

International Ocean Information

# 國際海洋資訊

雙月刊 | Bimonthly

23 April 2023

## 2022年「太平洋藍碳高峰會」 對臺灣參與碳匯交易的啓示

Enlightenment of the 2022 "Pacific Blue Carbon Summit" on  
Taiwan's Participation in Carbon-Sink Transactions

太平洋島國海洋資訊

Pacific Islands Ocean Information



海洋委員會  
Ocean Affairs Council

發行



International Ocean Information

# 國際海洋資訊

雙月刊 | Bimonthly 23 April 2023

## 目錄 Contents

- 發行人語** 1 我們的海洋 創造太平洋海域的藍色經濟
- 專題報導** 2 2022年「太平洋藍碳高峰會」對臺灣參與碳匯交易的啓示
- 國際議題** 7 太平洋地區海洋垃圾行動計畫（2018-2025）：  
以循環經濟為本的廢棄物管理策略
- 組織焦點** 12 太平洋島國論壇簡介
- 組織焦點** 17 太平洋共同體簡介
- 資訊新知** 21 太平洋海岸工程環境影響評估（EIA）實踐指南介紹
- 法規制度** 26 太平洋島嶼地區的海洋治理經驗分享
- 
- Letter of Publisher** 31 Our Ocean - Creating a Blue Economy in the Pacific Region
- Special Report** 32 Enlightenment of the 2022 "Pacific Blue Carbon Summit" on  
Taiwan's Participation in Carbon-Sink Transactions
- International Issues** 37 Pacific Regional Action Plan: Marine Litter 2018-2025:  
a Waste Management Strategy Based on the Circular Economy
- Organization Focus** 42 Introduction to Pacific Islands Forum (PIF)
- Organization Focus** 47 Introduction to Pacific Community (SPC)
- Latest News** 51 Introduction to the Good Practice Guidelines In Environmental Impact  
Assessment (EIA) for Coastal Engineering In The Pacific
- Regulatory Systems** 56 Ocean Governance in The Pacific Islands Area: Some Lessons



## Our Ocean Creating a Blue Economy in the Pacific Region

Minister of the Ocean Affairs Council: Bi-Ling Kuan  
Translated by Linguitronics

For this edition of International Ocean Information, the "Special Report" will be featuring an article that shares details on the "Pacific Blue Carbon Summit" held at National Sun Yat-sen University on December 9, 2022, particularly the views on the development trends of blue carbon issues representatives and ambassadors to Taiwan from six countries including Palau, Haiti, Nauru, Tuvalu, Eswatini and Papua New Guinea shared and exchanged during the sessions. Deep-sea blue carbon, carbon fixation in the deep-sea can be stored for hundreds of years, which helps alleviate climate change. Many Pacific countries have proposed discussions on blue carbon trading to the United Nations (UN). According to Taiwan 2050 net-zero emission policy, Ocean Affairs Council is going to focus on the promotions of marine energy development, marine waste recycling, and marine carbon-sink transactions investigation and conservation. Taiwan expects to play the role of ocean carbon reduction and ocean carbon fixation, and to establish interactive and cooperative relations with Pacific Island countries, while further preparing for and responding to future carbon credit trading.

As Taiwan is located on the west coast of the Pacific Ocean, in addition to maintaining amicable relations with Pacific Island countries, our nation also pays close attention to ocean-related international trends so as to continue reinforcing exchanges, cooperation, and developments on sustainable ocean issues between Taiwan and countries within this region. Thus, in this issue we will be focusing on relevant organizations and marine issues in the Pacific Island countries. The Pacific Islands Forum (PIF), formerly known as the South Pacific Forum established in 1971, is an important regional organization in the South Pacific. PIF is committed to promoting regional economic cooperation and integration, and has over the years achieved major milestones including the "South Pacific Regional Trade and Economic Co-operation Agreement (SPARTECA)" signed in 1980 and the "South Pacific Nuclear Free Zone Treaty" passed in 1986. Apart from the PIF, The Pacific Community is also one of the major pioneering regional organizations established to promote regional integration and development. Formerly known as the South Pacific Commission formulated in 1947, The Pacific Community's mission is to assist the management of regional territories and to offer consulting and recommendations, thus promoting economic development in the South Pacific region.

Furthermore, "International Issues" introduces the Pacific Regional Action Plan: Marine Litter 2018-2025 forged by the Secretariat of the Pacific Regional Environment Program (SPREP). By taking stock of the various sources of garbage in the Pacific Island countries and regional territories, we are able to focus on understanding the main regional documents and management measures formulated by the Pacific Island countries and territories to solve the issue of marine debris. Meanwhile, the "Latest News" section sheds light on the SPREP's Good Practice Guidelines in Environmental Impact Assessment for Coastal Engineering in the Pacific, which discusses environmental assessment and governance along the Pacific coast including coastal systems and engineering projects, ports and waterways, land reclamation, breakwaters, beach maintenance, aquaculture, wastewater discharge and other related issues. Lastly, "Regulatory Systems" introduces the marine policies and overall strategic framework for action of the Pacific Islands region, including explaining the relevant regional marine agreements, plans, and policies for improving coastal and ocean governance, enhancing understanding of marine knowledge, developing sustainable management of marine resources use, as well as building regional partnerships and fostering international cooperation.



## Enlightenment of the 2022 "Pacific Blue Carbon Summit" on Taiwan's Participation in Carbon-Sink Transactions

Vicente G. Abedneko (Ph.D. student, Department of Oceanography, National Sun Yat-sen University)

Tsang-Yuh Lin (Doctoral Candidate, Institute of Ocean Technology and Marine Affairs, National Cheng Kung University)

Chin-Chang Hung (Distinguished Professor and Dean, Department of Oceanography, National Sun Yat-sen University)

Translated by Chung Hua Translation Service

Keywords: Blue Carbon, Pacific Blue Carbon Summit, Carbon Sinks, Carbon Rights, Island Countries

With the support of the Ministry of Foreign Affairs, National Sun Yat-sen University hosted the first Pacific Blue Carbon Summit on Dec. 9, 2022, and H.E. Ambassador David Adams Orrukem was invited to give a speech. At the same time, it also attracted ambassadors and representatives from six countries, including of the Republic of Palau, Republic of Haiti, Republic of Nauru, Tuvalu, Kingdom of Eswatini, and Independent State of Papua New Guinea, to participate in the event (Figure 1). It advocated the development of blue carbon and closely discussed various aspects of the "deep sea blue carbon sink trading strategy," such as its measurement methods, technology applications, and evaluation of carbon sink trading.



Figure 1/ Group photo at the summit: From the left in the front row, Papua New Guinea Trade Office in Taiwan Representative Mr. Tommy Kambu Kunji, Ambassador of the Republic of Haiti Roudy Stanley Penn and his wife Madam Penn, Vice President Zhiwen Guo of National Sun Yat-sen University, Ambassador of the Republic of Palau David Adams Orrukem, Ambassador of Tuvalu Bikenibeu Paeniu, Ambassador of the Republic of Nauru Jarden Kephass and First Secretary of the Kingdom of Eswatini Abbigail Pietrese

Image by National Sun Yat-sen University

### Progress of the Pacific Blue Carbon Summit

Scholars and experts at the summit mentioned: Since deep sea blue carbon could store carbon dioxide for hundreds of years, it would help alleviate climate change. The international community is promoting scientific analysis methods and international standards to calculate blue carbon sinks in the deep sea for future assessment and carbon credit auditing. For the future development of blue carbon in the Pacific region, measuring and calculating the carbon sink potential of the exclusive economic zone of the island countries and using scientific methods to assess the deep-sea blue carbon sink of each country is the first step to grasping the ocean blue carbon sinks of the island countries. Although deep-sea blue carbon is still in the pricing stage, many Pacific countries are presenting discussions on blue carbon trading to the United Nations. Related issues involve global inclusion, carbon right, and carbon credit negotiation.



Ambassadors, representatives, and participants from various countries also agreed on the importance of carbon sinks in the exclusive economic zone of island countries. According to Articles 55, 56, and 57 of the "United Nations Convention on the Law of the Sea, UNCLOS," the exclusive economic zone is an area beyond and adjacent to the territorial sea; the exclusive economic zone shall not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured. The coastal State in the exclusive economic zone has rights to marine scientific research and own sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil, and with regard to other activities for the economic exploitation and exploration of the zone [1]. The empowerment of this agreement will enable island countries to become carbon-credit suppliers in the global blue carbon market, gain benefits and income from blue carbon sink transactions, and have the opportunity to realize economic and industrial transformation at the national level. Therefore, all the representatives at the meeting hope that in the near future, deep-sea carbon storage can be used as carbon credits to offset the carbon emissions of oceanic countries and even conduct carbon trading with major carbon dioxide-emitting countries.

### Why Promote Blue Carbon

Why did the summit focus on promoting blue carbon instead of the more well-known green carbon? By definition, the so-called green carbon is the carbon stored in plants and soils in natural ecosystems (such as forests) on land, which is a crucial component of the global carbon cycle. However, what is less known is that the oceanic carbon pool has a large carbon storage capacity [2][3] (Figure 2). The deep-sea blue carbon is the most important part of the ocean carbon pool. Nevertheless, for countries with a small area, such as the Pacific island countries and Taiwan, the development potential of green carbon will be limited by the land area, so discovering blue carbon sinks is a good strategy.

Blue carbon, by definition, refers to organic carbon captured and stored by oceanic and coastal ecosystems. In recent years, research has mainly focused on algae, seagrasses, macroalgae, mangroves, salt marshes, and coastal wetlands in coastal wetlands. Because of the high carbon storage characteristics of blue carbon ecosystems, in addition to providing long-term carbon storage, it is also a potential tool for managing greenhouse gas emissions and other adaptive policies. At present, in identifying blue carbon attributes, in addition to the known part of the coastal blue carbon ecosystem, different types of marine ecosystems like macroalgae and phytoplankton exist. Due to insufficient data or scientific disputes about its carbon stocks, greenhouse gas flux, or carbon flux into the sea, its application potential is still limited by the current carbon sequestration management, technology, or calculation methods. It can be identified as a blue carbon ecosystem after the relevant issues are addressed [4][5][6].

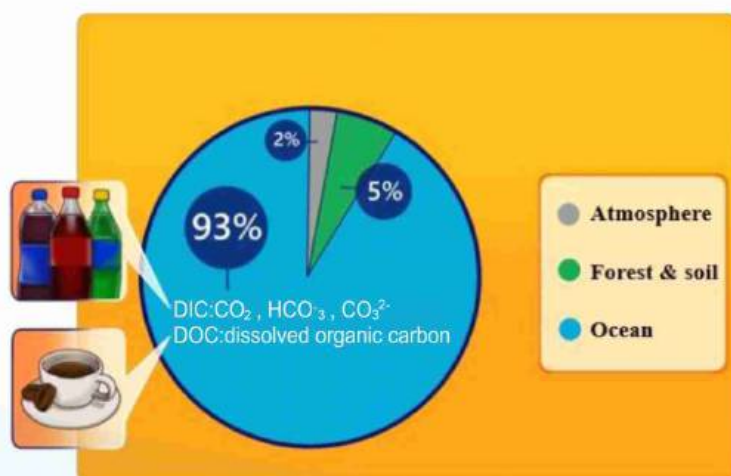


Figure 2/ Schematic diagram of the carbon content of the three major active carbon pools. Ocean (38000 Gt, 93%), atmosphere (750 Gt, 2%), and soil and forest (2050 Gt, 5%); 1 Gt =  $10^9$  ton-C; dissolved inorganic carbon (DIC) in the ocean is similar to Carbon dioxide dissolved in soda water; dissolved organic carbon (DOC) is similar to dissolved coffee extract in coffee liquid

Image drawn by the author



### Advantages of Blue Carbon Storage or Burial in Deep-Sea

Generally, deep ocean carbon sequestration is more than the coastal areas; Open oceans can have large amounts of space, letting phytoplankton, zooplankton, microzooplankton, and other photosynthesizing organisms that take up and remove carbon from the atmosphere and sink/store them in the deep ocean and sediments. In contrast, when coastal habitats are degraded or converted to other land uses, vegetated coastal ecosystems (such as swamps, mangroves, seagrasses, etc.) may lose their high carbon sequestration characteristics. Extreme weather events will also affect the ecosystems of these coastal zones because the soil and sediments will be exposed to the atmosphere due to weather disturbances, releasing greenhouse gases back into the atmosphere and blue carbon sink capacity is lost or adversely affected [7].

In addition, several Carbon Dioxide Removal (CDR) strategies have been proposed to provide negative CO<sub>2</sub> emissions on a global scale, including ocean-based CDR strategies. Ocean CDR strategies include fertilizing the ocean (such as adding iron) to cultivate microplankton or macrophytes to enhance the efficiency of biological pumps in the ocean and inject them into the deep sea or seabed to store carbon. Due to the vast ocean size and seawater's buffering capacity, large amounts of carbon dioxide are stored in the ocean or buried in marine sediments. The social cost of many marine CDR strategies is lower than that of land-based CDR strategies, which also means that ocean-based CDR strategies are easier to promote.

