

Review

Contribution of an Integrated Maritime Policy to the Dialogue of Civilisations: The Asia-Pacific Case

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Abstract: Sustainable development of marine resources requires a robust national coastal and ocean policy and harmonization of environmental management systems in areas of overlapping interests among nations. This is becoming increasingly important in the efforts of governments worldwide. Critical issues related to the exploitation of natural resources and the degradation of marine ecosystems, coupled with global crosscutting environmental issues such as climate change and climate-related hazards, require forging cross-border cooperation and international consensus on ensuring ecosystem-based approach principles in marine management and maritime domain awareness and security as reflected in the U.N.'s Sustainable Development Goals. Increasing the scale of marine planning processes entails increased cooperation on humankind's shared endowment of global oceans and interconnected marine systems. As a result, interactions across the world are multiplying, which intensifies the dialogue of civilisations. The following exploration of a roadmap for developing an Integrated Marine/Maritime Policy in the Asia-Pacific region reveals enhanced opportunities for maintaining environmental integrity and sustainability in transboundary areas while considering local, regional, and global socio-economic and environmental challenges. This is a science-policy analysis of the marine-related practices of the region under consideration. The key here is to improve environmental safety and strengthen global security because of coherent actions jointly adopted in a setting of mutual respect and unity by a shared purpose to create reliable foundations for sustainable development in the Asia-Pacific region.

Keywords: sustainable development; marine policy; ecosystem-based marine management; climate change; the Asia-Pacific region; marine environmental strategy



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1. Introduction

The cornerstone of Ecosystem-Based Marine Management (EBMM) is establishing an effective management system to ensure that marine space uses do not exceed its ecological carrying capacity. Striking a balance between socio-economic development and the conservation of natural resources requires an effective governance system that fosters sustainable development and human wellbeing according to common guiding principles of environmental integrity. The role of EBMM has been expanding through pilot projects and official program implementation, often in conjunction with the development of Integrated Coastal and Ocean Management (ICOM) (The IOC of UNESCO characterizes ICOM as a “dynamic, multidisciplinary, iterative and participatory process to promote sustainable management of coastal and ocean areas balancing environmental, economic, social, cultural and recreational objectives over the long-term. ICOM entails the integration of all relevant

policy areas, sectors, and levels of administration. It means integration of the terrestrial and marine components of the target territory, in both time and space. ICOM, therefore, is an approach to manage not only coastal areas but exclusive economic zones and large marine ecosystems, serving the purposes of national ocean policies" ([1], p. iv)) and Marine Spatial Planning (MSP) (The IOC of UNESCO describes MSP as a "public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that are usually specified through a political process" ([2], p.x.)), and other ecosystem-based approaches [3], which coastal nations have used to improve the management of the coastal and marine areas. It has been projected [4] that by 2030, marine spatial plans could cover 50 percent of all marine areas encompassed in exclusive economic zones.

Capacity development to promote EBMM has relied on the guidelines and methodologies designed, primarily through U.N. agencies, multi-national cooperative organizations, national governments, and non-governmental organizations. The results include a growing agreement on general principles underlying EBMM [1,2,5–9], a shared recognition of ecosystem health challenges [10,11], and recommended processes for improving the sustainable development of coastal and marine ecosystems and strengthening marine resource-dependent economies [12]. However, EBMM implementation is not uniform but reflects marine ecosystems' local characteristics and differing administrative, ecological, and geopolitical frameworks [13–15]. This paper highlights commonalities and differences in perspectives regarding EBMM in the Asia-Pacific region. It explores the advantages of and challenges to developing an Integrated Marine/Maritime Policy (IMP) in the Asia-Pacific region as an *indispensable contribution to the dialogue of civilisations leading toward a safer world*. While acknowledging that "problems of ocean space are closely interrelated and need to be considered as a whole" ([16], p. 25) and recognizing the need to overcome the threats to marine ecosystems in areas beyond national jurisdiction [17,18], this study focuses on the integrative function of the ecosystem-based approaches [19] as mechanisms to promote transnational unity on sustainable development issues of the Asia-Pacific region.

This paper examines these issues through the lens of the United Nations Decade of Ocean Science for Sustainable Development (2021–2030), such as the development of sustainable knowledge-based ocean economies, the adverse impact of multiple stressors on ocean ecosystems, the need to develop better forecasting tools to anticipate changing ocean conditions and their likely impact on human wellbeing and livelihoods. This review also provides a basis for considering possible science-policy interactions in the design and implementation of EBMM to reduce the potential for conflict. This paper expands the philosophical and scientific vision of the development potential of IMP in the Asia-Pacific region, with attention to modern climate change-related issues. After beginning with an overview of global trends in the adoption of EBMM, this paper explores the potential of using an EBMM approach at a transnational scale in the Asia-Pacific region under the *Asia-Pacific Marine Environmental Strategy* framework, which results in searching for more environment-friendly policies and decisions.

2. Materials and Methods

Conventions, resolutions, and technical publications of the U.N. organization and other national and international organizations serves as the source of information on the present state of guidance and implementation on Integrated Coastal Zone Management, Marine Spatial Planning, Ecosystem-Based Management, and conflict avoidance and resolution. Which, in turn provides a foundation for the ideas developed in this paper. This information has helped structure and populate the conceptual models explored using system analysis tools and strategic and analytical forecasting methods (Figure 1). This comprehensive approach provided a general framework for the subsequent analytical focus on the Asia-Pacific region. The left-hand column in Figure 1 represents information used to structure and populate the conceptual models and represented in the central column

of Figure 1. The goals represented in the conceptual model of EBMM in the Asia-Pacific region are listed in the right-hand column of Figure 1.

