



## News Analysis (24 Oct, 2018)

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### 3rd International Year of Reef

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The 3-day International Conference on Status and Protection of Coral Reefs (STAPCOR 2018) with the theme **“Reef for Life”** begun in Lakshadweep.

- The conference is organized by Zoological Survey of India.
- **International Coral Reef Initiative (ICRI)** has declared 2018 as the third International Year of the Reef (IYOR).
- The International Year of the Reef (IYOR) 2018 is a year-long campaign of events and initiatives to promote coral reef conservation.

### The Objective of IYOR 2018 is to

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- Strengthen awareness globally about the value of, and threats to, coral reefs and their associated ecosystems
- Promote partnerships between Governments, the private sector, academia and civil society on the management of coral reefs
- Identify and implement effective management strategies for conservation, increased resiliency and sustainable use of these ecosystems and promoting best practices
- Share information on best practices in relation to sustainable coral reef management.

### International Year of the Reef

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- **IYOR was first declared in 1997** International Coral Reef Initiative in response to the increasing threats on coral reefs and their associated ecosystems, such as mangrove forests and seagrass beds.
- The International Coral Reef Initiative designated **2008 as the second International Year of the Reef.**

### What are Corals?

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- Corals are made up of genetically identical organisms called **polyps**. These polyps have microscopic algae called zooxanthellae living within their tissues.
- The **corals** and **algae have a mutualistic relationship**.
- The coral provides the **zooxanthellae** with the **compounds necessary for photosynthesis**. In return, the zooxanthellae supply the coral with organic products of photosynthesis, like carbohydrates, which are utilized by the coral polyps for the synthesis of their calcium carbonate skeletons.
- In addition to providing corals with essential nutrients, zooxanthellae are responsible for the unique and beautiful colors of corals.
- They are also called the **“rainforests of the seas”**.
- There are 2 types of corals:
  - **Hard**, shallow-water corals—the kind that builds reefs.
  - **Soft** corals and deepwater corals that live in dark cold waters.

## Benefits of Coral

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- **Habitat:** Corals are home to over 1 million diverse aquatic species, including thousands of fish species.
- **Income:** Coral reefs and related ecosystems have a global estimated value of ‘\$2.7 trillion per year, or 2.2% of all global ecosystem service values’, this includes tourism and food.
- **Coastal protection:** Coral reefs reduce shoreline erosion by absorbing energy from the waves: they can protect coastal housing, agricultural land, and beaches.
- **Medicine:** Reefs are home to species that have the potential for treatments for some of the world’s most prevalent and dangerous illnesses and diseases.

## Threat to Corals

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- **Overfishing:**

Overfishing of certain species on or adjacent to coral reefs can affect the reef’s ecological balance and biodiversity. For example, overfishing of herbivorous fish can lead to high levels of algal growth.
- **Destructive fishing methods:**

Fishing with dynamite, cyanide, bottom trawling and Muro Ami (banging on the reef with sticks) can damage entire reefs and is unsustainable.
- **Recreational activities:**

Unregulated recreational activities and tourism cause damage to the very environment upon which the industries depend. Physical damage to the coral reefs can occur through contact from careless swimmers, divers, and poorly placed boat anchors.

- **Coastal development:**

Coastal areas have some of the fastest rates of growth in tropical countries. Airports and buildings are often built on land reclaimed from the sea. Sensitive habitats are destroyed or disturbed by the dredging of deep-water channels or marinas, and through the dumping of waste materials.

- **Pollution:**

Urban and industrial waste, sewage, agrochemicals, and oil pollution are poisoning reefs. These toxins are dumped directly into the ocean or carried by river systems from sources upstream. Some pollutants, such as sewage and runoff from farming, increase the level of nitrogen in seawater, causing an overgrowth of algae, which 'smothers' reefs by cutting off their sunlight.