In fact, any ocean-based CDR strategy that increases the productivity of the upper ocean and transports carbon to the deep ocean will have a short-term impact on the concentration of carbon dioxide in the atmosphere [8][9][10]. The strategy of importing or storing carbon in the water column can benefit from the exchange phenomenon between the ocean surface and deep water mass produced by ocean circulation and its mixing process so that carbon can be stored in the deep sea for a long time [8][9][11][12]. This physical process shows that deeper depths have better storage benefits. According to recent studies, carbon storage may not be efficient at discharge depths less than 500 meters, as the typical storage time at these depths is much less than 100 years, meaning if one wants to implement a CDR strategy for long-term storage (i.e., storage time > 100 years), the feasible discharge depth needs to be greater than 500 meters [8].

### What can we do with Pacific Countries?

At present, Taiwan has modern technology, equipment, and advanced research vessels in marine surveys. Taiwan also has established a complete on-site survey capability and published articles on oceanic carbon sinks in the world [13][14][15][16]. Therefore, we can assist and guide the Pacific island countries to carry out carbon sink surveys in their territorial waters and exclusive economic zones to establish more interactions and cooperation and make further preparations for promoting carbon trading.

In practice, because carbon credits need to be supported by scientific evidence to support their origin and certified by government licensing agencies, we should currently focus on investigating blue carbon sinks in coastal zones and oceans (Figure 3). Accordingly, the core goal of Taiwan's cooperation with Pacific island countries in marine surveys should be to collect and use scientific data to prove the amount of carbon sinks stored in exclusive economic zones. It sets up relevant countries' background carbon sink baseline in the exclusive economic zone. Furthermore, new blue carbon sinks in their coastal zones and oceans can be certified by establishing the certification system of individual countries or regions. The establishment of such scientific data and legal systems will allow Taiwan and related Pacific countries to better prepare for carbon sink trading on a global scale.



In addition, based on previous research results, Taiwan currently has preliminary data on carbon flux and carbon sinks in the surrounding sea areas, which can be used to calculate and estimate the carbon sink potential of the surrounding sea areas. In the future, by cooperating with Palau and other countries or regions to investigate blue carbon opportunities, we can further explore adjacent sea areas and increase my country's marine database reserves. For cooperation with the Pacific island countries, Taiwan can be expected to act as a leader in scientific research and conduct in-depth exchanges and communication with relevant countries to build a bilateral or multilateral carbon sink trading mechanism, which provides Taiwan with carbon trading options for future reserves.

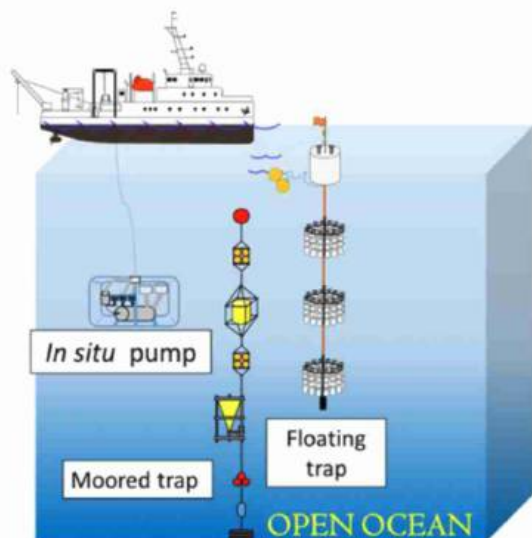


Figure 3/ Schematic diagram of offshore blue carbon sink investigation. Samples are collected using moored traps, floating traps and in-situ pumps to measure oceanic blue carbon sinks  
Image drawn by the author

### Seaweed Farming and Blue Carbon Credits

Since the ocean-based CDR strategy includes establishing marine diversity and healthy ecosystems (including macroalgae, seaweed beds, coral reefs, and rich marine food webs) in the sea, Sun Yat-sen University tried to develop macroalgae in pure seawater for four seasons, through which seaweed can absorb excess nutrients and store carbon [17]. At present, there are two ways to cultivate seaweed, one is in the ocean, and the other is in shore-based culture ponds. Seaweed farming can be carried out in most coastal areas, and seaweed farming in culture ponds can be combined with general aquaculture. The seaweed produced by these two methods can be stored in the deep sea by natural sedimentation and stored as a carbon sink. This technology can increase carbon sinks, which is believed to help promote the international community's carbon rights and carbon offset trading markets.

Taiwan has used culture ponds or cage nets with macroalgae cultivation to improve the marine food web. Turning these existing farms into potential seaweed carbon sink supply sources and shared ecological platforms will be a win-win approach. This technology is suitable for use in Taiwan and other Pacific island countries. Taking Taiwan's southwestern and eastern waters as an example, the water depth is over 500 or even 2,000 meters at dozens of nautical miles offshore. After carbon sequestration along the coast, these large seaweeds can be eaten by various fish or shellfish, increasing marine biodiversity. The excess seaweed can also be transported to the deep sea area for sea dumping and stored in the deep sea or ocean bottom for over a hundred years.

Therefore, besides assisting the friendly nations in investigating the baseline value of blue carbon in the deep sea, we also need to find the local macroalgae suitable for the Pacific Ocean. Promote this "sound marine ecosystem and low maintenance cost" method to help countries with diplomatic relations develop a healthy blue economy, increase fiscal revenue, and make both parties participants in carbon sink transactions and suppliers of blue carbon credits.



## Epilogue

Countries around the world are actively looking for ways to net zero carbon emissions, and relevant communities worldwide are also discussing the future of ocean blue carbon, thinking about its role and application in mitigating the impact of climate change. The Pacific Ocean is the largest active carbon pool in the ocean. These island countries should immediately investigate the carbon sink baseline in their oceans and try to create [additional] blue carbon sinks. For Taiwan, at this stage, in addition to training our allies to participate in measuring blue carbon sinks in the sea, we also need to assist them in developing potential large algae seas and sound marine ecosystems to reduce carbon.

Allies in Taiwan and the Pacific Ocean are limited by land area, so they need to shift their attention from green carbon to blue carbon, actively study the formation mechanism of ocean blue carbon sinks, and innovate methods for blue carbon sequestration. Although Taiwan is not a member of the United Nations, it can enter into the proposals of the United Nations through friendly countries so that deep-sea blue carbon can be used as a carbon swap or trading target just like forest green carbon.

Taiwan has excellent blue carbon sink measurement technology and capabilities, and our Pacific allies urgently need our assistance and guidance. Therefore, as a leader in the study of blue carbon sinks in the Pacific region, Taiwan should cooperate closely with Pacific allies so that the allied countries can hope to join forces to participate in global carbon sink trading. As for the way of organization, in addition to the conventional economic, trade, and diplomatic means, it may be as suggested by the President of Palau, Surangel S. Whipps: Companies are established through joint funding (technology or capital) between countries to strengthen or replace inter-governmental cooperation to make carbon sink transactions between countries more flexible.

## References

- [1] The United Nations Convention on the Law of the Sea (UNCLOS). Article 55, 56 & 57.  
[https://www.un.org/depts/los/convention\\_agreements/texts/unclos/part5.htm](https://www.un.org/depts/los/convention_agreements/texts/unclos/part5.htm) (Feb. 10, 2023)
- [2] Mackey, B., Keith, H., Berry, S. L., and Lindenmayer, D. B. (2008). Green carbon: the role of natural forests in carbon storage (ANU E Press), 47.
- [3] Ontli, T. A., and Schulte, L. A. (2012). "Soil carbon storage." *Nature Education Knowledge*, 3(10): 35.
- [4] Wylie, L., Sutton-Grier, A. E., and Moore, A. (2016). "Keys to successful blue carbon projects: lessons learned from global case studies." *Marine Policy*, 65: 76-84.
- [5] Lovelock, C. E., and Duarte, C. M. (2019). "Dimensions of blue carbon and emerging perspectives." *Biology letters*, 15(3): 20180781.
- [6] P. I. Macreadie, A. Anton, J. A. Raven, N. Beaumont, R. M. Connolly, D. A. Friess, J. J. Kelleway, H. Kennedy, T. Kuwae, P. S. Lavery, C. E. Lovelock, D. A. Smale, E. T. Apostolaki, T. B. Atwood, J. Baldock, T. S. Bianchi, G. L. Chmura, B. D. Eyre, J. W. Fourqurean, J. M. Hall-Spencer, M. Huxham, I. E. Hendriks, D. Krause-Jensen, D. Laffoley, T. Luisetti, N. Marbà, P. Masque, K. J. McGlathery, J. P. Magonigal, D. Murdiyarso, B. D. Russell, R. Santos, O. Serrano, B. R. Silliman, K. Watanabe, and C. M. Duarte (2019). "The future of Blue Carbon science." *Nature communications*, 10(1): 3998.
- [7] L. Pendleton, D. C. Donato, B. C. Murray, S. Crooks, W. A. Jenkins, S. Siffleet, C. Craft, J. W. Fourqurean, J. B. Kauffman, N. Marbà, P. Magonigal, E. Pidgeon, D. Herr, D. Gordon, and A. Baldera (2012). "Estimating global 'blue carbon' emissions from conversion and degradation of vegetated coastal ecosystems." *PLoS ONE*, 7(9): e43542.
- [8] Siegel, D. A., DeVries, T., Doney, S. C., and Bell, T. (2021). "Assessing the sequestration time scales of some ocean-based carbon dioxide reduction strategies." *Environmental Research Letters*, 16(10): 104003.
- [9] Aumont, O., and Bopp, L. (2006). "Globalizing results from ocean in situ iron fertilization studies." *Global Biogeochemical Cycles*, 20(2).
- [10] Hauck, J., Köhler, P., Wolf-Gladrow, D., and Völker, C. (2016). "Iron fertilization and century-scale effects of open ocean dissolution of olivine in a simulated CO<sub>2</sub> removal experiment." *Environmental Research Letters*, 11(2): 024007.
- [11] J. Orr, O. Aumont, A. Yool, K. Plattner, F. Joos, E. Maier-Reimer, Marie-France Weirig, R. Schlitzer, K. Caldeira, M. Wickett, and R. Matear (2001). "Ocean CO<sub>2</sub> sequestration efficiency from 3-D ocean model comparison." In *Greenhouse Gas Control Technologies* (CSIRO, edited by D. Williams, B. Durie, P. McMullan, C. Paulson, and A. Smith), 469-474.
- [12] Herzog, H., Caldeira, K., and Reilly, J. (2003). "An issue of permanence: Assessing the effectiveness of temporary carbon storage." *Climatic Change*, 59: 293-310.
- [13] C.-C. Hung, G.-C. Gong, W.-C. Chou, C. -C. Chung, M.-A. Lee, Y. Chang, H.-Y. Chen, S.-J. Huang, Y. Yang, W.-R. Yang, W.-C. Chung, S.-L. Li, and E. Laws (2010). "The effect of typhoon on particulate organic carbon flux in the southern East China Sea." *Biogeosciences*, 7: 3007-3018.
- [14] C.-C. Hung, C.-W. Tseng, G.-C. Gong, K.-S. Chen, M.-H. Chen, and S.-C. Hsu (2013). "Fluxes of particulate organic carbon in the East China Sea in summer." *Biogeosciences*, 10: 6469-6484.
- [15] Y.-Y. Shih, C.-C. Hung, G.-C. Gong, W.-C. Chung, Y.-H. Wang, I.-H. Lee, K.-S. Chen, and C.-Y. Ho (2015). "Enhanced particulate organic carbon export at eddy edges in the oligotrophic western North Pacific Ocean." *Plos One*, 10: e0131538.  
<https://doi.org/10.1371/journal.pone.0131538>
- [16] Y.-Y. Shih, C.-C. Hung, S.-Y. Huang, F. L. L. Muller, and Y.-H. Chen (2020). "Biogeochemical variability of the upper ocean response to typhoons and storms in the northern South China Sea." *Frontiers in Marine Science*, 7:151.  
<https://doi.org/10.3389/fmars.2020.00151>
- [17] W. S. Weerakkody, K. H. Ling, H.-H. Hsieh, V. G. Abedneko, J.-F. Shyu, T.-M. Lee, Y.-Y. Shih, R.R.M.K.P. Ranatunga, P. H. Santschi, and C.-C. Hung (2023). "Carbon capture by macroalgae *Sarcodia suae* using aquaculture wastewater and solar energy for cooling in subtropical regions." *Science of the Total Environment*, 855: 158850.  
<https://doi.org/10.1016/j.scitotenv.2022.158850>



# Pacific Regional Action Plan: Marine Litter 2018-2025: a Waste Management Strategy Based on the Circular Economy

Chung-Ling Chen (Professor, Institute of Ocean Technology and Marine Affairs, National Cheng Kung University)

Chien-Ho Liu (PhD, Institute of Ocean Technology and Marine Affairs, National Cheng Kung University)

Keywords: marine litter, waste management, circular economy, SPREP

Marine litter is one of environmental problems faced by the Pacific island countries and territories. To address this problem, the Secretariat of the Pacific Regional Environment Programme (SPREP) developed the "Pacific Regional Action Plan: Marine Litter 2018-2025". This action plan is a major document to solve marine litter problems across the Pacific island countries and territories. It is dedicated to waste management working toward a circular economy. To this end, the 5 "Rs"- Refuse, Reduce, Reuse, Recycle and Return - should be implemented and waste minimization would finally achieved. Among the 5 "Rs", the 'Return' is a strategy developed due to the practical considerations that most island countries and territories do not have economic or technological capability to establish environmentally sound recycling facilities. This action plan surveys various sources of marine litter in the Pacific island countries and territories and for each source the management measures are devised accordingly. Funding for the implementation of this plan mostly come from international investment projects (The content of this essay is mostly excerpted and compiled from [1]).