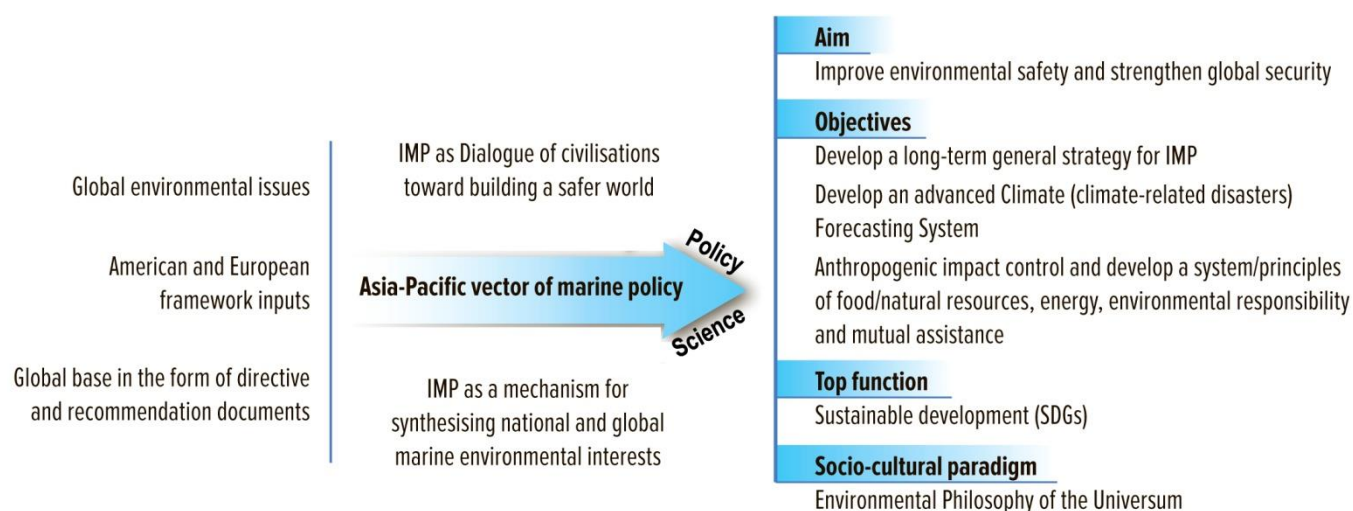


Figure 1. A visual representation of the conceptual model used to apply global experience with Integrated Marine Policy (IMP) to the Asia-Pacific region.

In selecting studies to be included in this synthesis, a systematic and comprehensive review of the relevant literature and materials was performed according to the following parameters (see Appendix A, category numbers in order of listing).

- Studies with direct relevance to the development of the concept of ecosystem approaches to the management of ocean-related activities, i.e., those providing guidelines and practical recommendations on the implementation and progress of integrated coastal and marine management and planning. Overall, these studies give a good view of the function, tools and methods of ecosystem approaches and provide a sound common understanding of what is needed for their development (category 1).
- Studies examining expertise and practices in the field of marine resource and environmental management worldwide. This review indicates the many areas with coastline all over the world. The common country assessment identifies key issues effecting the implementation, progress, and outcomes of ecosystem approaches. One of the realities that have emerged from such a comparative study of international experience is the understanding of the overall status of EBMM, ICOM, MSP implementation, including American and European framework inputs in addressing those issues, and of which additional measures can and should be taken to achieve the sustainable development in the Asia-Pacific region and globally (category 2).
- The original sources containing a legal and institutional framework and strategies on marine and environmental management. Those documents provide a sound basis to articulate important variables relevant to the research and to gain a possible perspective in the area under study (category 3).
- Primary reports and reviews dealing with current issues. They verify information we operate and give us an indication of how the research questions worked (category 4).
- Studies focusing on climate and environmental-related challenges that is this generation's defining task. This category spans a broad range interlinking aspects of the subject under consideration, including some that have enormous environmental and political implications. The insights gained from in-depth review of these studies underscore the crucial current and potential challenges throughout the Asia-Pacific region. Such review is carried out within the context of sustainable marine development, leading to a way that permits a new perspective (category 5).
- Empirical studies from different methodological traditions, including experimental studies, descriptive statistics, and large-scale achievement data. This information is

mainly used for the tabular and graphic presentation of characteristics of issues under research (category 6).

Within these parameters, specific data and relevant materials were selected from various credible sources in sufficient quantities for review process. According to the review strategy, focused analysis was undertaken to determine the specific important variables and phenomena followed by structuring and synthesizing the findings within a logical research system. Building on the results gathered, environmental challenges and political capacity in the area of ocean affairs were subsequently undertaken for Asia-Pacific region and further marine policy development and integrated ocean management were promoted through a marine environmental strategy that provides additional opportunities.

3. Results

3.1. *Progressive Uptake of Ecosystem-Based Marine Management*

The efficacy of Ecosystem-Based Management (EBM) is contingent on the feasibility and clarity of the objectives and the long-term commitment of scientific and fiscal resources necessary to its successful implementation. These include environmental protection activities, effective communication with marine industries, protection of historical and cultural heritage, judicious management of fishing, aquaculture, tourism, and recreation activities, consideration of food, energy, and border security, international cooperation and collaboration, etc.

The ecosystem approach to marine management relies on informational, participatory, and managerial pillars [20]. These pillars represent knowledge systems, management systems, and stakeholder engagement processes, including environmental and resources management, sustainable fisheries, economic development, biodiversity conservation, habitat protection and restoration, water conservation, pollution reduction and waste management, risk management, climate change adaptation, and adaptive management [2,7,21]. Methods to integrate these pillars are steadily improving as practitioners learn from practical experience in different countries [22–25] and in areas beyond national jurisdiction [26,27].

