

Preface

There is a growing recognition that reduced diversity makes the world and its inhabitants increasingly vulnerable to natural and human-induced changes. The high level of biodiversity is considered as the essential requirement for the resilience of the marine ecosystems which ecosystems possess numerous benefits to the countries having long maritime boundaries, such as in the Asia-Pacific region. The region has been observed to have a high population growth and economic growth projected to reach 5.5 percent in 2017 and 5.4 percent in 2018. Many coastal lands and their adjacent seas in the region, including tropical coasts, are ecologically productive, biologically diverse and climatically and physically attractive. Various pathways of connectivity occur between the socials inhabiting this area. Some of these pathways are seen for example through hydrographic – meteorological – oceanographic – linkages that mediate dynamics of nature of the ecosystems' productivity and movement of its biological resources. Indeed, the seas and oceans offer more of a linkage than a barrier to its people and its ecosystems.

The high productive marine ecosystems provide an important life support system to the coastal states especially through food from fisheries. The marine farming is another fast-growing sector of the national economy for the region. However, this productive industry needs professional ecological management studying the prediction models of the eutrophication consequences for the marine bioresources in the local and large-scale areas with intensive farming in the sea. The shelf areas and coral reefs, being the cradle of fish reproduction and fattening, represent a complicated ecosystem. Such ecosystems provide the full life cycle for the numerous invertebrates and algae

which are widely used as food sources, in particular, as a source for the cheap protein diet. The overpressure and overconsumption of fish, mollusks, holothurians, worms, lobsters and other can lead to the homogeneity of the structure of these ecosystems instead of their high biodiversity. The high biodiversity of the coastal marine communities and coral reefs in the region is closely related to this environmental multiformity and gives them resilience and ability to recover.

The study of the relations between the environmental factors and biodiversity in the marine ecosystems shows very diverse conditions for the plants and animals – i.e. the different bottoms, seasonal wave activity, the different level of the water exchange, and different levels of sedimentation influx from the rivers' discharge.

The joint efforts of the managers, policy-makers, ecologists and biologists are needed to be united in the whole Asia-Pacific region to trace the global and local trends and perspectives in the biodiversity change in the sea.

As our institutions and universities from China, Philippines, Russia and Vietnam play an important role in the study of marine biodiversity in the Asia-Pacific region, the collaboration between our specialists is more and more essential to reveal the changes on marine biodiversity and resources under the pressure of the global change in the world. Perceiving this amenability, a series of research on marine ecology and biodiversity in the region were conducted in our institutions in recent years. To mark the progress in the last two years, we decided to hold an international conferences and multi-functional discussions along with a range of the joint studies and programs with the support of the APN (Asia Pacific Network for the Global Change research) Project (No. CAF2016-RR08-CMY), the Strategic Priority Research Program of the Chinese Academy of Sciences "Western Pacific Ocean System: Structure, Dynamics and Consequences" (No. XDA11020305), the National Basic Research Program of China (No. 2014CB441504) and the State Oceanic Administration Program "Global Change and Air Sea Interaction" (GASI-02-PAC-STWsum).

This time, the present book focuses on comparison research between marine communities in the Asia-Pacific region, and the relationship between plankton-and-benthos distribution and environmental fluctuations, including climate change. Based on this, the effect of global change on marine biodiversity, and the effect of biodiversity change on marine biological resource will be understood further. More than 100 scientists and practitioners from our countries participated in these discussions, and we would like to share important research findings for the region. The output of this book is expected to provide scientific support for the development and management of the Asia-Pacific marine ecosystems.

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