## Introduction

The Pacific is the world's largest ocean, covering about one third of the Earth's surface. About 30,000 islands of various shape and size lie across this vast expanse. Among them, about 500 islands are inhabited with a total population of about 10 million. The people of the Pacific region have relied on rich natural resources in the marine environment for their survival. They depend on the marine environment for food, transport, tourism, traditional practices, and economic opportunities. Therefore, it is essential to maintain a healthy marine environment. For this, Pacific island countries and territories are striving to achieve a balance between the maintenance of healthy oceans and the needs of economic developments. However, currently marine environments face a myriad of threats from proposed deep-sea mining in the International Seabed Authority, coastal development, eutrophication, invasive species, overfishing, destructive fishing, marine noise pollution, ocean acidification, sea level rise, storms, and marine litter [2].

Among these threats, marine litter is a serious issue with every beach in all 30,000 islands more or less being littered with the rubbish of humans. It brings about negative ecological, economic and social impacts. Statistics show that 4.7 to 5 million tons of materials are imported to the Pacific island countries and territories per annum, dominated by motor vehicles, oil, paper/cardboard and PET containers. Only about 1 million tones return to source, being predominantly used motor/cooking oils, PET containers and scrap metal. These figures are indicative of the problem – the Pacific island countries and territories accumulating substantial volumes of waste annually. In particular, the Pacific countries and territories face various sources of solid waste such as accidental and deliberate discharge



into the sea of garbage generated during normal vessel operations, take-away food and beverage containers, packaging and disposable healthcare products (e.g., nappies, toothbrushes, shavers), fishing nets and gear discarded or lost in the sea during fishing operations, food and beverage containers discarded by passengers on deck in cruise ships, waste thrown away by beach tourists, etc. Such solid waste is highly likely to end up within island estuaries, lagoons, coastal waters and the Pacific Ocean.

To address marine litter in the Pacific region, the Secretariat of the Pacific Regional Environment Programme (SPREP), in consultation with all island members, developed the Pacific Regional Action Plan: Marine Litter 2018-2025 in a hope that island countries and territories collectively refuse buying something unnecessary or importing deleterious substances as well as ensure reuse, recycle, reduce, and return. It facilitates building a good practice of waste management based on the circular economy. SPREP is an intergovernmental organization in the Pacific region, which was established by Pacific Leaders on June 1993 and charged with supporting the work of members to address the region's environmental challenges. It is dedicated to marine environmental protection and sustainable development in the Pacific region, through providing technical advice, programme support, human and institutional capacity building and coordinating regional responses to global issues and international agreements. SPREP is a partnership of 26 members scattered over thousands of kilometers of ocean sharing common elements of culture, history and environment. The combined EEZs of the members covers 30 million square kilometers but the land area of this ocean realm only covers 2% of the huge area [2]. SPREP has close collaboration with the United Nations Environment Programme (UNEP) and is one of 18 Regional Seas Programmes [3].

### Pacific Regional Action Plan: Marine Litter 2018-2025

The Pacific Regional Action Plan: Marine Litter 2018-2025 consists of three parts: waste management, action plan, and funding.

#### I. Waste management

Waste management is based on the circular economy. Realizing a circular economy requires innovative business models, skills and services to enable the final return of organic materials back to nature, manufactured items back into the industrial production system and finally waste minimization. In other words, there is a need to build a consistent, comprehensive 5Rs waste management system across all Pacific island countries and territories. The 5 "Rs" refers to Refuse, Reduce, Reuse, Recycle and Return.

- **Refuse:** it refers to not buying something that is unnecessary or importing deleterious substances. For this, some island countries and territories made legislations to ban import of certain substances such as asbestos, non medical use radioactive materials and/or impose restrictions on the use of certain products such as plastic microbeads, single use plastic bags, Styrofoam and disposable cups and plates, products with non-biodegradable packaging.
- **Reduce:** it refers to waste reduction. A key part of it is conservation. The ways of waste reduction include using natural resources wisely, and using less resources than usual in order to avoid waste; reusing materials instead of throwing them away, pass those materials on to others who could use them too.
- **Reuse:** it refers to the action or practice of using something again, whether for its original purpose or to fulfill a different function.



- **Recycle:** it refers to converting waste materials into new materials and objects.
- **Return:** it refers to the return of recyclable commodities to environmentally sound recycling facilities located overseas mainly in consideration and recognition of the fact that most Pacific island countries and territories do not have technical and economic capabilities to establish such recycling facilities.



Figure 1/ In Pacific island countries and territories, the "Return" strategy is applied to the waste of washing machines, refrigerators, air conditioners, etc. in which producers retrieve back the waste and dispose of it at their home countries

Image by Chung-Ling Chen

## II. Action plan

This action plan builds on existing policy and regulatory frameworks, including the United Nations Convention on the Law of the Sea; Annex V, International Convention for the Prevention of Pollution from Ships 1973, modified by the Protocol of 1978 (MARPOL); Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter 1972, updated by the Protocol 1996; Noumea Convention for the Pacific; etc. Based on different sources of waste, it lays out 10 measures to deal with each source of waste. In addition, awareness and action is also listed as one of measures. A total of 11 measures are then devised to tackle marine litter.

### i. Fishing vessel waste

Over the next 10 years, concerned authorities seize the time when fishing access licenses are renewed or new licenses are established and strengthen monitoring of fishing activities and enforce the 2017-04 Conservation Management Measure on Marine Pollution in order to reduce waste from fishing vessels.

### ii. Shipping vessel waste

Emphasis on MARPOL compliance through port state control.

### iii. Cruise ship waste

Emphasis on MARPOL compliance through port state control. In addition, concerned authorities seize the time when cruise company access licenses are renewed or established and reinforce their corporate social responsibility, which can then be used by the companies as part of their promotion and environmentally sound certification systems.



Figure 2/ Cruise ship waste is one of sources of marine litter in Pacific island countries and territories. Implementing port state control and reinforcing social corporate responsibility help reduce the waste of this source

Image by Chung-Ling Chen



#### iv. Transboundary waste

It is very difficult to precisely determine transboundary waste sources. The Centre for Environment, Fisheries, and Aquaculture Science, under the auspice of SPREP, therefore should assist in defining key transboundary waste sources and making necessary regulations and enforcement.

#### v. Take-away food and beverage containers

The ways that could deal with the waste of take-away food and beverage containers include: establishing container deposit schemes across all member states, using recyclable and biodegradable containers, reinvigorating prior customs for using hand-woven natural fibre to make containers, etc.

#### vi. Capital product waste

Since most island countries and territories do not have economic or technological capability to set up environmentally sound recycling facilities for capital products such as white goods (e.g., washing machines, refrigerators, air conditioners), vehicles and electronic consumer items. The "Return" strategy is therefore employed for this type of waste. This strategy requires the fulfillment of producer responsibility in a way that producers retrieve back the waste and dispose of it at their home countries.

#### vii. Awareness and action

Making use of diverse channels is very important in terms of enhancing awareness and action of communities toward marine litter. The channels are such as social media. The channels are such as social media (e.g., Youtube, Facebook), websites, schools, churches, various sports competitions (e.g., rugby, football, baseball, basketball), etc.

#### viii. Tourist resort waste

While there is already a high level of waste management in most tourist resorts, concerned authorities could seize the time when tourist resort access licenses are renewed or new developments approved and reinforce their corporate social responsibility, which can then be used by the companies as part of their promotion and environmentally sound certification systems.

#### ix. Disaster waste

Disaster waste refers to the waste that are transported to river, lagoon, estuary and ocean by high runoff events when typhoons and tsunamis strike, and the waste generated during disaster recovery such as plastic drinking water bottles. There are three major ways to reduce the waste from disasters: 1) work with Australia, New Zealand, France and the United States to develop and implement Standard Operating Procedures for waste management in disaster recovery periods; 2) build on the Procedures to formulate similar but locally relevant procedures for all Pacific island emergence services; 3) train staff to become waste management experts and establish liaison teams, serving as a key part of all disaster responses.

#### x. Water-borne litter

Establishing facilities to trap waste floating on water is a key way to catch water-borne litter. The areas are preferred for such establishment include major urban centres, areas that landfill sites are nearby, major waterways and rivers, major high use embayments and estuaries, sheltered locations where trash is likely to aggregate, etc.



### xi. Coastal litter

Sponsoring various activities is important in cleaning coastal litter. The activities are such as clean-up competitions between beaches and islands, eco-tourist tours to remote island to clean up the beaches, etc. In addition, developing a standardized marine litter data collection, and treating the trash collected from the coast are also important. The former assists in subsequent analysis of the source of trash and thus making proper measures to mitigate these sources. The latter involves the establishment of facilities to store the trash collected from the coast for subsequent trash sorting. It helps reduce the amount of trash that is ultimately transported to landfills. It is worth noting that coastal clean ups assist in enhancing community awareness toward marine litter and further initiating a behavioral change among participants.

## III. Funding

Funding for the implementation of the action plan mostly comes from international investment programs. There are currently many programs sponsoring the activities to deal with marine litter. For example, the Japanese Technical Project for promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries (JPRISM II) assists in terrestrial waste management (i.e., landfills and recycling). European Development Fund (EDF) helps address E-waste, asbestos, healthcare and medical waste, residual solid waste, disaster waste, etc. through improved collection and disposal, to reduce the waste of terrestrial sources. Agence Française de Développement (AFD) sponsors citizen science programs to facilitate better understanding of the marine plastics issues. Centre for Environment, Fisheries and Aquaculture Science conducts the survey of baseline information, including sources, nature and impact of pollution.

## Conclusion

Pacific island countries and territories are located remotely and the materials that support their life thus mostly rely on imports. However, the amount of materials imported is far greater than that returning back to the origin, leading to a serious issue of waste accumulation. This demonstrates that marine litter is one of environmental challenges that Pacific island countries and territories face. To tackle this challenge, SPREP developed the "Pacific Regional Action Plan: Marine Litter 2018-2025", serving as a major document to address marine litter problems.

This action plan builds on the concept of a circular economy and uses the 5 "Rs" approaches to waste management in order to ultimately reach waste minimization. This action plan has financial support from international programs with a vision of effectively reaching waste reduction by 2025.

## References

- [1] SPREP (2018). Pacific Marine Action Plan: Marine Litter 2018–2025 (Apia, Samoa: SPREP).
- [2] United Nations Environment Programme. Pacific.   
<https://reurl.cc/MR3VMm> (Feb. 17, 2023)
- [3] United Nations Environment Programme. Regional Seas Programme.   
<https://reurl.cc/lvzAnv> (Feb. 17, 2023)



## Introduction to Pacific Islands Forum (PIF)

Scott Tai-Yun Wen (Secretary, Overseas Fisheries Development Council of the Republic of China)

Keywords: Pacific Islands States, International Organization, Forum Fisheries Agency,

Regional Integration

The Pacific Islands Forum (PIF) is a key regional organization in the South Pacific region, which consists of 18 members: Australia, Cook Islands, the Federated States of Micronesia, Fiji, French Polynesia, Kiribati, Nauru, New Caledonia, New Zealand, Niue, Palau, Papua New Guinea, the Republic of Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu. PIF also has Tokelau as an associate member and American Samoa, Commonwealth of The Northern Marianas, Guam, Timor Leste, and Wallis and Futuna as observers.

### PIF Development: A Brief History

PIF is the successor of the South Pacific Forum, which was founded in 1971 by Australia, the Cook Islands, Fiji, Nauru, New Zealand, Tonga, and Samoa. The South Pacific Forum established the South Pacific Bureau for Economic Co-operation as its administrative body, which title was later changed to South Pacific Forum Secretariat in 1981. The formation of the South Pacific Forum was to provide a platform for political negotiation and communication along with collective decision-making, which responded to the essential need of the Pacific Island Countries (PICs) following the procurement of their independence after the end of World War II. The earlier-initiated regional organization South Pacific Commission (currently Pacific Community) was incapable to address such demands due to its focus on only scientific and technical issues [1]. Since its creation, the South Pacific Forum has contributed to the progress of political agenda, such as decolonization and the prohibition of nuclear weapons testing in the South Pacific region, and the promotion of regional economic cooperation and integration.