Differences in implementing ecosystem-based approaches to marine management and MSP reveal their flexibility and adaptability to specific circumstances [28]. Conditions that engender a need for local adaptation of the EBM approach include differences in geographic location, demographic and socio-economic conditions, ecological circumstances; governance structures and policies; available financial, human, technical, scientific resources; major issues, strengths, weaknesses, opportunities and threats; multijurisdictional requirements, and potential areas of convergence and cooperation—including international issues. Consequently, it is useful to begin this review with a bit of history, a little geography, and some politics as a backdrop to marine management issues.

Australia's pioneering experience with the management of Large Marine Protected Areas casts a revealing light on MSP implementation. Zoning of Great Barrier Reef Marine National Park in the late 1970s [29] is considered the beginning of MSP globally, contributing to global efforts in line with marine use sustainability. Today, the zoning of maritime activities is one of the critical methods of world MSP practice.

In the U.S., with its extensive coastline and large Exclusive Economic Zone (EEZ), three critical pieces of legislation have served to advance the development of an ecosystem-based focus on evaluating activities that could impinge on the natural environment. Together, these laws have supported an ever-increasing movement toward adopting the EBM paradigm across ocean sectors. Among these, the National Environmental Policy Act (1969), the Coastal Zone Management Act (1972), and the Fisheries Conservation and Management Act (1976) and subsequent amendments to those Acts have required the formal assessment of the environmental impacts of activities proposed in the marine environment. The U.S. Congress and U.S. Federal Court System have increasingly pushed the rules guiding environmental assessments to address cumulative and programmatic impacts and adopt an ecosystem perspective in the decision-making process [22]. The U.S. National Commission on Ocean Policy has championed the application of EBM in

U.S. federal waters. In this regard, the Commission has formulated numerous recommendations for a new and comprehensive national ocean policy necessary to ensure the success of the process [30]. Similarly, the U.S. National Ocean Council has promoted the implementation of coastal and marine planning since 2010, following the presidential order “Stewardship of the Ocean, Our Coasts, and the Great Lakes” established requirements for the environmental management and preservation [31]. Nevertheless, this order was revoked by a new executive order “Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States” (2018) that does not contain the same environmental protections and enhances a policy of using ocean, coastal, and Great Lakes waters for energy production, industrial development and protection of U.S. national interests in the ocean and along the Nation’s coasts [32]. In nearshore waters, where individual states have management authority, the Coastal Zone Management Act establishes a framework for coastal and marine management and provides some federal support (financial and scientific) through the U.S. National Oceanic and Atmospheric Administration. As the lead agency for implementing the Fisheries Conservation and Management Act, the U.S. National Oceanic and Atmospheric Administration has developed guidelines for an ecosystem approach to fisheries management, the development of ecosystem-based fishery management plans, and supports much of the science and data available for integrated management and marine planning.

In Canada, the Oceans Act (1996) [33] and related legislation have adopted an EBM perspective for the large ocean management areas abutting Canada’s Atlantic, Pacific, and Arctic coasts. A risk assessment and risk management framework guide the scientific advisory process of the EBM system to inform ecosystem priorities and identify vulnerabilities addressed in the regulation and planning processes [20,22]. The principal features of marine planning in Canada and the U.S. can be characterized as identifying large-scale ecoregions based on physical-geographical zoning.

As reviews of national experiences with marine management have shown, the successful development of EBMM may require the improvement of policy instruments and revision of enabling legislation [34–36]. Over the past 30 years, the European Union has developed environmental legislation, including legislation focused on coastal and marine area management. Many of the MSP research projects and pilot studies to date were funded by the European Union. In the E.U., EBMM is methodically focused on integrating user functions and based on an analysis of economic policy [37], including opportunities for the growth of maritime economic activities for achieving more comprehensive IMP and societal aims within the E.U. Ocean Economy strategy [38]. EBM measures provide the tools and frameworks to achieve Good Environmental Status [39] for Europe’s regional seas [40]. It is typical for MSP boundaries to correspond with the administrative maritime boundaries of the Member States. To drive the sustainable development of coastal and marine areas through EBM implementation, the European Commission has enshrined several conventions and international agreements.

The Mediterranean Action Plan’s adoption in 1975 under the United Nations Environment Program’s auspices has been the earliest E.U. significant policy step that addresses the need to protect the environment and build a shared understanding of sustainable development in the Mediterranean basin. In the same vein, the Protocol on Integrated Coastal Zone Management (2008) to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) (1976) is considered the first time Integrated Coastal Zone Management (ICZM) has been fully regulated by a legally binding international document [41].

The European Code of Conduct for Coastal Zones [42] emphasizes the importance of harmonizing coastal states’ interests through international agreements. Similarly, the U.N. Convention on Environmental Impact Assessment in a Trans-boundary Context and its complementary Protocol on strategic environmental assessment call for ex-ante assessments of the environmental impact of projects that could adversely impact coastal zones and that the assessments be conducted both within the state and for neighboring countries that might

be adversely impacted. Active work on developing Europe's ICZM and MSP system began shortly after the E.U. Council Directive Concerning Integrated Pollution Prevention and Control (1996) was adopted [43]. With addition impetus for MSP following the adoption of the Marine Strategy Framework Directive (2008) [40] and the Directive on Marine Spatial Planning (2014) [44]. The latter obliges coastal E.U. Member States to develop MSPs that are coherent across borders by 2021. The development of these directives benefited from lessons learned in the conceptualization, negotiation, and adoption of the Vision and Strategies for the Baltic Sea Region (VASAB) in 1992 [45]. VASAB reflects multilateral intergovernmental cooperation among the ten Baltic Sea Region nations to devise a shared strategy for spatial planning and sustainable development. From the perspective of integrative principles, the Long-Term Perspective for the Territorial Development of the Baltic Sea Region included in VASAB highlights the Baltic Sea Region states' transnational actions to promote joint sustainable development [15]. In the Roadmap on Maritime Spatial Planning (2008), the European Commission defines MSP principles, including coherence between terrestrial spatial planning and coastal and marine management [46].