- **Climate Change:**

- **Coral Bleaching**

Coral bleaching is the loss of the algae and a rapid whitening of the coral. This is a stress response by the coral host that can be caused by various factors such as the rise in sea surface temperature. If the temperature decreases, the stressed coral can recover; if it persists, the affected colony can die.

- **Ocean Acidification**

The decrease in the pH of the Earth's oceans, caused by their uptake of anthropogenic CO<sub>2</sub> from the atmosphere is known as Ocean Acidification. The decrease in pH has negative consequences for oceanic calcifying organisms such as coral reefs.

- **Illegal Wildlife Trade**

- The Aquarium trade is a multi-million dollar industry. Tropical fish and corals are removed from reefs, often illegally and through damaging methods, and sold to aquariums all over the world.
- All hard corals have been listed on Appendix II of Convention on International Trade in Endangered Species (CITES) since 1985, meaning any trade must be regulated and requires strict permits.

## **International Coral Reef Initiative**

- The International Coral Reef Initiative (ICRI) is an **informal partnership between Nations and organizations** which strives to preserve coral reefs and related ecosystems around the world. Its decisions are not binding on its members.
- The Initiative was **founded** in **1994** by eight governments: Australia, France, Japan, Jamaica, the Philippines, Sweden, the United Kingdom, and the United States of America.

- It was announced at the First Conference of the Parties of the Convention on Biological Diversity in December 1994, and at the high-level segment of the Intersessional Meeting of the U.N. Commission on Sustainable Development in April 1995.
  - ICRI now have more than 60 members including India.
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## 3D Bioprinting to Create Artificial Blood Vessels

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Scientists have developed a 3D printing technique that can recreate the complex geometry of blood vessels, and could one day be used to produce artificial arteries and organ tissues.

- 3D printing (also known as **additive manufacturing**) is a manufacturing process through which three-dimensional (3D) solid objects are created.
- It enables the creation of physical 3D models of objects using a series of additive or layered development framework, where layers are laid down in succession to create a complete 3D object.

## Recent Development in 3D bioprinting

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- The idea behind 3D bioprinting was to add independent mechanical properties to 3D structures that can mimic the body's natural tissue. This technology allows the creation of microstructures that can be customized for disease models.
- Hardened blood vessels are associated with cardiovascular disease and engineering a solution for viable artery and tissue replacement has historically proven challenging. To overcome these hurdles, researchers found a unique way to take advantage of oxygen's role in setting the final form of a 3D-printed structure.
- By keeping tight control over oxygen migration and its subsequent light exposure, researchers have the freedom to control which areas of an object are solidified to be harder or softer all while keeping the overall geometry the same.
- This is an encouraging first step towards the goal of creating structures that function like a healthy cell should function.
- As a demonstration, the researchers printed a small Chinese warrior figure, printing it so that the outer layers remained hard while the interior remained soft.
- The researchers are optimistic that future studies will help improve the capabilities even further. The findings could lead to better, more personalized treatments for those suffering from hypertension and other vascular diseases.

## Potential of 3D printing

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- Car and aircraft manufacturers have taken the lead in 3-D manufacturing, using the technology to transform design and production. For eg. Boeing is using 3D-printed titanium parts in the construction of its 787 Dreamliner airliner, The U.S. and Israeli air forces are already using 3D printers to manufacture spare parts etc.
  - In medical sciences, 3D printing is being used to customize implants and this technology could soon revolutionize dentistry. In the future, organs and body parts may be created using 3D printing techniques.
  - In fashion, Nike, Adidas, and New Balance are using 3D printing to create prototypes faster than ever, and create customized shoes. In 2018, Nike revealed it had made the first 3D-printed textile upper in performance footwear, called Flyprint.
  - In the construction industry, companies around the world are making breakthroughs in 3D-home printing. Using layers of concrete, homes can be built in 48 hours, which are stronger than the regular cinder block and only a fraction of the price.
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## SC Order on Crackers During Diwali

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Supreme Court has refused to put a blanket ban on use of crackers during diwali. The Court has struck a balance between the interests of the firecracker industry and the right to public health.

