



## Harmful Algal blooms (HABs) and Its Effects on Aquatic Life in Shakambhari Conservation Reserve of Sikar and Jhunjhunu District, Rajasthan

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### INTRODUCTION

2 may 2022, after some time there are formed algal bloom that is known as Harmful algal blooms on a pond surface in shakambari conservation Reserve of Rajasthan. Harmful Algal blooms (HABs.) also known as Red Tides. Some algae can toxic that cause algal bloom and can leads to collapse entire aquatic Ecosystem typically as a result of the transfer of toxins through the food web. Sometimes the direct release of toxic compounds can be lethal to marine animals. These phenomena are caused by blooms of microscopic algae. Non-toxic HABs cause damage to ecosystems, fisheries resources, and recreational facilities, often due to the sheer biomass of the accumulated algae. The term “HABs” also applies to non-toxic blooms of algae which can cause major ecological impacts such as the displacement of aquatic life HABs alter and oxygen depletion in bottom waters. The nature of HABS problem has changed over the last some decades. The resulting economic losses, resources affected, and the number of toxins and toxic species are all increased dominant. Human activities are also affected from Harmful algal blooms because Humans have contributed by transporting toxic species by water and by adding large quantities of industrial, agricultural and sewage effluents to waters bodies. In many urbanized coastal regions these inputs have altered the size and composition of the nutrient elements which has created more favorable nutrient environment for HABS species in shakambhari conservation reserve . The study explain the use of fertilizers for agricultural production represents a large source of nutrients in pond waters that promote some HABs. The diversity in HABS species and their impacts presents a significant challenge to those responsible for the management of coastal resources. Furthermore, HABs are complex oceanographic phenomena that require multidisciplinary study.

Our understanding of these phenomena is increasing dramatically, and with this understanding come technologies and management tools that can reduce HABS incidence and impact. Here I summarize the global HABS problem, its trends and causes, and new technologies and approaches to monitoring, control and management,

highlighting molecular probes for cell detection, rapid and sensitive toxin assays, remote sensing detection and tracking of blooms, bloom control and mitigation strategies, and the use of large-scale physical/biological models to analyze past blooms and forecast future ones.



### 1. HABS impacts

When toxic phytoplankton are filtered from the water as food by aquatic organism their toxins transfer in those aquatic organisms that can be lethal to humans or other consumers. The poisoning effects that have been given the names - diarrhetic, neurotoxic, amnesic, and azaspiracid Aquatic ecosystem poisoning (NSP, ASP, DSP and AZP respectively). Except for ASP, all are caused by biotoxins synthesized by a class of marine algae called dinoflagellates. The ASP toxin, domoic acid, is produced by diatoms that until recently were thought to be free of toxins. A sixth human illness, ciguatera fish poisoning (CFP) is caused by toxins produced by dinoflagellates that live on surfaces in many coral reef communities. Ciguatoxins are transferred through the food chain from

herbivorous reef fishes to larger carnivorous, often commercially valuable finfish. Another type of HABS impact occurs when marine fauna are killed by algal species that release toxins and other compounds into the water. Fish and shrimp mortalities from these types of HABS have increased considerably at aquaculture sites in recent years. HABS also cause mortalities of wild fish, seabirds, whales, dolphins, and other marine animals, typically as a result of the transfer of toxins through the food web .Non-toxic blooms of algae can cause harm in a variety of ways. One prominent mechanism relates to the high biomass that some blooms achieve. When this biomass decays as the bloom terminates, oxygen is consumed, leading to widespread mortalities of plants and animals in the affected area.



The global expansion in the distribution of PSP toxins –The first thought of many is that pollution or other human activities are involved, and this is indeed a factor in some areas. Many HABS species can thrive on the nitrogen and phosphorous commonly found in agricultural, sewage and industrial discharges. On close inspection, however, some of the “new” or expanded HABS problems have occurred in waters where pollution is not an obvious factor. The organisms responsible for HABS have been on earth for thousands or even millions of years, during which time they had ample opportunities to disperse, assisted by changing climate, movement of tectonic plates, and other global changes. Some new bloom events may thus reflect indigenous populations that are discovered because of

better detection methods and more observers.

## 2. Management issues

This diversity in blooms and their impacts presents a significant challenge to those responsible for the management of water resources affected by HABS. The strategies needed to protect fisheries, minimize economic and ecosystem losses, and protect public health vary considerably among locations and among HABS types. A recent review highlights the many different strategies adopted by countries and commercial enterprises worldwide to monitor and manage HABS in coastal waters. A secchi disk method introduced to know the water quality and algal density : -



## CONCLUSIONS

Harmful Algal Blooms occur naturally in the water bodies. Micro algae or microscopic algae present in every water habitats in very low amount. Present study on algal blooms and find major algae that formed algal blooms in Shakambari conservation reserves. The algal diversity survey revealed as the presence of 13 species of algae. Among them Cyanophyceae dominant and toxic algal blooms formed by them. The investigation shows that Cyanophyceae class of Algae show all the characters with water parameters. When the conditions are favorable then algae reproduce rapidly that cause population explosion and formed Harmful algal blooms. The bloom may discolor the water. The water can become yellow- green, orange-brown, or even red-green. Harmful algal bloom cause fish killing, colaps in aquatic Ecosystem and illness in Human. After formation of algal bloom the level of water pollution is increased and level of oxygen is decreased.

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