

Chapter-6
Conclusions

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In order to bring forth the carbon storage potential of the coral reefs of Gujarat, a total of 6 coral reef sites were visited for sample collection. A total of 13 cores have been procured from 6 different sites of the Gulf of Kachchh, 2 from each site except Ajad (3 cores-as one of the cores was procured less than 50%). The subsampling was carried out to collect sample powder from different length of the collected cores *i.e.*, i) Point-1: bottom of the core, ii) Point-2: bottom + 25 cm upward. In case of modern bottom date, the other end (Top) and 25 cm from it was preferred.

- **Age and Accretion rate of GoK Coral reefs**

A total of 32 samples were sent to BSIP, out of which 8 samples are modern and the age of the rest samples range between 5844 years Before Present (BP) to 1134 yr BP hence all the samples fall between mid- Holocene to modern. As per the analysis carried out by the BSIP, the oldest sample is of the Goose reef core -1 *viz.*, 5844 yr BP (GS-1 sample depth = 56 cm) as well as the youngest is also from another core of Goose *viz.*, 1134 yr BP (GS-2 sample depth = 25 cm). These analysed samples give a brief idea on the accretion rates of 12 cores out of 13 collected cores that has come out to be 0.37 mm/yr.

- **Carbon in the collected samples**

As majority of the core material was of coral origin, its chemical constitution is mainly calcium carbonate hence the inorganic carbon is taken in consideration *i.e.*, 12% (by weight). The weight of the collected samples (except DM-2) is 50.13 kg which implies 6 kg of inorganic carbon sequestered in it.

- **Carbon storage potential of the coral reefs of Gujarat and its fate**

Based on the accretion rate of the coral cores and carbon proportion in the CaCO_3 , the carbon storage potential of the coral reefs of Gujarat is 25041.60 ton Carbon per year. According to this, the coral reef will sequester approximately 2504160 ton carbon in the next century.

- **Coral bleaching**

The mass coral bleaching in the GoK from Poshitra in 2010, its co-occurrence with the global mass coral bleaching events caused by the elevated SST lead to conclude that coral bleaching of 2010, 2013 and 2014 is probably the consequence of the high summer SST at the GoK. However, detailed monitoring on the events of coral bleaching with region

specific factors, covering larger area and different seasons is required to be studied which in turn will provide the reef resilience of the GoK. As far as the *Porites* is concerned, the study shows that a different metabolic pathway and less dependency on heterotrophy during disturbed conditions make the species recover slower than other species. *Porites* is an important reef builder as well as it plays a significant role in the community structuring of the coral reefs of the Gulf of Kachchh. Hence, threats to its crucial biological processes like reproduction and sediment removal will show adverse impacts on the species survival including affects to a number of reef associates.