The South Pacific Forum's significant achievements include the 1980 South Pacific Regional Trade and Economic Co-operation Agreement, which allows multiple agricultural, fishery, and industrial products can be exported to Australian and New Zealand markets unrestrictedly without tariff, facilitating regional economic integration [2]. The Forum members also adopted the South Pacific Nuclear Free Zone Treaty in 1986, renouncing and preventing nuclear testing or the disposal of nuclear wastes in the area, and they successfully facilitated the signature of the subsequent protocols from China, France, Russia, the UK, and the US. The nuclear powers agreed not to undertake any test of nuclear explosive devices within the South Pacific Nuclear Free Zone [3].

In 1999, South Pacific Forum's members agreed to change the organization's name to Pacific Islands Forum from 2000 with the corresponding renaming of the secretariat. In the 21<sup>st</sup> century, in pursuit of economic integration, PIF is promoting the Pacific Island Countries Trade Agreement (PICTA) [4] and the Pacific Agreement on Closer Economic Relations Plus [5] with the blueprint to establish a free trade zone in the South Pacific region that enables goods and personnel mobilization. However, the full implementation of the plan is still in progress while some PIF members are still sitting on the fence. In addition to the economic dimension, PIF also concerns the increasingly prominent impact of climate change and traditional security issues related to the shift of the global balance of power.

### Organizational Structure & Introduction to Forum Fisheries Agency (FFA)

The Chair of PIF rotates among member states with a one-year tenure. PIF's main administrative body is the PIF Secretariat, which locates in Fiji's capital Suva. The Secretary General of the PIF Secretariat is elected by PIF member states on a tri-annual basis.



PIF also established the Council of Regional Organisations of the Pacific (CROP) to manage professional regional organizations in the South Pacific region. Except for the PIF secretariat, the institutions under CROP include the Pacific Islands Forum Fisheries Agency (FFA), the Pacific Aviation Safety Office, the Pacific Power Association, the Pacific Islands Development Program, the Pacific Community, the Secretariat of the Pacific Regional Environment Programme, the Pacific Tourism Organisation, and the University of the South Pacific [6]. The permanent Chair position of CROP is held by the PIF Secretary General.

Among the various CROP-managed institutions, the FFA interacts frequently with Taiwan. FFA, established in 1979, consists of Tokelau and all PIF members except overseas France territories (New Caledonia and French Polynesia), with Forum Fisheries Committee as its decision-making body. Since most FFA members are PICs, located in the immense Pacific Ocean with copious separate islands as territories, they obtained vast Exclusive Economic Zones (EEZs) after the concept had been adopted as a part of the United Nations Convention on the Law of the Sea. The FFA members' total population contains only 0.55% of the world population [7], but their EEZs constitute 28% of all EEZs in the world [8]. Furthermore, most PICs' EEZs are situated in the tropical area of the Western and Central Pacific Ocean, where abundant tuna resources lie beneath. According to statistics, in 2021 the total weight of tuna caught in FFA members' EEZs comprised 53% of the world's total yield [9][10].

The ample fishery resources in FFA members' EEZs create the space for distant water fishing states, including Taiwan, to acquire fishing rights through negotiation [11]. A part of the FFA members signed the Nauru Agreement to coordinate mandatory requirements toward foreign vessels amongst contracting parties and adopted related Implementation Arrangements (IA) to regulate executive details. The Forum Fisheries Committee enacted the Regionally-harmonized Minimum Terms and Conditions to prescribe the minimum requirements and relevant processes for foreign vessels fishing in FFA members' regions [12]. Parties to the Nauru Agreement (PNA) also control the sum of fishing days in the PNA area through the Vessel Day Scheme in order to limit the total fishing efforts [13]. Now the collection of fees for granting fishing rights to foreign vessels has become an important income for some FFA members. For example, there was a record that revenues from fisheries collaboration reached 91% of Kiribati's annual GDP [14].

FFA plays a vital role in the international fisheries management of the Western and Central Pacific Fisheries Commission (WCPFC) as well. Among the 26 members of WCPFC, more than half (16) members come from FFA. On the formation of WCPFC critical policies, the FFA members usually build consensus through internal consultation and then unitedly engage in fisheries management measure negotiations with Taiwan and other distant water fishing states from the perspective of coastal states.

In addition to internal decision-making, PIF magnifies its influence through dialogues with external countries [15]. PIF has invited non-member states to join the Post Forum dialogue since 1989. PIF subsequently renamed the Post Forum Dialogue mechanism into the Forum Dialogue Partner mechanism, in which cumulatively more than 20 states have participated. Taiwan has participated in the Taiwan/ROC-Forum Countries Dialogue [16], and 27 Dialogues have been held to date since 1993 [17]. Although the Taiwan/ROC-Forum Countries Dialogue was suspended due to the COVID pandemic after 2019, Taiwan continues to promote the Regional Development Assistance Program and the Scholarship Scheme in collaboration with the PIF Secretariat [16].



## Emerging Challenges

PIF has remarkably contributed to forming collective interest and promoting regional integration in the South Pacific region. Nevertheless, grave challenges emerge in recent years. On geopolitics, China's influence over PICs is growing through economic aid and investment as its post-reform economic resurgence. To balance against China, the US published the Indo-Pacific strategy for rebalancing the Pacific region. The PICs and PIF are at the hotspot of the US-China competition.

According to the Chinese Ministry of Foreign Affairs, China has invested in PICs for more than 2.72 billion US dollars [18]. The expansion of Chinese influence and its attempt to extend cooperation to the security dimension put PIF members' internal connections on trial. As a traditional ally of the US and one of the pillars of the Quadrilateral Security Dialogue (QUAD) under the Indo-Pacific strategy, Australia holds divergent interests with China as a revisionist power. Federated States of Micronesia (FSM) and other PICs holding a close relationship with the US are handling cautiously toward possible advancement of cooperation with China. Tuvalu, the Republic of Marshall Islands (RMI), Nauru, and Paulu as Taiwan's allies also hesitate on embracing further coalition between China and PIF.

The former PIF Secretary General Meg Taylor once expressed her concern about the South Pacific region becoming the frontline of great powers' collision: "I find it so offensive that all of a sudden the region that we all come from is defined by people who are great military powers, who have no consideration for the peoples in the region, or our governments in the Pacific, and the lack of deep consultations [19]." While obtaining benefits from China through collaboration, PICs seek for maintaining their relationships with their traditional allies. An example is that Solomon Islands signed a security pact with China, which provisions include that upon Solomon Islands' request, China could send police, armed police, and military personnel to Solomon Islands for assisting in the maintenance of social order. After the deal was leaked, the Solomon Islands received concerns from powers including Australia, Japan, and the US [20] and faced queries from other PICs like FSM [21]. In response, Manasseh Sogavare, the Prime Minister of Solomon Islands, assured that the country would not allow China to establish a military base in its territory and would seek Chinese assistance only if Australia cannot fill in the security gap: "that is not in someone's interest, nor the interest of the region for any military base, to be established in any Pacific island country, let alone Solomon Islands...I think the reason is simple; the reason is regionalism, the moment we establish a foreign military base, we immediately become an enemy. And we also put our country and our people as targets for potential military strikes [22]." Before meeting with 10 PIC Foreign Ministers on May 2022, China proposed the Common Development Vision and the corresponding Five-Year Action Plan, which contains provisions about police training, Confucius Institute establishment, and the PICs' abidance by one-China principle along with non-interference in internal affairs. The FSM Prime Minister sent a letter to PIF members and the US, claiming that the Chinese proposal "threatens to bring a new Cold War era at best, and a World War at worst [23][24]." In the end, the Chinese proposal was not adopted at the Foreign Minister meeting [25].

The dispute on the recent election of the PIF Secretary General revealed the internal sub-regional conflict among PIF members. On February 2021, Henry Puna, the former Prime Minister of Cook Islands, was elected as the next Secretary General of PIF, which triggered outrage from FSM, Kiribati, Nauru, Paulu, and RMI as Micronesian countries. They argued that the gentleman's agreement on rotating the PIF Secretary General's position among the three sub-regions in the South Pacific—Polynesia, Micronesia, and Melanesia—was betrayed by the recent practice. The Micronesian bloc represented that other PIF members ignored Micronesia's need and initiated the withdrawal process from PIF [26]. Owing to the apology from the PIF Secretariat and other PIF members [27] and the reach of consensus on the Suva agreement in midyear, which promised to institutionalize the mentioned gentleman's agreement and to grant Micronesia more representativeness, most members of the Micronesia bloc revoked the decision of withdrawal [28]. However, in July of the same year, Kiribati



argued that PIF did not properly handle Micronesian countries' concerns and announced its withdrawal from PIF with immediate effect [29]. This was the first time in PIF's history that a member declares its withdrawal, which undermined the representativeness of PIF to the South Pacific region.

To resume regional harmony, Sitiveni Rabuka, the Prime Minister of Fiji and the current PIF Chair, visited Kiribati in January 2023. He expressed apology through traditional ceremonies during the meeting with Kiribati's President Taneti Maamau and pleaded for Kiribati's return to PIF [30]. On 30<sup>th</sup> January, Kiribati confirmed its endorsement to rejoin PIF in 2023 through the President's office's official Facebook page [31]. New Zealand soon expressed its welcome toward the decision [32]. The disturbance brought by Kiribati's withdrawal is expected to cease, but whether the wound of discord among South Pacific sub-regions could be healed still depends on the future arrangement and implementation of the Suva agreement.

## Conclusion

The South Pacific region possesses key strategic importance in the US-China rivalry. The shared cultural background and geopolitical interests among PICs determine that regional integration is a proven approach to amplify each PIC's voice in international society. Preserving unity is the essential foundation of PIC's external influence, and it would be a formidable quest among the clash of powers.

In the foreseeable future, PIF is assumed to remain an international organization with the highest level of participating officials and integration in the South Pacific region. PIF will still play a leading role in regional affairs and international politics, yet the continuity of its influence will rely on PIF members' perception of shared interest and their determination of creating and defending such benefits.



Figure / Leaders participated in the 51<sup>st</sup> Pacific Islands Forum, with the current PIF Secretary General Henry Puna sitting in the third seat from the left in the front row

Source/ <https://reurl.cc/5MK8oV>

## References

- [1] Shibuya, E. (2004). The problems and potential of the Pacific Islands forum. *The Asia-Pacific: A region in transition*, 102-115.
- [2] Pacific Islands Forum Secretariat Official Website (Jul. 14, 1980). South Pacific Regional Trade and Economic Co-operation Agreement. <https://www.forumsec.org/wp-content/uploads/2020/05/South-Pacific-Regional-Trade-and-Economic-Co-operation-Agreement-SPARTECA.pdf> (Feb. 13, 2023)
- [3] United Nations Office for Disarmament Affairs Official Website (Aug. 6, 1985). South Pacific Nuclear Free Zone Treaty. <https://treaties.unoda.org/t/rarotonga> (Feb. 13, 2023)
- [4] Pacific Islands Forum Secretariat Official Website (Aug. 18, 2001). Pacific Island Countries Trade Agreement (PICTA). <https://www.forumsec.org/wp-content/uploads/2020/01/PICTA.pdf> (Feb. 13, 2023)
- [5] Pacific Islands Forum Secretariat Official Website (Jun. 14, 2017). Pacific Agreement on Closer Economic Relations Plus. <https://www.forumsec.org/wp-content/uploads/2020/05/PACER-Plus-Text.pdf> (Feb. 13, 2023)
- [6] For the detail of organizations subordinated to CROP, see: Pacific Islands Forum Secretariat, Council of Regional Organisations of the Pacific. <https://www.forumsec.org/council-of-regional-organisations-of-the-pacific/> (Feb. 13, 2023)



