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1. Introduction

On November 19, 2021, the Island Research Center (IRC) of the Ministry of Natural Resources of China (MNR) and the China Ocean Development Foundation jointly hosted the International Forum on Island Ecological Protection 2021 with the theme of ‘Nature-based Island Ecological Restoration and Management Practices.’ The Third Institute of Oceanology, MNR, Xiamen Center for International Ocean Cooperation, and the Center for Pacific Island Studies at Liaocheng University participated in the conference and co-organized the forum. As a part of the Xiamen International Ocean Week 2021, the forum was held in a hybrid format, with some participants participating online and others attending in person. Nearly 400 representatives from government agencies, research institutions and universities around the world attended the forum to discuss issues related to global island protection and sustainable development.

During the opening ceremony, Danhong Chen, MNR’s Deputy Director-General for the International Cooperation, noted that China and island countries (regions) share common concerns related to climate change, biodiversity conservation, and blue economic development. Common solutions are also apparent, including strengthening policy planning coordination, expanding green cooperation, enhancing island resilience [1], and improving the ability of island countries (regions) to cope with marine disasters and climate change. The Minister of the Embassy of Papua New Guinea to China, Vincent W. Semale, indicated his willingness to build a community of shared future between China and Papua New Guinea and implement the global development initiative. Vice President Xinchun Fan of the China Ocean Development Foundation, stated that the China Ocean Development Foundation is committed to pooling international resources and places a high value on conducting cooperative research with island countries (regions) on topics of common interest. Dr. Guo Haibo, Director of the Island Protection and Utilization Division in the Department of Sea Area and Island Management, MNR, suggested enhancing the sharing and exchange of island management experiences based on an ecosystem approach, and developing a sustainable island development model that can be shared and replicated. In his remarks, Haifeng Zhang, Director-General of the IRC, mentioned that the IRC would like to jointly establish a platform of China-Island National Marine Science and Technology Exchange Center, which would be used to develop a global cooperation mechanism for island sustainable development and to share research achievements.

Every year since 2016, the IRC has organized high-level international island forums with relevant agencies (suspended in 2020 due to COVID-19) to address key issues related to island conservation and sustainable development. In 2021, the forum was limited in length and the number of presenters due to the COVID pandemic. To meet the needs of experience sharing, the forum added a wall newspaper display, paper abstract displays, and other means of communication. The forum outlined experience in island protection and sustainable development and offered constructive suggestions for scholars from throughout the world to study and discuss.

2. New issues on sustainable island development under the impact of the COVID-19 pandemic

Professor James Randall, from the University of Prince Edward Island in Canada, highlighted the COVID-19 pandemic affecting islands and island government decision-making. Using the COVID-19 Island Insights Series prepared by experts from 24 islands served as the analytical data, he identified the major concerns of island governments as follows: (1) Adopt a more strategic approach to tourism marketing; (2) Accelerate the transition from non-renewable to renewable sources of energy; (3) Pay more attention to food security; (4) Strengthen the primary/
preventive health care model; (5) Strengthen coordination with nearby jurisdictions, including countries and sub-national political entities; (6) Match decision-making responsibilities to local realities and contexts; and (7) Reduce social inequalities [2,3]. These policy goals are tightly related to the ongoing progress towards achieving the Sustainable Development Goals (SDGs) by 2030. A Reader at Newcastle University, Dr. Sue Farran, believes that Pacific island states have more sea than land, but in light of man-made pollution, rising sea levels, and COVID-19, Pacific islanders view themselves as guardians of the Pacific Ocean. In addition to being a heritage of mankind, the Pacific Ocean is the home to approximately 6.6 million Pacific Islanders, which is why the ‘Blue Pacific’ will serve as a constant strategic framework and will be upheld in the long term [4]. A study conducted by Dr. Adam Grydehøj from South China University of Technology, China/Island Dynamics, Denmark and Dr. Ilan Kelman from University College London, based on the global issue of sustainability, analyzed the co-development of islands. They argue that efforts at achieving sustainability at the island level are often focused on producing visible and marketable results, without necessarily contributing much to the island community or doing much to preserve the island ecosystem. In particular, island-level efforts at climate change mitigation have a negligible impact on the global environment. Too often, islands focus on “conspicuous sustainability” initiatives. The implementation of sustainable development initiatives in island areas should be tailored to local conditions [5]. Dr. John N. Telesford, from the T. A. Marrnyshow Community College in Grenada, measured the progress towards sustainable island development in terms of the interrelationship between islands, their coasts and oceans [6]. Using indicators of sustainable development, he compared and analyzed the situation of small island states in the Caribbean, Mediterranean and Pacific, and revealed the correlation between the blue economy and the sustainable development of small islands. Wenshan Li, a researcher at the National Oceanic Information Center in China, stated that sea level rise is occurring more rapidly in small island countries. Coastal areas and islands face a greater challenge due to sea level rise at ground level and its effects will last for a long period of time [7]. The risk can be reduced by taking various measures to respond, but before implementing the response, consider its cost effectiveness.