The E.U. funds environmental action through the LIFE project (1992), which promotes implementation and integration of E.U. environment and climate policy. The LIFE project budget for 2014–2020, EUR 3.4 billion, currently includes support for the development and implementation of about 20 regional ICZM projects [47]. It is anticipated that sustained financing of the LIFE project, coupled with growing consideration of environmental and climate targets in legislation and policies, will support additional ICZM projects with positive cost-benefit ratios in line with current ICZM projects. Further evolution of MSP in the E.U. will likely overlap strongly with crosscutting policies, including Blue Growth. Blue Growth has a strategic focus on advocating for innovation in the maritime economy and emerged as a response to the 2010 economic crisis, which highlighted the vulnerability of traditional extraction-based economic sectors. The E.U. Blue Economy Report (2020) encourages sea basin-scale strategies and MSP to ensure tailor-made measures and foster cooperation between countries. It emphasizes that knowledge, legal certainty, and security are preconditions for Blue Growth. Thus, going forward, European maritime policy will move toward an integrated consideration of economic, socio-political, and environmental issues, with MSP serving as a powerful instrument that decision-makers wield to stimulate growth of the Blue Economy.

Building on global experience in the sphere of marine management, the UNESCO Intergovernmental Oceanographic Commission has identified problem areas and best practices for the development of ICOM and MSP and the successful application of EBMM. The IOC-UNESCO has continuously enhanced its EBMM platform, which includes marine data and guidance to support and accelerate marine planning processes worldwide [48].

Concerns about food security and the exponentially increasing environmental problems in many coastal regions contribute to the growing interest in an ecosystem-based approach. Pollution and degradation of coastal ecosystems are severe problems in many countries. These concerns are especially applicable to East Asia, where approximately 2 billion people, over one-quarter of the earth's population, border the seas [7].

While the nations that share marine areas in the Asia-Pacific region differ in their particular concerns and approaches to coastal and marine resource management, they share many of the same concerns. The following section goes deeper into exploration of the applicability of EBMM in the Asia-Pacific region and the need to strive for an integrated multilateral transnational cooperation to address marine and climate-related challenges.

3.2. The Asia-Pacific Vector of Ecosystem-Based Marine Management

This brief overview of the development and application of EBMM sets the stage for the exploration of opportunities for and impediments to developing a general environmental strategy for IMP in the Asia-Pacific region. The interpenetration of the marine environmental and political issues and current regional environment-oriented activities are good reasons to craft a set of mutually beneficial multilateral policy guidelines for

sustainable development and the protection of marine ecosystems in the region. This conceptual exploration of global and region-scale environmental aspects in the Asia-Pacific region serves to identify multiple categories of the issues that bring civilisations ever closer to each other and require ecological-friendly political decisions to achieve environmental security as a reliable foundation to address the global challenges facing present and future generations. The essential points have been covered in this analytical cross-section.

3.2.1. Regional Diversity in Marine Policy

Rising awareness of the global ocean is important to the sustainable development of the Asia-Pacific region (this paper addressed the Asia-Pacific as region, which includes countries arranged over the perimeter of the Pacific Ocean and numerous small-island States in the ocean), where over 60 percent of the world's population lives [49]. This region, which borders the Pacific Basin, the South China Sea, and the Indian Ocean, presents a wealth of natural and environmental, economic, and cultural diversity [50]. The terrestrial and marine ecosystems in the Asia-Pacific region include tropical, temperate, subarctic, and arctic climate zones. Its diversity of marine ecosystems and the unparalleled magnitude of their biological resources provide a natural setting for exploring a framework for the transnational collaboration toward developing an integrated approach to EBMM that strives to maintain ecological balance while promoting sustainable development across the region (Figure 2 and Table 1).