## References

- [7] The figure is calculated according to 2021 data from the United Nations Department of Economic and Social Affairs. Data source: United Nations, World Population Prospects 2022. Excluding New Zealand and Australia, the combined population of PICs in FFA only constitutes 0.16% of the world population.  
<https://population.un.org/wpp/Download/Standard/MostUsed/> (Feb. 13, 2023).
- [8] Australian Strategic Policy Institute (Dec. 14, 2021). Bringing the Indian and Pacific Oceans together on IUU fishing.  
<https://www.aspi.org.au/journal-article/bringing-indian-and-pacific-oceans-together-iuu-fishing> (Feb. 13, 2023)
- [9] FFA data source: Pacific Islands Forum Fisheries Agency (FFA) (Jul. 25, 2022). Value of WCPFC-CA Tuna Fisheries 2022.  
<https://www.ffa.int/node/2721> (Feb. 13, 2023)
- [10] Data source of world total tuna yield: Western and Central Pacific Fisheries Commission (Nov. 16, 2022). WCPFC Tuna Fishery Yearbook 2021.  
<https://www.wcpfc.int/doc/wcpfc-tuna-fishery-yearbook-2021> (Feb. 13, 2023)
- [11] For detailed elaboration on patterns of Taiwan fisheries collaboration and related negotiation, see: 行政院農業委員會 (2012), 《耕耘臺灣農業大世紀：漁業風華》(臺北：行政院農業委員會), 89-91。
- [12] Pacific Islands Forum Fisheries Agency (FFA) Official Website (May, 2019). The Harmonised Minimum Terms and Conditions for Access by Fishing Vessels.  
[https://www.ffa.int/system/files/HMTC\\_as\\_revised\\_by\\_FFC110\\_May\\_2019\\_-\\_FINAL.pdf](https://www.ffa.int/system/files/HMTC_as_revised_by_FFC110_May_2019_-_FINAL.pdf) (Feb. 13, 2023)
- [13] For the development of FFA and PNA's fisheries management institution, see: 傅家驥 (2006), 《南太平洋論壇漁業局漁船作業天數機制 (VDS) 對臺灣經銷網漁業管理之影響》(基隆：國立臺灣海洋大學應用經濟研究所碩士論文), 29-38。
- [14] Webb, J (2020). "Kiribati economic survey: Oceans of opportunity." Asia & the Pacific Policy Studies, 7(1): 6-7.
- [15] 蔡東杰 (2007), 〈南太平洋區域組織發展〉, 《台灣國際研究季刊》3(3): 5。
- [16] 中華民國僑務委員會 (2022年9月17日), 〈駐斐濟代表周進發與「太平洋島國論壇」(PIF)簽署2022年至2024年臺灣與PIF秘書處合作協定〉。  
<https://www.ocac.gov.tw/OCAC/Pages/Detail.aspx?nodeid=345&pid=45152893> (Feb. 13, 2023)
- [17] 中華民國外交部 (2019年8月16日), 〈外交部長吳釗燮率團參加第50屆太平洋島國論壇及第27屆「臺灣/中華民國與PIF國家對話會議」成果豐碩〉。  
[https://www.mofa.gov.tw/News\\_Content.aspx?n=95&sms=73&s=68299](https://www.mofa.gov.tw/News_Content.aspx?n=95&sms=73&s=68299) (Feb. 13, 2023)
- [18] 中華人民共和國外交部 (2022年5月24日), 〈中國—太平洋島國合作事實清單〉。  
[https://www.fmprc.gov.cn/web/zyxw/202205/t20220524\\_10691894.shtml](https://www.fmprc.gov.cn/web/zyxw/202205/t20220524_10691894.shtml) (Feb. 13, 2023)
- [19] Radio New Zealand (May 31, 2021). Outgoing Pacific Forum head warns about external influences.  
<https://www.rnz.co.nz/international/pacific-news/443728/outgoing-pacific-forum-head-warns-about-external-influences> (Feb. 13, 2023)
- [20] Vivekananda International Foundation (Jun. 22, 2022). The China-Solomon Islands Bilateral Security Pact.  
<https://www.vifindia.org/brief/2022/june/2/The-China-Solomon-Islands-Bilateral-Security-Pact> (Feb. 13, 2023)
- [21] The Guardian (Mar. 31, 2022). Pacific leader urges Solomon Islands to rethink China security deal.  
<https://www.theguardian.com/world/2022/mar/31/pacific-leader-urges-solomon-islands-to-rethink-china-security-deal> (Feb. 13, 2023)
- [22] The Guardian (Jul. 14, 2022). Solomon Islands PM rules out China military base and says Australia is 'security partner of choice'.  
<https://www.theguardian.com/world/2022/jul/14/solomon-islands-pm-rules-out-chinese-military-base-china-australia-security-partner-manasseh-sogavare> (Feb. 13, 2023)
- [23] The Common Development Vision proposed by China, see: DocumentCloud (undated, contributed by Australian Broadcasting Corporation), China-Pacific Island Countries Common Development Vision.  
<https://www.documentcloud.org/documents/22037011-china-pacific-island-countries-common-development-vision> (Feb. 13, 2023)
- [24] The Common Development Vision five-year action plan and the FSM Prime Minister's letter to PIF members and the US, see: Radio New Zealand (May 27, 2022), FSM president warns Pacific leaders over China documents. The quotation is from page 7, FSM Prime Minister's letter.  
<https://www.rnz.co.nz/international/pacific-news/467955/fsm-president-warns-pacific-leaders-over-china-documents> (Feb. 13, 2023)
- [25] BBC News 中文 (2022年6月1日), 〈中國—太平洋島國外長會聯合聲明「難產」的背後〉。  
<https://www.bbc.com/zhongwen/trad/chinese-news-61651994> (Feb. 13, 2023)
- [26] The Guardian (Feb. 8, 2021). Pacific Islands Forum in crisis as one-third of member nations quit.  
<https://www.theguardian.com/world/2021/feb/09/pacific-islands-forum-in-crisis-as-one-third-of-member-nations-quit> (Feb. 13, 2023)
- [27] Radio New Zealand (Apr. 29, 2021). PNG leader says Forum apology to Micronesia just the start.  
<https://www.rnz.co.nz/international/pacific-news/441422/png-leader-says-forum-apology-to-micronesia-just-the-start> (Feb. 13, 2023)
- [28] The Guardian (Jun. 8, 2022). Pacific leaders reach crucial deal to restore political unity, as China's interest in region accelerates.  
<https://www.theguardian.com/world/2022/jun/08/pacific-leaders-reach-crucial-deal-to-restore-political-unity-as-chinas-interest-in-region-accelerates> (Feb. 13, 2023)
- [29] The Guardian (Jul. 10, 2022). Kiribati withdraws from Pacific Islands Forum in blow to regional body.  
<https://www.theguardian.com/world/2022/jul/10/kiribati-withdraws-from-pacific-islands-forum-pif-micronesia> (Feb. 13, 2023)
- [30] The Guardian (Jan. 30, 2023). Kiribati to return to Pacific Islands Forum at vital moment for regional diplomacy.  
<https://www.theguardian.com/world/2023/jan/30/kiribati-to-return-to-pacific-islands-forum-at-vital-moment-for-regional-diplomacy> (Feb. 13, 2023)
- [31] Office of Te Beretitenti (Jan. 30, 2023). The Government of Kiribati has formally reinstated its positive endorsement to rejoin the Pacific Islands Forum this year 2023.  
<https://www.facebook.com/ob.gov.ki/posts/pfbid02pdnCsep4tRyqiaGtSsqccyJ7F96yZ8hDjgLc8w9rY6NESZtj8ke24ww2UJWwZ3Nbl> (Feb. 13, 2023)
- [32] Stuff (Feb. 2, 2023). NZ welcomes Kiribati back to the Pacific Islands Forum family.  
<https://www.stuff.co.nz/pou-tiaki/131129287/nz-welcomes-kiribati-back-to-the-pacific-islands-forum-family> (Feb. 13, 2023)



## Introduction to Pacific Community (SPC)

Shirley Shih-Ning Liu (Secretary, Overseas Fisheries Development Council of the Republic of China)

Keywords: South Pacific Islands, World War II, Colonial Powers, Non-Political, Regional Organization

Scattered across the Pacific Ocean, the Pacific islands are categorized into three major island groups: Polynesia, Micronesia, and Melanesia. The Pacific island countries are widely known for the rich Austronesian culture heritage and the scenic views. Tahiti and Fiji, for example, are two of the most known tourist resorts in the world. In Taiwan, some people may have come to know this region through Taiwan's international affairs, since most of Taiwan's diplomatic allies are located in this region.

During the past century, the Pacific island countries established multiple regional organization under the impact of globalization. Among these organizations, the Pacific Community (SPC, abbreviation retained from its precedent South Pacific Commission) is one of the pioneers. Its 27 members today are American Samoa, Australia, the Cook Islands, Federated States of Micronesia, Fiji, France, French Polynesia, Guam, Kiribati, the Marshall Islands, Nauru, New Caledonia, New Zealand, Niue, the North Mariana Islands, Palau, Papua New Guinea, the Pitcairn Islands, Samoa, the Solomon Islands, Tokelau, Tonga, Tuvalu, the United Kingdom, the United States, Vanuatu, and Wallis and Futuna.

### The Precedent: South Pacific Commission

The Pacific War broke out after Japan attacked Pearl Harbor during World War II. To ally against the Japanese troops, the United States, the United Kingdom, Australia and New Zealand took part in battles in the region, many of the major land attacks took place in south Pacific islands such as Fiji, Tonga and the Solomon Islands. In fact, the capital of the Solomon Islands, Honiara, is located on one of the islands where bitter war took place. The Pacific War left the south Pacific trampled lands and brought about regional power shifts. To safeguard the peace and stability of this region, the six western countries that had established interest and trust territories in the region, namely the United Kingdom, the United States, the Netherlands, France, Australia and New Zealand, signed Canberra Agreement in 1947 and established the South Pacific Commission [1].



Figure 1/ The first SPC Temporary Headquarters, Mosman, Sydney, Australia  
Source/ <https://www.spc.int/about-us/history>



The Canberra Agreement proposed to coordinate the efforts of separated Pacific islands administrations through joint discussion and research. It invited government representatives from the six founding countries, while the territories were not invited to participate [2]. Following the Agreement, the South Pacific Commission aims to provide consultation support on the management issues on Pacific territories, with the goal to enhance the economic, social and livelihood, including public health and social welfare. Headquarter set in Nouméa, New Caledonia, the South Pacific Commission established three divisions to address issues on land, marine resources and social affairs, respectively, while the regional offices across the Pacific islands oversaw the execution of projects.

### From South Pacific Commission to Pacific Community (SPC)

In 1950, the South Pacific Commission established South Pacific Conference, participated by delegates from the Pacific island territories [3]. The South Pacific Conference was the first platform for the native people of the region to voice their needs, but political matters are excluded purposefully by the founding members. Following the independence of West Samoa in 1962 came the 30-year process of decolonization. With rising national consciousness, more and more Pacific leaders started to question the "no politics" restriction and considered it a way for the colonial powers to remain in control over the region. Nevertheless, the growing annoyance toward this rule and negative feedback did not change the minds of the founding members.

Under the "no politics" repress, South Pacific Commission unexpectedly incentivized the development of other new regional organizations, such the Pacific Islands Producers' Association (PIPA), which intended to explore overseas market for Pacific agriculture products. In PIPA's case, although the ideal level of political self-determination was not achieved at the time, it demonstrated the wills among the Pacific Islands to forge further cooperation and was regarded as a key step forward. PIPA's achievement led to its inclusion into another newly established international organization in 1971 called the South Pacific Forum (SPF), which later become Pacific Islands Forum (PIF), a key political and economic body in the Pacific region today.

Back in South Pacific Commission, it was not until 1974 that the founding members decided to make South Pacific Conference an annual joint conference with the Pacific Islands. The joint meeting welcomed discussion on substantial matters such as financial issue, priority tasks, cooperating parties, and officer appointments; however, the participating rights did not keep up. At the early stage, voting rights were granted only to some of the independent Pacific countries beside the five founding members (the Netherlands withdrew in 1962; The United Kingdom withdrawn twice in the 2000s, lastly rejoined in 2021). After years of debate among members, including between small and big island countries, the rest of the island members finally enjoyed equal rights in 1983 at the 23<sup>rd</sup> South Pacific Conference, under the endeavor of the Secretary-General, Francis Bugotu (Solomon Islands). In this meeting, the non-political nature of the Commission was again stressed.

To reflect its Pacific-wide membership, the South Pacific Commission changed its name to the Pacific Community (SPC) at its 50<sup>th</sup> anniversary and carried over the abbreviation "SPC" as it had been widely used and recognized in the region. SPC proactively supported Pacific Islands with trainings on medical, hygiene, economy and social aspects, including biodiversity, food system, equality, education, and social development, and carried out national programs as well as supporting projects of international organizations. The majority of the SPC fundings were from regular contributions and donation from the five founding members, other donors include the European Union and organizations under the United Nations and so on.



## Achievements and Challenges of the SPC

Today, SPC is an important non-political organization in the Pacific region. It conducts scientific research and provides technical consultation, aiming to support the development of the Pacific Island countries and territories. To adapt to the social and natural environment and the new needs of the South Pacific region, the divisions under SPC have been expanded on a large scale. The original three divisions, land, ocean and social, were further expanded, and new divisions such as climate change, education, fisheries, public health, statistics have also been established.

One of SPC's divisions, the Division of Fisheries, Aquaculture and Marine Ecosystems (FAME), is the department that Taiwan interact frequently and had direct impact on Taiwan's policy. FAME consists of the Oceanic Fisheries Program (OFP) and the Coastal Fisheries Program (CFP), which produce data on tuna species and coastal fisheries respectively, and SPC-OFP is also the scientific service provider of the Western and Central Pacific Fisheries Commission (WCPFC), to which Taiwan is a member. Each year, the scientists of the SPC-OFP analyze fisheries data from Taiwan and other WCPFC member countries, carry out research project, present the stock status of marine resources, and provide recommendations and advices. As stock assessment is the basis for management, SPC-OFP plays an important role in shaping the WCPFC conservation and management measures, which is also a key source of Taiwan fisheries regulations. With each regional fisheries management organization (RFMO) continues to highlight the implementation of science-based management, it is fair to say that SPC-OFP is one of the major contributors in international fisheries policy.



