GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION NO. 2874
TO BE ANSWERED ON WEDNESDAY, 17TH DECEMBER, 2025

SALINISATION OF COASTAL REGIONS IN KERALA

2874. DR. M P ABDUSSAMAD SAMADANI:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether the Government has taken note of the increasing salinization of coastal regions in Kerala, especially Alappuzha, Ernakulam, Thrissur, Malappuram, Kozhikode, and Kasaragod arising from sea-level rise, tidal ingress, storm surges and changing coastal geomorphology and if so, the details thereof; and

(b) whether the Indian National Centre for Ocean Information Services (INCOIS), National Centre for Coastal Research (NCCR) or any allied institutions have conducted recent studies on the rate, pattern and long-term projections of salinity intrusion affecting coastal soil and groundwater and if so, the details thereof along with the scientific assessment of its impact on agriculture, drinking-water security and coastal ecosystem?

ANSWER
THE MINISTER OF STATE (INDEPENDENT CHARGE) FOR
MINISTRY OF SCIENCE AND TECHNOLOGY
AND EARTH SCIENCES
(DR. JITENDRA SINGH)

(a) Yes Sir. Ministry of Water Resources has examined the problem of land salination along the Indian coast including Kerela and suggested remedies. Following this, Central Water Commission (CWC) has published the report titled 'Problems of Salination of Land in Coastal Areas of India and Suitable Protection Measures', in 2017. The report can be accessed at https://cwc.gov.in/sites/default/files/Salinity_Report_Hydrology_CWC.pdf. Kerala, with a coastline of about 560 km, faces seasonal yet significant salinity intrusion, particularly during periods of low rainfall, with saline water ingressing more than 30 km inland through several rivers. Low-lying coastal stretches, inland water bodies, and districts such as Kuttanad, Alappuzha district—where groundwater levels lie below mean sea level—are highly vulnerable, resulting in adverse impacts on drinking water supply, industrial water abstraction, freshwater fish habitats, and paddy cultivation in estuarine and lake-adjacent regions. Uncontrolled sand mining and dredging have further aggravated the problem.

The district-wise area affected by salinity is given in the below table.

District	Affected Area (sq km)
Kasaragod	30.50
Kannur	23.30

District	Affected Area (sq km)
Kozhikode	40.00
Malappuram	45.70
Thrissur	110.00
Ernakulam	687.51
Kottayam	80.62
Alappuzha	446.00
Kollam	29.00
TOTAL	**1492.63**

(b) No Sir. The Indian National Centre for Ocean Information Services (INCOIS), National Centre for Coastal Research (NCCR) has not undertaken studies on the rate, pattern and long-term projections of salinity intrusion affecting coastal soil and groundwater. However, National Centre for Earth Science Studies (NCESS), Thiruvananthapuram, an autonomous body under Ministry of Earth Sciences has been carrying out systematic research on groundwater salinity and seawater intrusion along the Kerala coast over the past several years, with a major focus on understanding how coastal processes influence freshwater aquifers. Its studies have covered stretches such as Pozhiyoor–Kappil and other vulnerable coastal belts, where groundwater levels, electrical conductivity, TDS, salinity, and hydro-chemical signatures were monitored through repeated field surveys in both shallow and deep wells. The findings consistently show that wells closer to the shoreline and deeper aquifer zones exhibit elevated salinity due to seawater ingress, while site-specific variations reflect complex interactions between geology, recharge, and tidal influences. These studies collectively demonstrate how coastal processes, sea-level dynamics, subsurface lithology, and aquifer conditions contribute to groundwater salinity changes, and they provide essential baseline information for assessing vulnerability and managing coastal groundwater resources in Kerala. As per the CWC report 'Problems of Salination of Land in Coastal Areas of India and Suitable Protection Measures', in 2017, indicate that salinity intrusion in coastal areas adversely impacts agriculture, drinking-water security and coastal ecosystems. Salinity in rivers and shallow aquifers up to 30 km inland affects agricultural production, reducing crop growth and yields due to poor water and nutrient uptake, and can render farmlands unfit for cultivation. Intrusion of saline water into groundwater makes drinking-water supplies unreliable, increasing treatment costs and causing shortages in summer, particularly in low lying coastal regions. Coastal ecosystems, including wetlands and vegetation, also suffer from increased salinity, leading to reduced biodiversity, plant mortality, and dominance of salt tolerant species.

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