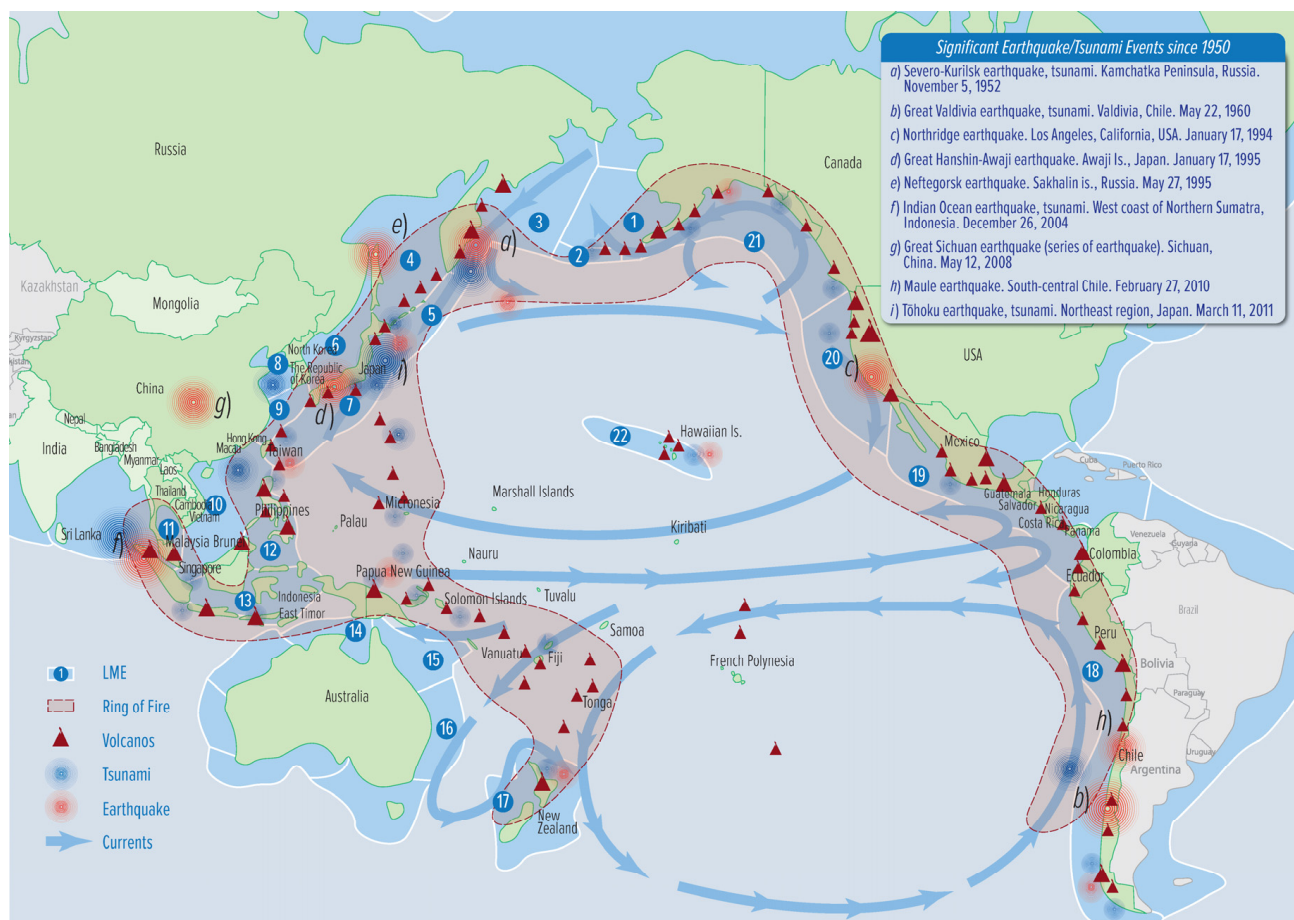


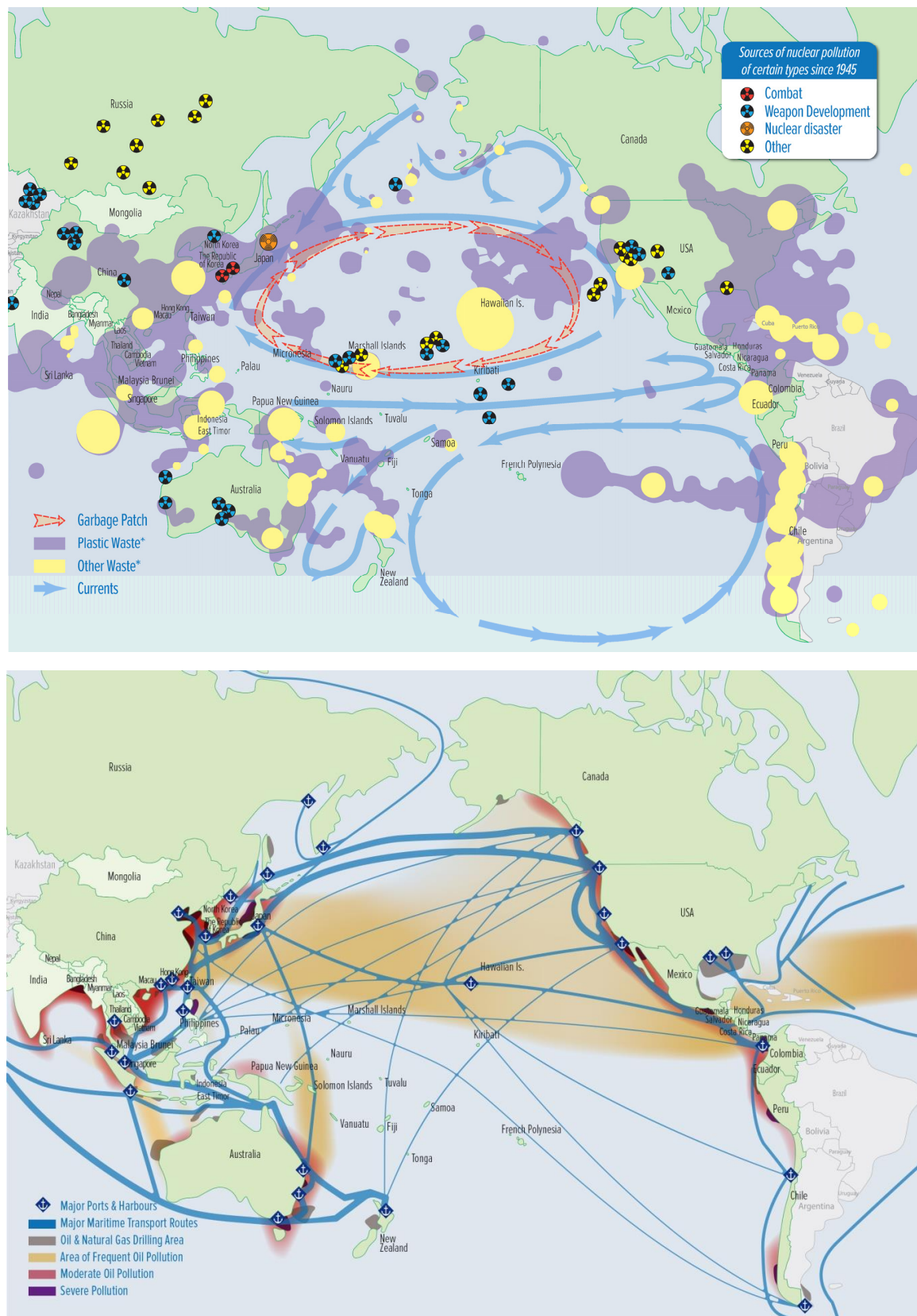
Figure 2. Natural synergy of the Asia-Pacific region (sources of data used: [51–55]).