Figure 2/ The Islands of the Pacific

Source/ <https://www.pourquoi.tw/intlnews-neasia-210723-210729-01/>



In an ever-changing world, non-political organization like SPC may still be involved in politics at least to some extent. In 2015, China included south Pacific countries in its Belt and Road Initiative, putting the geopolitical tension of the region in international spotlight again. In SPC's vision statement and long-term strategy, it mentions the pursuit of regional peace, and emphasizes the alignment with the 2050 Strategy for the Blue Pacific Continent. The Strategy outlined key concerns of the region's challenges, including climate change impacts, the geostrategic competition, and the other region vulnerabilities. Not only was it developed by the Pacific Islands Forum, a platform which political discussions take place, it also guides other political group such as the Partners in the Blue Pacific (PBP), an informal group established by the United States in 2022 that is often considered as an initiative to counter China's growing influence in the Pacific region. Sharing a common strategy with so many politics-involved organization, the SPC is likely to be an arena for soft power competition.

## Conclusion

With a core shaped by the colonial powers and the membership reflecting the Pacific islands' national self-determination, the SPC witnessed the unique decolonization process of this region. Under this context, SPC remains a non-political body and interact with its members through scientific and consultation services, thus avoiding centralized operation and potential conflicts [5]. Now that China has shown clear ambition in this region, we should continue to observe how SPC supports the region while remaining political neutral, and whether or not it addresses power shifts in the region.

Meanwhile in Taiwan, we could further explore avenues to strengthening links between Taiwan and the south Pacific nations. In terms of national policy, Taiwan's government launched the New Southbound Policy (NSP) in 2016 to bolster economic and diplomatic ties with partners across the region. In the "2022 Yushan Forum: Asian Dialogue for Innovation and Progress", President Ing-Wen Tsai mentioned how Taiwan has long been sharing climate monitoring technology and natural resource preservation knowledge with the Pacific countries. Not only will the NSP be at the center of Taiwan's Indo-Pacific strategy, it will also be integrated with Taiwan's digital technology and further foster a digital New Southbound initiative [6]. In terms of private sectors, Taiwan's distant water fisheries are important actors in interactions with the Pacific islands. Our tuna purse seiners and tuna longliners has longstanding partnership with the coastal countries through fishing access agreement and vessel chartering [7]. In sum, for Taiwan to extend our soft power, and particularly in supporting the Pacific islands, there may be something we could learn from SPC's experience.

## References

- [1] 許世旭 (2007), 《澳洲的南太平洋政策研究：新區域主義的觀點》(國立政治大學碩士論文), 115-153。
- [2] McKay, C. G. R. (1947). The Canberra Proposals for a South Pacific Commission. *The Journal of the Polynesian Society*, 56(2): 158-162.  
<http://www.jstor.org/stable/20703094>
- [3] Robson, N. (1950). The Suva conference of South Pacific peoples. *Australian Journal of International Affairs*, 4(3): 179-185.
- [4] US Department of State (2022). Readout of The Partners in the Blue Pacific (PBP) Ministerial.  
<https://www.state.gov/briefings-foreign-press-centers/readout-of-the-partners-in-the-blue-pacific-ministerial> (Feb. 1, 2023)
- [5] 楊聰榮 (2005), 〈太平洋史視角下的獨立運動史：弱勢國家的生存策略〉, 《臺灣史學雜誌》2: 83-100。
- [6] 新頭殼Newtalk (2022年10月7日), 蔡英文：後疫情時代 推動「數位新南向」將是台灣在亞洲的關鍵區域政策。  
<https://tw.news.yahoo.com/news/%E8%94%A1%E8%8B%B1%E6%96%87-%E5%BE%8C%E7%96%AB%E6%83%85%E6%99%82%E4%BB%A3-%E6%8E%A8%E5%8B%95-%E6%95%B8%E4%BD%8D%E6%96%B0%E5%8D%97%E5%90%91-%E5%B0%87%E6%98%AF%E5%8F%B0%E7%81%A3%E5%9C%A8%E4%BA%9E%E6%B4%B2%E7%9A%84%E9%97%9C%E9%8D%B5%E5%8D%80%E5%9F%9F%E6%94%BF%E7%AD%96-040421277.html> (Feb. 1, 2023)
- [7] 中華民國對外漁業合作發展協會, 合作現況—111年我國漁船與沿海國合作情形。  
<https://www.ofdc.org.tw:8181/web/app/display.xhtml?id=2#CurrentStatus> (Feb. 9, 2023)



# Introduction to the Good Practice Guidelines In Environmental Impact Assessment (EIA) for Coastal Engineering In The Pacific

Compiled by Jia-Lin Chen (Associate Professor, Department of Hydraulic & Ocean Engineering, National Cheng Kung University); Wei-Zhan Tsai, Cheng-Chien Hou, Tsai-Ling Chuang, Wen-Tai Wen, and Bo-Hsun Jiang (Master Degree Students, Department of Hydraulic & Ocean Engineering, National Cheng Kung University)

Translated by Linguitronics

Keywords: Coastal engineering, Secretariat of the Pacific Regional Environment Programme (SPREP), Environmental Impact Assessment (EIA), engineering mitigation strategies, sustainable development

The main purpose of conducting Environmental Impact Assessments (EIA) is to minimize the impact of development projects on local ecology, communities and environment while maximizing project benefits. Meanwhile, acquiring knowledge of the local environment and the participation and cooperation of relevant stakeholders can in turn lay a good foundation for the EIA. When an EIA is implemented correctly, it can effectively reduce the negative impacts of development projects on the environment, improve the climate change resilience of the site, and realize the Sustainable Development Goals (SDGs) advocated by the United Nations.

## Secretariat of the Pacific Regional Environment Programme (SPREP)

The Secretariat of the Pacific Regional Environment Programme (SPREP) is a multinational government organization whose main purpose is to support activities related to environmental governance and sustainable development of islands around the Pacific Ocean. Environmental governance can offer the peoples and environments of the Pacific region with the greatest benefits, but good environmental governance needs to be supported by proper planning and regulations that mitigate adverse impacts and enable appropriate environmental management so as to realize the potential benefits. Each year, SPREP compiles the activities and achievements of different departments and releases an annual report. In particular, the organization provides a reference process for EIA in the Pacific region through the following characteristics (2016) [1]:

- Emphasize the importance of assessing potential impacts on the environment and development, especially with regard to climate change and disaster-related impacts.
- Emphasize the importance of stakeholders in the EIA process.
- Emphasize the importance of designing mitigation measures according to the EIA process.
- Provide guidelines for the EIA process, including templates and checklists for EIA screening, scoping, reporting, environmental monitoring and management planning, review, and risk assessment.
- Provide the basic information that needs to be known before an investigation is conducted, as well as the forms of evaluation applicable to different situations.
- Introduce the concept of environmental assessment, and determine which development forms and



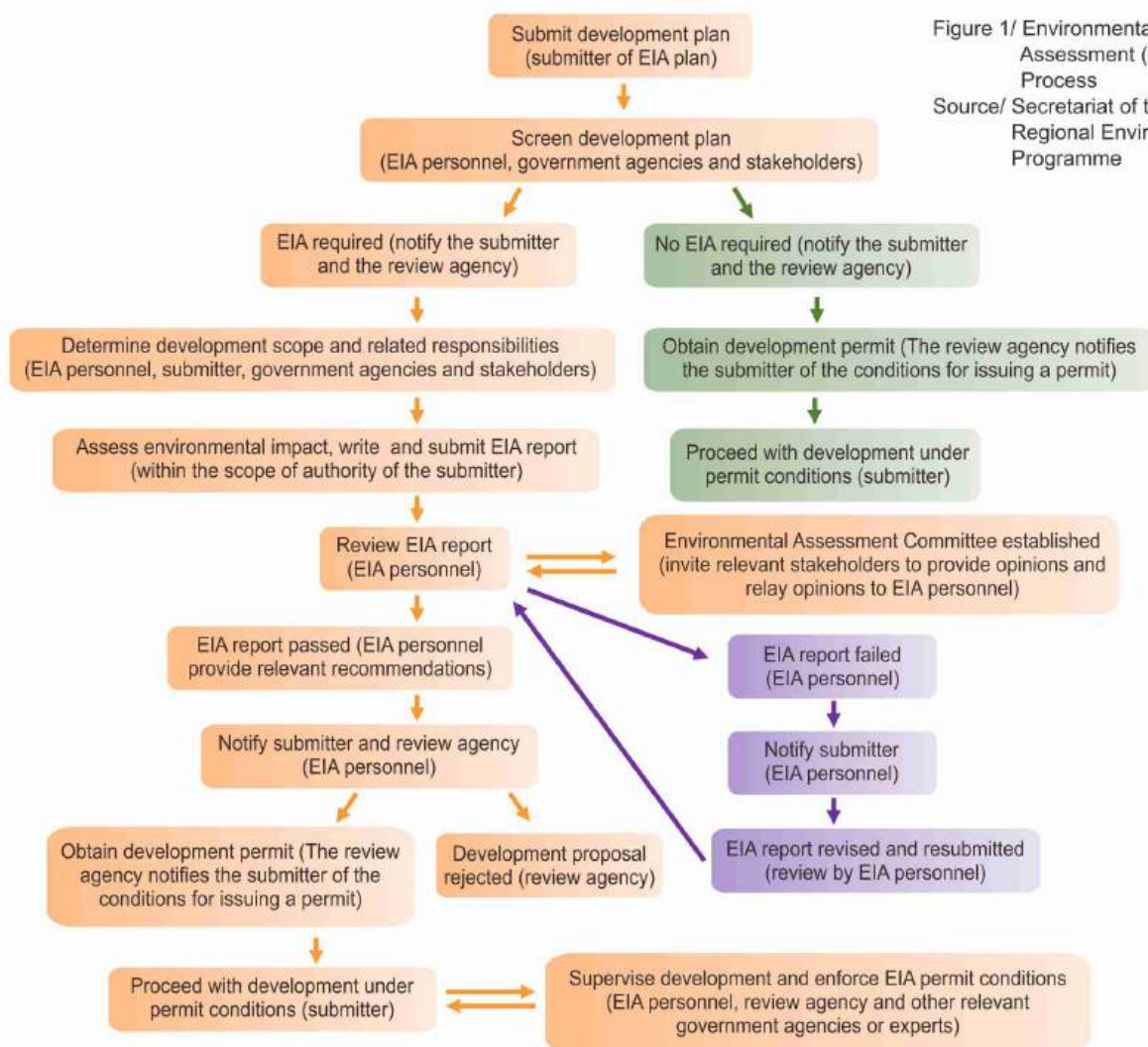


Figure 1/ Environmental Impact Assessment (EIA) Process  
Source/ Secretariat of the Pacific Regional Environment Programme

methods are harmless to the environment, which can be used as the information needed for environmental assessment, such as understanding where development is permitted or not permitted, specifying specific types of development, and roughly establishing environmental management measures.

- List considerations and recommendations for effective EIA in the Pacific region.
- The organization can also provide guidance if Pacific island countries wish to formulate their own national EIA guidelines.
- Integrate the EIA process with multilateral environmental agreements (MEAs).

This reference process contributes to environmental stewardship and the increase of awareness in the Pacific region, as detailed in Figure 1.

## Coastal Systems and Engineering

Coastal areas are where surface biological activities and physical phenomena occur most frequently. The location of the coastline will change with tides and seasons, and will shrink or grow with the erosion of wind, waves and ocean currents, and it will also exhibit changes in scale when affected by sea level rises over longer periods of time. Figure 2 shows an idealized Pacific island where the majority



of the coastline is composed of sandy soil and coral reefs. It has a rich variety of ecological environments such as beaches, coasts, estuaries, seagrass, mudflats, coastal lagoons and wetlands. The coral reef coast provides spawning, seedling culturing, refuge and foraging areas for a large number of organisms, and it breeds about 25% of marine life. Coral reefs also serve as natural breakwaters to protect the coast and reduce coastal erosion.

The geomorphology, geology, biodiversity, and human influence of coastal systems create extensive and complex ecosystems. It is, however, not easy to strike a balance between human activities and ecological sustainability. In recent years, due to climate change factors such as rises in seawater temperature, changes in rainfall intensity and frequency, and sea level rises, the coastal areas of the Pacific Islands have become more prone to extreme disasters. Therefore, coastal engineering also needs to give consideration to climate change factors as well as existing marine physics, geology, ecology and human environments so as to achieve the purpose of mitigating the issues encountered in coastal areas.

