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Nanobubble ozonation for waterbody rejuvenation at different locations in India: A holistic and sustainable approach

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In this study, four different sites of ponds at different time period were analysed to show to the effect of Nanobubble ozonation (NBO). NBO is one of novel technologies which is environmentally friendly only using air, ozone, and requiring virtually no chemicals. All the case studies have been performed in real time in different seasons and locations which gives the idea of importance of NBO for the treatment of water bodies with completely natural, environmentally sustainable, cost effective, and less time-consuming technology. Three case studies have been investigated *in-situ* (Site 1, 2, 4) and one ex-*situ* (site-3), which verify the efficacy of NBO in treating pond water. NBO treated water was determined to be in the standard limits, odour was eliminated, and water was cleaned enough to be consumed by the animals. The test results show that ozone nanobubble (NBO) in wastewater treatments achieved 85–99% reduction in total soluble solids (TSS), 80–90% reduction in biochemical oxygen demand (BOD), and 55% chemical oxygen demand (COD) reduction at site 3 and 82% COD reduction at site 4. Improved dissolved oxygen suitable for the living beings was achieved. Hence, this paper emphasizes the efficacy of NBO treatment to reclaim the water bodies and ecological restoration and to achieve the sustainable goals of clean water and environmental sustainability. DO level in all the ponds improved significantly after NBO treatment and showed the value of 14.5 mg/L when measured even after 50 h. Nanobubble gas dissolution system not only able to improve the dissolved oxygen up to supersaturation level but also able to retain it consistent more than 14–15 h. The vary reason for maintaining such consistency is the size of nanobubbles which is around <0.5 μm and NB doesn't follow the buoyancy, hence move in water in Brownian motion. NBG systems are future of our lakes and ponds rejuvenation and maintain the water quality.