The topics during this part of the forum were primarily on how to approach the issue of island SDGs under the impact of the COVID-19 pandemic from a variety of perspectives. The experts stated that in order to maintain the sustainable development of island countries (or sub-national regions) under the influence of COVID-19, it is necessary to focus on the practical responses of governments (tourism, energy, food security, reduction of inequalities and the like), local realities (sea level rise, etc.), and to strengthen regional cooperation based on the Blue Pacific to develop the blue economy.

3. Multiple developments in the field of ecological protection and restoration on islands

Associate professor Huan Zhang of Zhejiang University, China, examined the Zhoushan Islands as a representative complex archipelago system in China and constructed a set of ecological construction methods on three (macro, medium, and micro) levels in order to increase the carrying capacity of island human settlements and industrial development [8]. Professor Yanlai Zhang from Xiamen University analyzed Pingtian Islands, the international tourism islands, in relation to the settlement process in the information age, which is facing challenges associated with land use, tourism development, and cultural heritage. Throughout this development process, there are many challenges and opportunities, including the question of contemporary construction, i.e., we need to abandon the old mode of construction and adopt new ones. The solution to these issues must be interdisciplinary, integrating geography, climatology, urban planning, architecture and other disciplines. As a result, we will be able to preserve and continue the traditional regional style within the overall environment, create the contemporary expression of architectural styles and settlement spaces using contemporary technology and materials, and promote the sustainable development of islands [9]. Dr. Takuia Uakeia from the University of the South Pacific (Kiribati Campus) shared Kiribati’s traditional knowledge based on sustainable living practices. In his remarks, He noted that Kiribati’s Island environment, which is believed to have unique traditional knowledge, allows them to survive in such harsh, resource-limited environments. The development of island-specific traditional knowledge is a sustainable approach to the management of land and marine resources and provides solutions to emerging issues such as climate change and the depletion of natural resources. Associate professor Yi Hou from the Chinese Academy of Social Sciences, presented his research achievements on ‘The protection, inheritance, development and utilization of traditional culture in China’s islands.’ Under the severe impact of COVID-19, he believes that we should promote digital tourism by utilizing digital technology, create an island culture protection alliance, enhance the development of island culture, and add the cultural aspects of island tourism, and develop a model for island tourism development that is more efficient and inclusive, more resilient, as well as more sustainable.

Linting Zhang, the engineer of IRC, provided an explanation of China’s progress in island ecological restoration. She divided the overall process of island ecological restoration in China into six stages: (1) field investigation, (2) problem diagnosis, (3) objective determination, (4) scheme design, (5) practice and construction, and (6) monitoring and performance evaluation. Using the examples of the Pingtian & Xiamen islands, the effects and evaluation criteria of island ecological restoration were analyzed based on different ecological requirements. Xinhe Wei, Deputy Director of the Liaoning Province Ecological Protection Tourism Management Center, introduced more than ten marine ecological restoration projects in 2020 in Liaoning Province, and specifically discussed the Daling estuary in Jinzhou City (island ecosystem within the area). It is believed that the ‘Jinzhou model’ was formed by effectively combining the restoration of marine ecology with the development of marine economics and society. Dr. Zhiwei Zhang of the First Institute of Oceanography, MNR presented ‘An issue-oriented framework for marine spatial planning–A case study of Koh Lan, Thailand.’ As an illustration of the difficulties in implementing marine spatial planning, taking the practice of Koh Lan as an example, it is believed that a problem-oriented framework of marine spatial planning would contribute to achieving the goals of M decade 2030 and the United Nations Decade of Ocean Science for Sustainable Development (2021–2030). The IRC released the ‘Evaluation Report of Sea Island Development Index (2016–2020)’ and the ‘Evaluation Report of Sea Island Ecological Index (2016–2020)’ completed by Researcher Feng Aiping and his team [10]. The reports concluded that, while the development of some inhabited islands in China shows an overall trend of improvement, those islands traditionally dominated by agriculture, fishery, and tourism will be significantly affected by the epidemic in 2020. Meanwhile, the vegetation coverage rates, the water quality compliance rates, and the planning and implementation rates are largely unchanged from their original levels. The natural shoreline preservation rates and sewage treatment rates show an upward trend and then a downward trend, with most islands scoring highly in waste treatment. In contrast, scores for ecological protection and restoration projects had been declining over time, suggesting a need for more attention in the future.

The thematic focus of this conference is based on the natural island ecological restoration and practice. Scholarly ideas concerning island human settlement construction, island ecological restoration procedures, and island spatial planning are all based on natural solutions for island sustainability. In reality, ecological protection and restoration of islands need to take into account multiple factors, including the carrying capacity of the human settlement environment and the protection of natural resources on islands. Several countries have achieved substantial achievements and made significant contributions to the protection and
restoration of island ecosystems, providing experience for other island countries (regions) to implement nature-based island conservation and restoration activities.