Table 1. Large marine ecosystems of the Asia-Pacific region (source of data used: [51]).

N (See Figure 1)	LME NAME	Area, km ²	Area Covered by Marine Protected Areas, Percent	Coastal Population, Persons	Ocean Health Index (OHI) *	LME Risk Score **
1	East Bering Sea	1,193,601	14.33	33,447	68.84	0.023
2	Aleutian Islands	1,244,883	46.66	287	68.94	0.019
3	West Bering Sea	2,182,768	2.53	310,725	66.64	0.098
4	Sea of Okhotsk	1,627,284	1.59	1,624,225	66.47	0.071
5	Oyashio Current	663,609	3.20	999,018	66.45	0.043
6	Sea of Japan	1,054,305	10.32	73,156,955	65.10	0.051
7	Kuroshio Current	1,333,074	5.60	111,318,152	65.82	0.058
8	Yellow Sea	438,619	1.45	170,223,678	63.9	0.188
9	East China Sea	1,008,066	10.82	136,598,017	64.23	0.218
10	South China Sea	5,662,985	2.08	271,695,309	60.4	0.216
11	Gulf of Thailand	391,665	0.58	38,106,496	64.89	0.214
12	Sulu-Celebes Sea	1,015,737	2.37	82,399,159	60.13	0.227
13	Indonesian Sea	2,289,597	3.46	172,293,928	61.75	0.19
14	North Australian Shelf	772,214	20.90	151,278	75.82	0.004
15	Northeast Australian Shelf	1,299,112	97.76	864,131	75.79	0.022
16	East Central Australian Shelf	660,679	38.89	9,124,731	75.81	0.004
17	New Zealand Shelf	980,420	7.06	4,276,380	77.61	0.019
18	Humboldt Current	2,619,386	0.14	30,444,488	63.22	0.108
19	Pacific Central-American Coastal	1,996,659	1.81	50,320,369	59.14	0.147
20	California Current	2,224,665	2.44	39,398,712	65.01	0.031
21	Gulf of Alaska	1,491,252	33.12	8,473,872	69.36	0.027
22	Insular Pacific-Hawaiian	975,493	67.88	1,367,394	68.94	0.021

Notes [51]: * “The Ocean Health Index (OHI) defines a healthy ocean as one that sustainably delivers a range of benefits to people now and in the future, such as the provision of food (through fisheries and mariculture) and natural products, coastal protection, carbon storage, livelihoods and economies, tourism, and biodiversity. The scores were assessed in 2016 to measure the status and likely state of these benefits for each LME, on a scale from 0 to 100”. ** “The LME Risk Score is an indicator of the probability of adverse consequences for humans and the environment in relation to the changing states of transboundary waters. The assessment was done in 2016, based on numerous indicators under each of the five LME modules (Productivity, Fish & Fisheries, Pollution & Ecosystem Health, Socioeconomics, and Governance)”.

There are, however, critical challenges to developing and implementing an overarching integrated EBMM in the Asia-Pacific region (Figures 2 and 3a,b). These include extensive pollution and habitat degradation in some portions of the region, unsustainable use of coastal and marine areas in other portions of the region, divergent social-economic systems, a lack of coherence in legal foundations and philosophies, conflicting regulatory capacity and policies, and weak institutional partnerships. Some of these issues are evident only in certain countries—others being regional in scope. Crosscutting issues include climate change and related natural hazards that affect every nation’s economic and environmental conditions, albeit unevenly. Given different political systems and various levels of economic growth, there is considerable variation in coastal and marine management among the countries in the region.



(b)

Figure 3. Human activities affect the environment by contributing to the pollution *. (a) Waste pollution [56], nuclear pollution [57,58], garbage patch [59]. (b) Shipping and oil pollutions [60–65].

Notes: * Pollution is shown for the Asia-Pacific region and the surrounding land and marine areas according available data [56–65]. The Figure does not purport to be complete but shows a general trend.

Globalization and geopolitical issues underlie the history and practices of marine management in the Asia-Pacific region [66]. The United Nations Environment Program Regional Seas Programme (1974) set the stage for expanded maritime regionalism by urging neighboring countries to organize sustainable coastal and marine management in an integrative manner [67]. The Regional Seas Programme comprises several significant projects around the world, including the Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP). The People's Republic of China, Japan, the Republic of Korea, and the Russian Federation adopted NOWPAP in September 1994 [68]. NOWPAP and similar programmes encourage a multilateral approach to EBM and support for international policy instruments that articulate coastal and marine policies intended to ensure sustainable development. Notable conventions and international agreements include the U.N. Convention on the Law of the Sea, U.N. Agenda 21, the U.N. Framework Convention on Climate Change, and the U.N. Convention on Biological Diversity. However, applying these conventions and agreeing to specific management approaches and policies is challenging in the Asia-Pacific and similar regions with diverse social, legal, political, and economic systems.

