

Is Bangladesh at High Risk of Dead Zone Expansion in the BoB

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It is well known that a team of international scientists, Bristow et al. (2016), have discovered a Dead Zone in the Bay of Bengal (BoB) that is roughly half the size of Bangladesh and is located at depths of 70 meters and below with the minimum oxygen level. Though there is a lot of controversy on the existence of the dead zone in the Bay of Bengal, some astonishing reports on the formation of the dead zone situated in the centre of the Bay of Bengal and already expanded to a massive 6000 square kilometres is an alarm for the world. There were only three significant dead zones, one in the Arabian Sea and two in the eastern tropical Pacific (off Mexico and Peru/Chile). A combined study by the University of Southern Denmark, the Max Planck Institute for Marine Microbiology in Bremen, Germany, and the National Institute of Oceanography (NIO), Goa, India, adds the newly discovered dead zone in BoB to this list.

Generally, eutrophication is responsible for developing a dead zone in which an increase in the levels of nutrients, mainly nitrogen and phosphorus lead to a significant increase in the growth of aquatic plants and algae. This overabundance of plant and algae growth depletes the water's oxygen levels, creating a "dead zone" where very little or no aquatic life can survive. This occurs because the decomposition of the excess plant and algae matter consumes all the available oxygen in the water, leaving no oxygen for other aquatic organisms to breathe. And dead zone expansion about what I am going to discuss is the consequence of the increased size and frequency of dead zones in marine environments. Dead zone expansion is very rapid and quite complex to handle. If we neglect the discovered dead zone, it will

rapidly expand. Namal Rajapaksa (2019) highlighted in an article that the expansion of this dead zone would have a severe impact on six different nations as the recently examined dead zone is positioned east of India, northeast of Sri Lanka, south of Bangladesh and west of Thailand, Indonesia and Myanmar. It is clear that Bangladesh is one of the countries that will be under the severe impact of the newly discovered dead zone in the Bay of Bengal. In Bangladesh, the situation will be particularly difficult and exacerbate the already dire environmental and health problems the country faces.

One of the main drivers of the dead zone in the Bay of Bengal may be the massive amounts of nutrients and other pollutants released into the ocean. The primary source of these pollutants is the extensive agriculture industry in Bangladesh and littorals, which utilises large amounts of fertilizers and other chemicals that eventually make their way into the ocean. Additionally, the rapid expansion of urban areas in Bangladesh and other coastal regions contributes to the problem, as sewage and other forms of pollutants are being released into the ocean.

Likely, the expansion of the dead zone will happen if the ongoing pollution is not controlled properly, and Bangladesh is on the red list of severe impacts as I have already mentioned. In Bangladesh, most coastal people heavily depend on the Bay of Bengal for their food security, livelihoods and economy. A large proportion of the population is directly or indirectly involved in fisheries and farming. The reduced oxygen levels in the water due to the dead zone can harm or kill marine life, minimize fish catch and disrupt the food chain, which can seriously affect the people and communities who depend on the Bay of Bengal for their livelihoods and food security. In reality, as effective measures have yet to be taken to control pollution or retrieve the existing dead zone, the phenomenon of dead zone expansion is not uncommon. In Bangladesh, the situation will be particularly dire due to the country's already high environmental degradation and poverty levels. Therefore, Bangladesh needs to address the dead zone issue and work towards reducing its impact on the country. Handling the case of the dead zone and decreasing nutrient pollution will be crucial in mitigating the effects of climate change and preserving the health of the Bay of Bengal ecosystem. Truly, the expansion of the dead zone in the Bay of Bengal is a complex and pressing environmental crisis that demands immediate attention and action. With the right efforts and investments, it will be possible to turn the tide on this ecological disaster and ensure a healthy and sustainable future for the Bay of Bengal and its surrounding communities.

To address this growing crisis, both local and international efforts must be made to reduce the levels of pollutants released into the ocean. It will require a combination of measures, including increased regulation of the agriculture industry, improved sewage treatment and management, and greater investment in clean technologies and infrastructure. Governments and other groups must collaborate to inform the public about the risks posed by pollution and the value of environmental protection. In addition, more funding should be allocated to scientific research to comprehend the causes and effects of the dead zone in the Bay of Bengal. This study can contribute to the creation of practical solutions and assist in spreading awareness of the issue.

Along with that, science should be environmentally effective in the world's present context. It is true that with the increasing population in Bangladesh, there is a need for more food production in limited lands. Farmers use large amounts of fertilizer to increase crop yields and aquaculture production to meet this demand. However, this has increased nutrient inputs into the Bay of Bengal, which will contribute to the dead zone expansion. Science and technology can be crucial in finding environmentally sustainable solutions to the present world crisis. For example, precision agriculture techniques can be used to minimise fertilizer use and reduce nutrient runoff into the bay. The development of alternative fertilizers and better management practices can also reduce the impact of agriculture on the environment.

Additionally, using advanced wastewater treatment systems can help reduce the number of nutrients entering the bay from sewage and industrial sources. The goal should be to balance food production with environmental protection so that future generations can enjoy the benefits of a healthy ecosystem. Furthermore, monitoring and tracking the situation over time will be important to ensure progress in reducing the dead zone's size. Regular reporting of the levels of pollutants in the ocean, as well as through regular assessments of the health of the region's ecosystem and its impact on the local economy and health, will help to improve the present challenge.

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