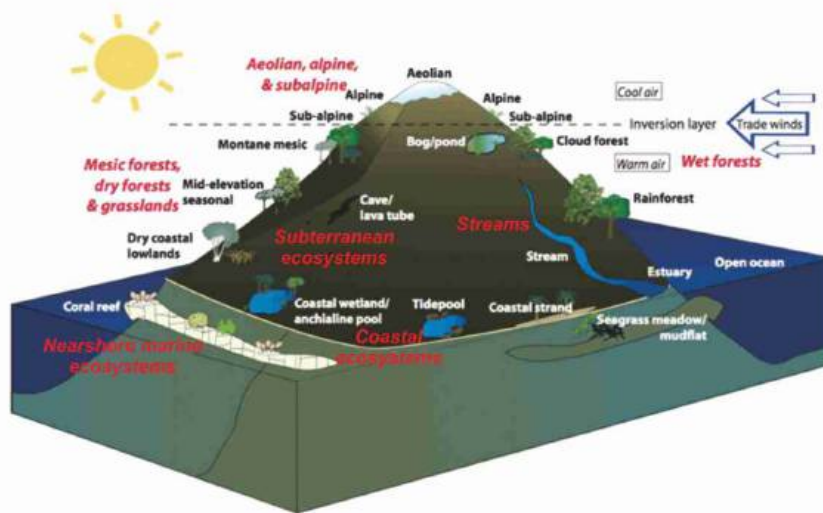


Figure 2/ Idealized Pacific island with high mountains. The figure shows a typical coastal system and the division of 6 key ecosystems (in red) of the Pacific Island Network

Source/ Stephens, S. H., and Daniel, R. G. (2006)

Coastal engineering refers to the planning, design, construction and maintenance of projects aimed at protecting or transforming coastlines, land reclamation, prevention of coastal land subsidence, facilitation of navigation and provision of marine facilities, and enhancement and restoration of the ecosystem. This section briefly describes several different forms of coastal engineering that are relevant to the Guidelines, including excavation and dredging, land reclamation, breakwaters, seawalls, jetties, and beach maintenance, etc.

#### ● Port and channel dredging

The islands in the Pacific achieve development through port trade, making the construction of ports and site selection extremely crucial. For example, the territory of the Kingdom of Tonga is scattered in the South Pacific, and each island can only communicate with the outside world through ports. Ports located on sandy shores, however, share a common issue—port siltation. Therefore, dredging projects carried out in these ports is extremely crucial. Through dredging, navigation in the ports can remain unimpeded, and the dredged sand can be used as an important material for coastal beach maintenance.

#### ● Land reclamation

Land reclamation is one of the methods used to cope with sea level rise, and can be utilized to increase the land area of island countries. Land reclamation can be carried out in inland swamps, wetlands or river areas; for instance, the land area in South Tarawa, Kiribati was increased by about 330 hectares to prevent flooding. However, improper land reclamation planning and assessment will also increase the flood risk of the reclamation area and adjacent areas, and pose a threat to the ecology of the region.

#### ● Jetty and off-shore embankment

Jetties usually protrude from land into the sea, and, if well designed, can protect ships and the shoreline



from waves and prevent silting of waterways. Jetties are often associated with offshore installations such as harbors or breakwaters, which provide protection from tidal waves. Offshore dikes can also provide shoreline protection; however, if not properly designed, they can transfer tidal wave energy to adjacent areas, thus increasing the speed of erosion or deposition.

- **Seawalls, breakwaters, and other common erosion-prevention structures**

Seawalls and breakwaters are structures commonly used to prevent erosion of coastal landscapes and infrastructure, and to reduce risks to human populations and economic activities. Coastal structures are often constructed using non-natural materials such as concrete, large stone blocks, steel (baskets and blocks), or timber. Although with a relatively long design lifetime (typically 50 years) and located in fixed spaces in otherwise dynamic coastal areas, such rigid structures have the potential to cause beach downdrift erosion.

- **Beach maintenance**

"Artificial beach nourishment" is the practice of placing sediment on a beach to increase its width. Often referred to as "flexible construction", it is considered an alternative to rigid construction. As long as the supply of sediment can be maintained, beach maintenance is likely to become more common. However, in the Pacific region, beach maintenance requires filling or dredging from the subtidal zone; as such, projects need to be strictly regulated by laws and regulations in both the areas maintained and those from which sand is mined, and EIA need to be conducted to ensure that maintenance remains sustainable.

- **Nature-based Solutions (NbS)**

In coastal engineering projects, natural solutions include constructed wetlands, seagrass restoration, coral gardens, coral reef restoration, artificial reefs, and planted mangroves, etc. These options can be implemented independently or combined with other engineering measures to increase the potential benefits (for example, combined with artificial reefs or offshore breakwaters to encourage the growth of coral vegetation).

- **Design discharge outlets for wastewater discharge, mooring structures and shoreline connection discharge points**

To attain the purposes of good sewage management and disease prevention, well-designed and well-operated outfalls can effectively dilute the sewage content in natural water bodies and achieve the purpose of reducing the concentration of pollutants [3]. Poorly designed or poorly located drains will result in ineffective dilution or poor circulation that will reduce water quality.

- **Aquaculture**

Aquaculture refers to the farming of marine and freshwater species (such as fish, shellfish, and seaweeds) that can range from land-based to open-ocean farming, of which the 3 main types are: 1. In-land pond systems: Cultured species are placed in interconnected in-land ponds and the pond water is exchanged through pumping. 2. Net pens: Cultured species are fixed with anchor cables in open net pens, and the water inside and outside the net pen is exchanged through natural seawater circulation. 3. Circulatory systems: Cultured species are placed in a pond or tank, usually indoors, and the water exchange needs to be strictly designed and controlled.

## Mitigation Strategies for Coastal Systems and Engineering Projects

Coastal engineering projects may have different degrees of impact, and the importance of these impacts needs to be assessed through EIA. The approach taken here [4] aims to link activities with potential outcomes so as to consider possible mitigation measures. When proposing mitigation measures, the order of mitigation should be considered. This suggests that mitigations should be prioritized in several ways:



- Avoid negative effects, e.g.: Site development avoids encroachment on important habitats.
- Minimize the scope of negative impacts where they cannot be avoided, e.g.: Breakwaters are designed to minimize footprint while meeting applicable design criteria to reduce impacts on benthic habitats.
- Repair or remedy residual negative effects, e.g.: Replant vegetation in areas that have been cleared.
- Offsetting the impact where remediation is impossible, e.g.: Proceeding with the project means that the site no longer serves as a suitable habitat for mangroves, therefore mangroves should be planted in areas at a distance from the site to offset the impact.

To mitigate the impact of engineering projects on coastal processes, project sponsors may also employ the following mitigation strategies:

- Careful siting and modification of the development layout to minimize impact on coastal processes. The key to the design of the development layout is to carry out numerical modeling of different schemes, and obtain the preferred scheme after testing to minimize the physical impact and corresponding biological impact.
- Plan projects carefully. If the project is located in an intertidal zone, on a beach or on a reef platform, all excavated material should be immediately moved to a designated storage area. Construction work in the excavation area must be completed within one tidal cycle (it is not recommended that work continues through two floodtimes); it is also necessary to ensure that work can be completed before the arrival of extreme events (such as typhoons).
- Minimize the removal or logging of any vegetation on the site's shoreline and incorporate natural solutions into the design.

## Conclusion

As climate change continue to cause an increasing number of challenges (such as extreme weather events, droughts, floods, coastal erosion, land salinization, coral bleaching, and changes in fish migration paths), and global economic fluctuations and marine debris continue to exert negative impact on the Pacific island countries and surrounding regions, applying the EIA system established by SPREP to coastal engineering plans and proposing feasible engineering mitigation strategies has become an issue of utmost urgency. This article briefly introduces the good practice guidelines for EIA recommended by SPREP, which can be used as a reference for domestic engineering planning units and project sponsors when making decisions and planning.

## References

- [1] Secretariat of the Pacific Regional Environment Programme (SPREP) (Sep. 28, 2017). SPREP Launches 2016 Annual Report. <https://www.sprep.org/news/sprep-launches-2016-annual-report>
- [2] Stephens, S. H., and Daniel, R. G. (2006). Appendix H: Conceptual models and ecological overview of Pacific Island Network ecosystems. In L. Haysmith, F. L. Kiasner, S. H. Stephens, and G. H. Dichus, Pacific Island Network vital signs monitoring plan. Natural Resource Report NPS/PACN/NRR—2006/003 (Fort Collins, Colorado: National Park Service).
- [3] Tate, P. M., Scaturro, S., and Cathers, B. (2016). Marine Outfalls. In M. R. Dhanak, and N. I. Xiros, Handbook of Ocean Engineering (New York City: Springer Handbooks), 711-740.
- [4] Secretariat of the Pacific Regional Environment Programme (SPREP) (2022). Good Practice Guidelines in Environmental Impact Assessment for Coastal Engineering in the Pacific. Apia, Samoa. <https://library.sprep.org/content/good-practice-guidelines-environmental-impact-assessment-coastal-engineering-pacific>



## Ocean Governance in The Pacific Islands Area: Some Lessons

Kath Tseng (Assistant Professor, Department of Government and Law, National University of Kaohsiung)

Keywords: Ocean Governance, Pacific Islands Regional Ocean Policy (PIROP)

The Pacific Islands Regional Ocean Policy (PIROP) was established in 1999, with a goal to develop a common policy for the Pacific Islands communities. The PIROP was endorsed by Pacific Island Forum Leaders in 2002 [1], while intended to be a template for the Pacific Island Countries and Territories (PICTs) "to adopt and adapt in the development of national policy, reflecting the range of interests, priorities and capacity within the region" [2]. Therefore, the PIROP's establishment paved a way for the realization of a unique regional approach to ocean governance, while serving an exemplary case of a comprehensive integrated ocean policies in the Pacific Islands area [3].

### Overview

This action has been driven by the awareness of the importance of oceans to the Pacific Island communities, as both a medium for transport and a source of food, tradition and culture. In other words, this such common policy has aimed at harmonious co-existence between the Islanders and the ocean, in this region particularly, while improving the Islanders' livelihood upon the reality of their heavy dependence on the ocean and the particular vulnerability of these Communities to environmental, economic and social circumstances.

Against this backdrop, the forming and operation of PIROP has been hinged upon sustainable development, a principle that gains universal acceptance as well as regional consensus in the promulgation and implementation of marine policy. This can be reified further in the guiding principles held to advance and refine PIROP [4]:

- To improve our understanding of the ocean;
- To sustainably develop and manage use of ocean resources;
- To maintain the health of ocean;
- To promote the peaceful use of the ocean;
- To create partnerships and cooperation.

Furthermore, the founder had intended to establish the PIROP to be the basis for the harmonisation of national and regional actions, over the management and development of oceanic and coastal resources in the Pacific Islands, to which the Pacific Islands Regional Ocean Forum's Framework for Integrated Strategic Action (PIROF-ISA) was accordingly enacted in 2005 [5]. Meanwhile, compliance to existing international law and norm is deemed of critical importance to subsequent development of PIROP, with which the Pacific Island countries has been urged to join international treaties and conventions, such as the United Nations Convention on the Law of the Sea (UNCLOS) [6].

### Vulnerability of the Pacific Islands and Implication on Regional Marine Policy

Professional policy-making and its implementation of marine affairs requires following criteria: political will and support, institutional capacity demonstrated in relevant expertise and required



resources, and integrated decision-making that can integrate professional opinions and political decisions while duly reflecting public opinions. That said, leaving aside domestic power struggles, political will and support can be mobilized via regional countries' dealing of imminent threat brought by endemic challenges, which can most vividly be embodied in the particular vulnerability that characterizes the regional countries' overall development. This such vulnerability comprises factors in the environmental aspect, as well as in the economic and social ones [7]. In the environmental aspect, these following factors are of weighing reference: climate variability, climate change and sea-level rise, immediate natural hazards such as earthquakes, tsunamis and volcanic events, fragile ecosystems and natural resource bases, and geographic isolation. In the economic aspect, limited land areas and freshwater resources, limited local markets, high import dependencies, fluctuating world prices for commodities and isolation, are factors explicitly mentioned while being attached with considerable importance. In the social aspect, factors considered important are population growth and distribution, human and food security, external influences, cultural dilution and loss of traditional knowledge and practices. It is by incorporating these factors in various aspects that the Pacific Island countries' marine policy-making and implementation could be refined, to serve their respective interests while attentive to regional needs.

### Ocean Governance and Decision-Making: The Status

In the Pacific Ocean where regional countries are surrounded by vast oceans, a dominant feature of the environment covering about 98 percent of the region and a potential basis for economic development, an integrated approach is deemed a prerequisite to realise sustainable development via the balancing among economic growth, societal development and environmental preservation. To this end, a governance framework for ocean management is indispensable, which can be rather complex at a regional scale. The Pacific Island countries therefore create a framework, to coordinate and integrate the originally country-specific marine management, while urging regional countries to achieve an integrated approach to promote cooperation and collaboration and avoid conflicts out of their self-centric policy action. In this sense, the regional architecture in the Pacific Ocean is important.

Under the regional framework of ocean governance, the following six organisations composed of the 26 Pacific Island and metropolitan countries (five countries having direct interest in the region, including Australia, France, New Zealand, U.K. and the U.S.) are the main institutions, namely, the Pacific Community (SPC) (including the PICTs); the Pacific Islands Forum (PIF) (which also houses the Office of the Pacific Ocean Commissioner [OPOC]); the South Pacific Regional Environment Programme (SPREP); the University of the South Pacific (USP); the Pacific Islands Forum Fisheries Agency (FFA); and the South Pacific Tourism Organisation (SPTO), which has been less engaged in regional ocean management.