Southeast Asia began to explore EBMM in 1985 with national subprojects for coastal resources management in Singapore, Thailand, the Philippines, Indonesia, Malaysia, and Brunei Darussalam. Projects developed with support from the U.S. Agency for International Development [7]. In 2003, the 12 Asian nations adopted the Sustainable Development Strategy for the Sea of East Asia (SDS-SEA), a multilateral initiative inspired by U.N. Agenda 21 and other international environmental instruments [69]. Together, East and Southeast Asian nations generate approximately 76% of world aquaculture fish production, 58% of which comes from China [70]. Consequently, these nations recognize a shared interest in environmental sustainability. The East Asia programs on integrated coastal planning and management focus on the multiple regional challenges that speed up, revitalize, and expand sustainable development partnerships to explore areas of common interest such as protecting the marine environment, development of coherent strategies for MSP, preventing and reducing land- and sea-based pollution, fostering sustainable fisheries, conserving biodiversity, and reducing the adverse effects of multiple stressors, such as climate change. However, harmful algal blooms, microplastics, and marine debris continue to be pressing environmental problems in the region.

It is instructive to consider regional EBMM development in the context of NOWPAP and Partnerships in Environmental Management for the Seas of East Asia (PEMSEA). The integrated marine management developed by the PEMSEA is particularly instructive. Since 1999, through encouragement and support from PEMSEA, many East Asian nations have developed and successfully implemented ICZM [69,71]. NOWPAP objectives aimed at fostering the development of a cohesive multilateral environmental approach [72] for coastal waters of the Northwest Pacific and its bordering seas have been directed at pollution problems such as the unintentional release of debris into the aquatic ecosystems, the dumping of solid waste, and preventing overfishing and rebuilding overfished stocks, preventing and mitigating habitat degradation, mitigating the impacts of Harmful Algal Blooms, e.g., “red tides”, and encouraging international cooperative decision-making on transnational issues, such as those that have arisen from development in the Tumen River basin [73].

Over the past 20 years, several Asia-Pacific nations have achieved significant progress in EBM. In most instances, the progress has benefited from legislation that established national objectives for coastal and marine policy and provided the legal instruments and regulations needed to carry out ecosystem-based approaches. Some countries, such as the USA, have a long tradition in integrated management and marine planning while others, such as the Republic of Indonesia, have made considerable efforts to implement it more

recently. China's intensive efforts in MSP have been particularly successful [71]. In China, the national economic and social development plans incorporate the plans for environmental protection. The Environmental Protection Law (1989) and subsequent amendments to this Law have shaped the main framework for environmental-related legislation [74]. Similarly, the Marine Environmental Protection Law (1999) promotes the development of marine programs and sustainable economic and social development and provides specific guidelines in protecting the marine environment and resources [75]. In 2001, the Sea Area Use Management Law was enacted. This Law established basic principles for marine resource management, marine development planning, and the establishment of marine nature reserves in China [76]. Marine resource use is governed under a system of marine functional zones approved by national authorities based on criteria that consider economic and environmental values and require payment for economic use of coastal and marine areas [77]. China has focused on monitoring marine environmental quality, controlling land-based pollution sources, reducing pollution from sea-based activities, restoring marine ecosystems, and preventing environmental risks. Preventing pollution of the Yellow Sea is a particular priority. While China seeks to address pollution and risks to biological diversity within complete marine basins and watersheds, some regions, such as the Bohai Sea, continue to suffer from critical environmental degradation [78,79]. In the meantime, China is actively pursuing diplomacy aimed at expanding international cooperation on MSP issues.

Japan has enacted a comprehensive array of environmental policies to address pollution problems and other environmental issues associated with industrialization. It has coupled an approach that empowers local engagement [80] with a national approach to total pollution control (TPLC) [81]. Japanese legislation on coastal and river basin management comprises basic laws and more issue-specific legislation related to protecting the environment. Among others, the Basic Law for Environmental Pollution Control (1967) has established a comprehensive pollution control policy [82] and the Water Pollution Control Law (1970) and subsequent amendments to this Law have provided several management measures to reduce the pollution of water [83]. Japan's "Strategy for a Sustainable Society" (2001) formulated the primary priorities for its sustainable development, including the creation of a Japanese model for environmentally oriented economic growth and the establishment of an international framework for the reduction of global greenhouse gas emissions to achieve the Kyoto Protocol targets—therefore addressing global environmental issues [84]. At present, Japan supports continuous efforts to implement EBM-related issues through scientific and technological achievements and to ensure recognition of Japan as a "Leading Environmental Nation" [84].

In the late 1990s, the Republic of Korea strengthened its own marine environment protection measures through amendments to the Prevention of Marine Pollution Act and enactment of the Coastal Management Act (1999) [14]. These legislative actions were precipitated by concerns related to the degradation of the coastal and marine environment; Korea's heavy dependence on fisheries for food security and employment, and Korea's prominent role in maritime shipping [85]. These concerns also led to improved management tools and the establishment of legal and institutional arrangements that support EBM and promote a comprehensive oceans policy. Among these, the Marine and Fisheries Development Basic Act (Korea Oceans Act) (2002) has strengthened an integrated ocean management system as a national priority [86]. Further integration of the institutional arrangements and policies is expected to lead to more efficient marine management. To support plan development, Korea has launched an initiative to identify high priority areas for environmental and socio-economic development while considering the limitations of land area, natural resources, and financial resources. From Korea's perspective, the most critical intersecting issues for marine management are food security and poverty alleviation, ecosystem health, preservation of cultural heritage, and reinforcement of Korea's maritime presence across the globe [87].

