat
Santa-Cruz, Tiswadi-Goa.
Pin Code : 403 005

Date : _____

We would like to bring to your attention also the fact that the Survey Land was acquired by the Government and allotted to the Panchayat for the construction of market complex and Panchayat Ghar. Annexed hereto is the copy of the Award by the Office of Deputy Collector (Rev.) Collectorate of North Goa District, Panaji as "Annexure V".

It is also to bring to your notice that as per the Coastal Regulation Zone (Amendment) Notification, 2019, (hereby "CRZ Notification, 2019") the said land does not fall under the fall under any the restricted categories or under the ecologically sensitive areas/coastal land use. Annexed hereto are the relevant sections of the CZR Notification, 2019 and the Office Memorandum dated 26th October 2021 by the Ministry of Environment, Forest and Climate Change as "Annexure VI".

Hereby, we humbly submit to you that the GCZMA has made an error in sending a show cause notice to the Panchayat without proper investigation of the survey land.

Therefore, we humbly pray to:

1. Cancel the show cause notice by the GCZMA
2. Take any appropriate steps which deem fit.

Your's Faithfully



(Jennifer De Oliveira)

SARPANCH
 VILLAGE PANCHAYAT OF SANTA CRUZ

Cc To:

- 1) The Hon'ble Environment Minister,
 Government of Goa,
 Secretariat, Porvorim,
 Alto Porvorim, Penha de Franca,
 Goa - 403521
- 2) Office File