These institutions constitute the Council of Regional Organisations in the Pacific (CROP), with the Marine Sector Working Group (MSWG) of CROP serving to coordinate their works. Besides, there are stakeholder organisations to decision-making over ocean management and marine resource reservation in the Pacific region, such as the Pacific Ocean Alliance (POA), regional fisheries management organisations (RFMOs), international organisations, civil society groups and international nongovernment organisations (NGOs). Currently, PIROP is vested a fundamental role in steering thru the region's ocean policy-making.

The CROP serves a key role in this regional governance framework, which is made up of the CEOs of nine regional organisations, including FFA, PIF Secretariat, SPC, SPREP, SPTO and USP to which marine-related activities constitute a major focus in their mandates. The CROP is supported by working groups that provide advice over cross-cutting issues generally straddling various marine sectors, including one most relevant to ocean policy-making and implementation, the MSWG. The Secretary General of the Pacific Islands Forum Secretariat chairs the CROP, which is a tenure position.



The composition and operation of the CROP is accentuated with the comprehensiveness of its membership, which includes the mixes of sovereign states and independent territories. However, a broad range of membership as such inevitably brings with it institutional challenge in policy-making, particularly in framing policy priorities among a variety of issues having critical urgency to the regional ocean management, such as climate change, fishing rights and trade between the Island members and metropolitan members. The members had thus been driven to adopt the "Pacific Way" of dialogue and decision making by consensus" to address these challenges [8].

To further complicate the picture, stakeholder actors are also keen to take part in the decision-making and implementation of the region's ocean management, which include RFMOs, subregional groupings, traditional development partners in the form of metropolitan countries, newer development partners in the form of foundations and private sector investors, international non-government organisations, civil society organisations, international organisations, and distant water fishing nations [9].

Despite the Pacific Islands Regional Ocean Forum's Framework for Integrated Strategic Action (PIROF-ISA) released in 2005 [1], the focus of ocean management and policy implementation continues to be framed from sectoral perspectives, while fixed on fragmented management arrangements [8]. This reifies the difficulties of implementing ocean policies at a regional scale and of finding practical pathways to integrated policies.

To address the inefficiency in regional ocean policy implementation, the Pacific Leaders endorsed the Framework for a Pacific Oceanscape (FPO) in their annual meeting in 2010 [10]. The Pacific Leaders had intended to use FPO an instrument parallel to PIROP, while replacing the not-so-productive PIROF-ISA mechanism. Therefore, the FPO had since been vested with the task of sustainable development, management and conservation of the region's diverse ocean and island ecosystems. Furthermore, the FPO has aimed at improving ocean governance in the region for certain prescribed objectives and actions, while suggesting the organization capable in delivering the proposed adjustment.

In 2011, the Pacific Islands Forum leaders took further actions under the FPO by nominating the Secretary General of the Pacific Islands Forum Secretariat as the Pacific Ocean Commissioner. The CROP endorsed this new post, while assigning a new Secretary General, Dame Meg there to. The Pacific Ocean Commissioner is held responsible to form and shape ocean governance policy agenda, by identifying priorities and providing advisory to the FPO and PIROP, given the broader remit of the Pacific Ocean Commissioner that covers 23 PICTs.

In 2014, the 16 Pacific Islands Forum members had initiated a new Framework for Pacific Regionalism (FPR) [11], as a result out of the review of the Pacific Plan [12]. This review found that the Pacific Plan had been overwhelmed by an official-led process that dominated the identification of policy priorities, which is a considerable derail from the original design intended for a member-driven process advanced by political will of respective forum members [13]. Therefore, a politically-driven decision making process is mandated in this new FPR process, which is inclusive in nature and able to accommodate decisions for cross-cutting issues having salience upon the region. This thus leads to greater responsibilities being delegated to Ministers and regional organisations, particularly regarding sector-specific decisions.

The inclusiveness of the FPR is further demonstrated in the accessibility of civil society actors which can engage in the decision-making process underpinned by the Forum members' political will, by submitting briefs identifying issues worth of further consideration. With such, civil society actors could help in the setting and shaping the Pacific Form Leaders' agenda, by providing advisory opinions in due occasions.



Daunting challenges exist, though, in supporting and maintaining the regional institutions of ocean policy-making and management delineated above. Considering most of the members are developing countries, these challenges have amplifying effects, should they intermingle with structural dysfunction and capacity deficiency, such as ownership competition and externality issues.

Listing below are exemplarily challenging issues [14]:

- Lack of funding – developing countries have limited funding to support all the regional institutions they are members of;
- Lack of capacity – developing countries have limited capacity to manage their own national administrations in addition to the regional bureaucracies;
- Question of developing country's policy-making autonomy in marine affairs – due to the aforementioned limitations, some developing countries struggle with autonomy of policy-making in marine affairs, to which regional organisations serve an advisory, yet intervening role;
- Externalities – regional organisations comprise of different memberships, often including members that are also development partners, which are often better resourced to participate and contribute to such regional meetings.

### Issues for Future Regional Ocean Governance

For Pacific Island countries, challenges to regional ocean governance persist, particularly in common issues, including unsustainable use of fisheries, habitat degradation, pollution of coastal waters from land-based as well ocean-based sources, waste management, climate change, sea level rise and threats due to invasive species [3]. While the PIROF-ISA is well-intentioned to address the constraints in framing national priorities in policy-making and coordination, issues of effective implementation have remained, particularly in sub-sectorial levels. To this, Manoa and Veitayaki's explanation is of weighing referential value, "the majority of nations are characterized by tiny administrations with severe technical and financial constraints. The coordination among relevant national bodies is in most instances poor, and with each national agency focusing only on its area of jurisdiction and on the implementation of its governing laws, integration and the sharing of responsibilities is difficult [8]."

Therefore, usual difficulties inhered in forming and refining integrated policy approaches experienced elsewhere have been accentuated in the Pacific Islands countries, mostly developing ones, due to their exceptionally high dependence on external support. A regional contextualization and analysis of progress to realise regional objectives may pave a way forward that can effectively integrates action plans, its implementation and practical application, by providing an alternative proposal to this capacity constraint, which include, but not limit to the following constituent steps: an assessment of links between sectors and impacts, clarification of the roles and responsibilities of governments, clarification of the rights and responsibilities of communities, and improved coordination between knowledge holders and decision makers.

That said, development of regional ocean governance in the Pacific Islands area sheds critical light on ocean management in other areas as well as the global region. The community wellbeing can be most effectively achieved through cooperation and collaboration between regional members, their experience sharing and piggybacking of national laws and policies, which could also alleviate pressures of financial constraints and bureaucratic incapacity suffered by most island countries.



## References

- [1] Marine Sector Working Group (MSWG) (1999). Pacific Islands Regional Ocean Policy (PIROP). <http://www.spc.int> (Feb. 20, 2023)
- [2] Haward, M. G. and Vince, J. Z. (2008). *Oceans Governance in the Twenty-first Century: Managing the Blue Planet* (Cheltenham, UK; Northampton, MA: Edward Elgar), cited in Vince, J., Brierley, E., Stevenson, S. and Dunstan, P. (2017). Ocean governance in the South Pacific region: Progress and plans for action. *Marine Policy* 79: 40-45.
- [3] Cordonnery, L. (2005). Implementing the Pacific Islands Regional Ocean policy: How Difficult Is It Going To Be?. *Victoria University of Wellington Law Review* 36(4):723-732; Manoa, P. E. and Veitayaki, J. (2009). Regional Ocean Governance in The Pacific Revisited. *Ocean Yearbook* 23(1): 503-520.
- [4] Supra. note 1. MSWG (1999). 5-7.
- [5] Council of Regional Organisations in the Pacific (2004). The Pacific Islands Regional Ocean Forum's Framework for Integrated Strategic Action (PIROF-ISA). <http://www.forumsec.org/pages.cfm/strategic-partnership.s-coor-dination/pacific-oceanscape/pacific-oceanscape-framework.html> (Feb. 20, 2023)
- [6] United Nations Division for Ocean Affairs and the Law of the Sea (Dec. 10, 1982) United Nations Convention on the Law of the Sea. [https://www.un.org/depts/los/convention\\_agreements/texts/unclos/UNCLOS-TOC.htm](https://www.un.org/depts/los/convention_agreements/texts/unclos/UNCLOS-TOC.htm) (Feb. 20, 2023)
- [7] Supra note 1. MSWG (1999). 4.
- [8] Supra note 3. Manoa and Veitayaki (2009).
- [9] Supra note 2. Vince, Brierley, Stevenson, and Dunstan (2017). 41.
- [10] Cristelle, P. and Govan, H. (2010). Our sea of islands, our livelihoods, our Oceania. Framework for a Pacific Oceanscape: A catalyst for implementation of ocean policy. <https://www.forumsec.org/wp-content/uploads/2018/03/Framework-for-a-Pacific-Oceanscape-2010.pdf> (Feb. 20, 2023)
- [11] Pacific Islands Forum (PIF) (2014). The Framework for Pacific Regionalism. PIF Secretariat. Suva, Fiji. The vision of the Framework for Pacific Regionalism is for a region of peace, harmony, security, social inclusion, and prosperity, so that all Pacific people can lead free, healthy, and productive lives.
- [12] Pacific Islands Forum (PIF) (2006). The Pacific Plan for Strengthening Regional Cooperation and Integration, PIF Secretariat. Suva, Fiji.
- [13] Pacific Plan Review 2013: Report to Pacific Leaders. (2013). Pacific Islands Forum Secretariat. Suva, Fiji. [https://www.forumsec.org/wp-content/uploads/2019/03/Pac-Plan-Review-Rpt-2013-Vol1\\_final.pdf](https://www.forumsec.org/wp-content/uploads/2019/03/Pac-Plan-Review-Rpt-2013-Vol1_final.pdf) (Feb. 20, 2023)
- [14] Supra note 2. Vince, Brierley, Stevenson, and Dunstan (2017). 42.



International Ocean Information

# 國際海洋資訊

# 23

雙月刊 | Bimonthly

發行：海洋委員會

地址：806610高雄市前鎮區成功二路25號4樓

電話：(07)3381810

E-mail：master@oac.gov.tw

網址：https://www.oac.gov.tw/

執行：財團法人台灣經濟研究院

地址：104222臺北市中山區德惠街16-8號7樓

電話：(02)2586-5000分機888

傳真：(02)2595-7131

網址：http://www.tier.org.tw/

發行人：管碧玲

副發行人：洪文玲、周美伍、吳美紅

總編輯：劉國列

編輯委員：黃向文、陳建宏、謝亞杰、

沈建中、許啓業、王茂城、

黃世偉、林麗英、李子嘉、

陳致延、蔡佩娟

編輯顧問：李明安、林宗儀

執行主編：鍾嘉雯、陳璋玲

執行編輯：黃釋緯、涂凱柔、謝惠子

美編設計：不賴的廣告

電話：(02)2783-3033

傳真：(02)2783-0978

Published by Ocean Affairs Council

Address：4F., No. 25, Chenggong 2nd Road,  
Qianzhen District, Kaohsiung City 806610,  
Taiwan

Telephone：(07)3381810

E-mail：master@oac.gov.tw

Website：https://www.oac.gov.tw/

Executive：Taiwan Institute of Economic Research

Address：7F., No. 16-8, Dehuei St., Jhongshan District,  
Taipei City 104222, Taiwan

Telephone：(02)2586-5000 Ext.888

Fax：(02)2595-7131

Website：http://www.tier.org.tw/

Publisher：Bi-Ling Kuan

Vice Publisher: Wen-Ling Hong, Mei-Wu Chou, Mei-Hung Wu

Editor-in-Chief：Kuo-Lieh Liu

Editorial Board：Hsiang-Wen Huang, Jiahn-Horng Chen,

Ya-Chieh Hsieh, Chien-Chung Shen,

Chad C.Y. Hsu, Mao-Chen Wang,

Shin-Wei Huang, Li-Ying Lin,

Zi-Jia Li, Chih-Yen Chen, Pei-Chuan Tsai

Reviewer：Ming-An Lee, Tsung-Yi Lin

Managing Editor：Chia-Wen Chung, Chung-Ling Chen

Executive Editor：Shi-Wei Huang, Kai-Jou Tu, Hui-Tzu Hsieh

Designed by Pride Advertising Agency Ltd.

Telephone：(02)2783-0978

Fax：(02)2783-3033

讀者意見回饋，請來電(02)2586-5000分機888或E-mail至d11743@tier.org.tw



# 國際海洋資訊

雙月刊 | Bimonthly 23 April 2023



封面／吐瓦魯國由9個島礁群組成，最高處不超出海平面4公尺，因此極度關切海平面上升、氣候變遷議題

封底／2022年「太平洋藍碳高峰會」合影

中華民國112年4月出版（每雙月出版）

中華民國108年8月創刊

ISSN 2706-638X（紙本）

ISSN 2706-6398（電子）

中華郵政高雄雜字第236號執照登記為雜誌交寄

著作權所有未經同意不得轉載



海洋委員會  
Ocean Affairs Council 發行



台灣經濟研究院  
Taiwan Institute of Economic Research 編印

贈閱



線上全文