(IH/03/202)

Q. Researchers from the National Institute of Oceanography will work on a research project to reveal the internal working of the ocean at cellular level. In this context, analyse the various outcomes of the project. (200 words).

A. Thirty-member team of the National Institute of Oceanography (Panaji) will work on a research project to reveal the working of the ocean at a cellular level, on board the Sindhu Sadhana vessel, traversing 10,000 nautical miles (from Vishakpatnam, Australia, Mauritius and Indo-Pakistan border route). (2-3 year project)

Objective -

1. To understand the biochemistry of the ocean
2. To understand the ocean's response to climate change,
3. nutrient stress and increased pollution.

How -

1. Collecting samples of ocean water from various stretches of the ocean for genome mapping (of bacteria's DNA, RNA)
2. Sample collected at 5km depth

Possible outcomes :

1. Learning about the internal working system of the Indian Ocean - will help better conservation of biodiversity and natural cycle
2. Learning to identify the factors controlling changes in RNA and DNA of ocean life - will help us understand effects of climate change
3. Learning how microbes have adapted to the presence of micronutrients such as nitrates, sulphates and silicates; and minerals like iron ore and zinc; and trace metals like cadmium and copper; and carbon dioxide - help us mitigate climate change, bioremediation.
4. Mapping the mineral content in the ~~ocean~~ various parts of the ocean. - for future mineral exploration, mining activity
5. Finding the cause of this distribution pattern of minerals - mineral exploration becomes easier
6. Use of RNA and DNA library of oceans to apply in - commercial biotechnology applications, anticancer treatment, cosmetic and enzyme industry, antiviral molecule production etc.

It will help us understand the ecosystem, biology, and geochemistry of the ocean better.

Exploration of the ocean at a genetic level will result in new insights into taxonomy and adaptive capacity that can help optimize conservation efforts. And understanding the nutrients, minerals and trace metals composition will also allow us to come at an understanding of why the genetic material is distributed so