4. New trends in island regional cooperation and scientific and technological progress

Associate professor Jiarui Liang of Liaocheng University discussed ‘A study on the mechanism of blue carbon economy cooperation between China and the Pacific island countries,’ suggesting that if China wishes to participate effectively in global ocean governance, blue carbon economic cooperation may be an effective entry point for strengthening cooperation with the Pacific island countries [11]. Wanchao Kang of the National Marine Technology Center in China, and his collaborators presented ‘Progress in coastal zone and marine space planning cooperation in Antigua.’ Currently, the National Marine Technology Center collaborates with the China Ocean Development Foundation and the Ministry of Social Transformation, Human Resource Development and the Blue Economy in Antigua and Barbuda on marine spatial planning and the development of blue economy. Antigua’s coastal zone and marine spatial planning is based on the SDGs and incorporates both the development and protection of the island to promote the sustainable development. According to Dr. Junnan Feng from the Chinese Academy of Social Sciences, climate change has caused serious impacts on the Pacific island region. She analyzed Japan’s aid to the Pacific island countries from 2014 to 2021, especially focusing on the history of this aid and the latest progress of meteorological services on 10 islands. She stated that this aid could result in an increase in the number of meteorological personnel, and enhance the capability of local weather observation and prediction. Yang Zhang at Xiamen University and his co-authors reported “A dual-scale assessment framework of small islands based on the ‘PSR AHP’ method” [12], arguing that using only ecological evaluation or resources in a single evaluation system makes it very difficult to know how to understand and solve the contradiction between ecological protection and resource utilization. By implementing the method of ‘PSR + AHP’ and developing an evaluation framework, a novel and practical double scale has been applied in Xiamen Xiaodeng Island. Their conclusion is that it can reduce errors in the related strategic planning. Similarly, a study from Fujian Agriculture and Forestry University in China identified several factors that affected the composition and spatial characteristics of plants on a large-scale island mountain in Fujian Province. As shown in the study, the composition of plants on large-scale island mountains is not influenced only by area, but also by altitude and edge effects. Dr Yin Zhang from the Institute of Desalination and Comprehensive Utilization of Tianjin, MNR, outlined the progress in desalinating seawater by reverse osmosis (RO), one of the most promising methods of providing fresh water supply to the China’s island regions, and suggested that it could be replicated in other island regions.

This part describes the current state and the future development direction of island international integration. The scholars discussed the cooperation in the fields of island spatial planning, island environmental governance, and island science & technology. From scientists’ experience in these three areas of cooperation, we can conclude that such cooperation is urgently needed and has a significant impact on the sustainable development of islands. Every country can take advantage of this experience and apply it to their own situation.

5. New directions in the modernization of island policy and governance

Dr. Fang Ye from Zhejiang Ocean University in China, introduced the latest findings in their research on the three-dimensional management and ownership confirmation of island resources in China with his co-authors, pointing out that the three-dimensional management framework of island resources has been basically established since the Law of the People’s Republic of China on the Protection of Offshore Islands became effective in 2010 [13]. MNR was established in 2018, necessitating the reconstruction of the three-dimensional management framework for island resources. The issue of three-dimensional confirmation of uninhabited islands rights is addressed with the objective of improving the property rights system and promoting the efficient utilization of limited island resources. Yuncheng Deng, Research Fellow of the IRC, discussed how to achieve ecological spatial justice in island governance. For China, ecological spatial justice manifests largely in the construction of island management systems that emphasize the priority of island protection [14,15]. Under the circumstances of unified natural resource management in China, the realization of island spatial justice has taken on some new characteristics and presented new development trends. The research of Rui He from Fujian Agriculture and Forestry University in China entitled, ‘A comparison of coastal tourism development and protection between China and Ghana.’ By using Pingtan Islands National Forest Park in China and Dodi Island Park in Ghana as the areas for analysis, the visualization analysis technology of SPSS was utilized to compare the coastal tourism resources, facilities and equipment, development characteristics, and related protection policies of the two regions, and optimization suggestions were provided. Ming Ming Su, an associate professor at Renmin University of China, had published a story titled “Tourism place making through the bioluminescent ‘Blue Tears’ of Pingtan Islands, China.” According to her, it is necessary to build an interactive system among the local government, tourists, and tourism enterprises in order to make Pingtan into a sustainable tourism destination. Tourism place-making theory and its practical implications for Pingtan and other island destinations merit further investigation [16–18].

Management of natural resources efficiently is the new direction in the modernization of island governance. Scholars discussed issues such as three-dimensional rights determination in relation to island resources, spatial justice associated with island ecology, development of an interactive island tourism system, and establishment of an island-type forest park. Aside from offering suggestions for sustainable development of islands, these guidelines also provided points of reference for small island countries and regions.

6. Conclusions

During the International Forum on Island Ecological Protection 2021, participants discussed new ideas, topics and plans for global island ecological protection and sustainable development, nature-based island ecological restoration and practice, island regional cooperation, scientific and technological advancement, and modernization of island policy and governance. Because island issues encompass a wide range of subjects, the forum provides a useful platform for international academic exchanges. The goal of the forum is to encourage more island scholars and practitioners to participate, support the modernization of island scientific research and island governance, and build a global island community with a shared future [19].

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Conflict of Interest

The authors declare that they have no conflict of interest.

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