### Key points from SC Orders:

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- Time limit on bursting crackers: On the day of Deepavali: 8 p.m. to 10 p.m. On Christmas and New Years Eve from 11:55 p.m. to 12:30 a.m.
- Petroleum and Explosive Safety Organisation (PESO) will review the composition of fireworks to test for the presence of banned chemicals like lithium, arsenic, lead, and mercury.
- PESO will also ensure that only those crackers whose decibel (sound) levels are within the limits are allowed in the market.
- Ban on use of barium salts in crackers, series crackers called laris.
- Use of Reduced Emission Firecrackers (Green Crackers): Use of low emission crackers with PM reduction by 30-35% and a significant reduction in NOx and SO2.
- The online sale of firecrackers through e-commerce sites has been banned.

### Background

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- On October 9, 2017, the Supreme Court temporarily banned the sale of firecrackers ahead of Diwali in Delhi-NCR.
- The court had said that the limited ban on firecrackers during Diwali was an experiment to examine its effect on the pollution levels.

- The court had said that Article 21 (right to life) of the Constitution applies to both segments of people (firecracker manufacturers and the general public) and it needs to maintain a balance while considering a countrywide ban on firecrackers. For this, the court also asked the central government to suggest ways through which pollution can be curbed and what will be the effect of firecrackers on the public at large.

## Green Crackers

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- “Green crackers” are so named because they do not contain harmful chemicals that would cause air pollution. Components in firecrackers are replaced with others that are **“less dangerous” and “less harmful” to the atmosphere.**
- Scientists at Central Electrochemical Research Institute (CECRI), Indian Institute of Chemical Technology, National Botanical Research Institute and National Chemical Laboratory have developed few “Green Crackers” such as Safe Water Releaser (SWAS), Safe Thermite Cracker (STAR) and Safe Minimal Aluminium (SAFAL).
- They have the unique property of releasing water vapor and/or air as the dust suppressant and diluent for gaseous emissions and have matching performance in sound with conventional crackers.

### Harit Diwali Swasth Diwali Campaign

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## Important Facts for Prelims (24th October 2018)

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### World's Longest Sea-Crossing Bridge

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- Recently Chinese President Xi Jinping opened the world’s longest sea-crossing bridge (55 km) connecting Hong Kong, Macau, and Zhuhai city in mainland China.
- However, the bridge is also being seen as a part of a multi-pronged push by China to exert greater control over Hong Kong, which returned from British to Chinese rule in 1997 amid promises to preserve the city's high degree of autonomy and individual freedoms denied in mainland China.
- The bridge was first proposed in the late 1980s, but it was opposed at the time by Hong Kong’s British colonial government, which was wary of development that might draw the city closer to Communist China.
- The "Greater Bay Area" refers to the Chinese government's scheme to link the cities of Hong Kong, Macau, Guangzhou, Shenzhen, Zhuhai, Foshan, Zhongshan, Dongguan, Huizhou, Jiangmen, and Zhaoqing into an integrated economic and business hub.

## Asia Economic Integration Report

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- **Asia Development Bank** has released **Asia Economic Integration Report (AEIR)** 2018 which is released annually since 2015.
  - The Asian Economic Integration Report reviews the progress of Asian governments' efforts to integrate their economies and improve cooperation on a variety of levels.
  - In 2017, ADB released its **Asia-Pacific Regional Cooperation and Integration Index (ARCII) as a part of AEIR** for first time.
  - ARCII gauge the degree of regional cooperation and integration in Asia and the Pacific.
  - According to the AEIR 2018, Asia continued as the largest source of international migrants in 2017. Most of the international migrants in 2017 were from India(17 million), followed by China (10 million) and Bangladesh (7.5 million).
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