To date, marine activities in Russia, which has one of the largest EEZs, continue to be managed mostly through a sectoral approach implemented through federal ministries and agencies in charge of maritime affairs. Nevertheless, since the mid-1990s Russia has started to strengthen the capacity in the area of an EBMM through mainly the federal target programme “World Ocean” and international programmes on the Black, Baltic, Caspian, and Bering seas [88]. The Marine Doctrine of the Russian Federation [89] and the Strategy of Development of Maritime Activities of the Russian Federation till 2030 [90] have reinforced the principal framework underpinning Russia’s national maritime policy. These strategy documents, as well as developed methodological recommendations [91,92], enhance a policy for sustainable development of key maritime activities in the World Ocean, including the design and implementation of an integrated approach to coastal and marine management. Since the drafting national guidelines and proposals for governance and management of uses of marine resources, several pilot projects on ICZM and MSP have been carried out [35,36,88]. Among these is the development of an MSP for Russian portions of the Barents and Baltic Seas [93]. Russia is currently in the process of developing the Russian MSP Roadmap within the Capacity4MSP project platform [94]. It appears that progress in planning and management in the Russian national maritime policy will depend on success in addressing several interrelated internal policy issues such as determination federal executive body responsible for the integrated development and management of maritime activities; development of a regulatory legal framework for integrated planning and management of maritime use; clarification of competence of the federal center and coastal subjects of the Russian Federation in relation to the use of marine resources; establishing clear and transparent mechanisms for the distribution of marine resources [88].

As indicated above, there are substantial differences in the goals and tools available to support marine management among nations in the Asia-Pacific region. Consequently, thus far, domestic policy has mostly determined how EBMM has been applied in this region. The marine environmental decision-making process is further complicated for coordinating joint efforts within the framework of international marine-related issues. The long-term environmental prosperity would require civilisations dialogue across the breadth of the Pacific Ocean with a view to finding common ground and exploring a potential cooperation in the interest of the nations with varying capacities of economic and environmental functions.

3.2.2. The Intertwining of the Global Climate Effects

Although individual countries’ marine management efforts have improved both the natural and human dimensions, a unilateral approach cannot address global issues and challenges for the present or future; a new approach based on solidarity is needed. Present geopolitical, ecological, and economic conditions in the Asia-Pacific region suggest that Integrated Marine Policy could catalyze intraregional cooperation based on the synergy between science and policy actions combined with high-level diplomatic acumen.

Ensuring that strategies for sustainable development of coastal and marine ecosystems are embedded within regional economic development plans is complicated by global climate change issues, the current state of regional development, and regional and global geopolitics. The challenges of climate change and its security implications are increasingly global [95–97]. Already some significant world initiatives have been taken [98–100] to develop adaptation strategies to mitigate the adverse effects of climate change, particularly by the European Union [101,102]. These advances should be used as a stepping-stone to further develop multilateral approaches to climate change science and forecasting. Like those of managing shared watersheds, the challenges of climate change require multilateral diplomacy to coordinate different political and environmental efforts based on shared values.

The current generation is witness to global natural processes that include a long-term trend of climatic warming. According to the World Meteorological Organization,

the 20 warmest years on record since 1850 have taken place in the past 22 years (1997–2018) [103]. The long-term warming trend showed an average increase of 0.93 °C above the pre-industrial baseline for the decade 2009–2018 and an average increase of 1.04 °C above the pre-industrial baseline for the past five years, 2014–2018 [103,104]. With its latent heat capacity, the world ocean is an integral part of the global biosphere and plays a crucial role in climate stabilization. In addition, world ocean levels fluctuate because of thermal expansion or squeeze of ocean water, as well as glaciers and ice sheets that expand or decline. In response to the prevailing phase of warming, sea level has risen about 8–9 inches since 1880 [105]. In addition, climate change is expected to increase the frequency and severity of extreme weather events. Such climate-related natural disasters adversely impact natural and anthropogenic systems, affecting economic productivity, food security, and sustainability of living infrastructure, biodiversity, fisheries, and the traditional economic structure of coastal and marine areas. It is estimated that there has been an increase of 151% in direct economic losses from climate-related disasters from 1998 through 2017, including significant economic losses from disasters experienced by the USA (944.8 billion US\$), China (492.2 billion US\$), Japan (376.3 billion US\$), India (79.5 billion US\$), and Puerto Rico (71.7 billion US\$) [106].

The U.N. estimates that “more than 40 percent of internal armed conflicts over the last 60 years have been linked to natural resources” [107] and “with the increasing impacts of climate change evident in all regions, the risks are only going to grow” [107]. Additionally, the European Commission warns that “conflicts related to natural resources and/or environmental degradation are twice as likely to return to violence or become “re-wars” within five years. Since conflict and environmental degradation exacerbate each other, their spectrum and severity could expand unless they are addressed together, as a system” [108].

The Asia-Pacific region is geologically and meteorologically active. There are several hotspot clusters in the region [49]: the transboundary river basins; the Pacific small island developing States; the sand and dust storm risk corridors; and the Pacific Ring of Fire Figure 2. The latter stretches from New Zealand, through Indonesia, the Philippines, Japan, the Russia’s East coast, and the Pacific coasts of North and South America and is known for its extensive chain of active and dormant volcanoes (about 90% of the world’s total) and other tectonically active processes including damaging earthquakes (about 81% of the world’s total) [109]. According to the U.N. Economic and Social Commission for Asia and the Pacific, the Asia-Pacific Region is more affected by natural disasters than any other region in the world. As indicated, “since 1970, the number of people killed has fluctuated considerably from year to year but has averaged 43,000 annually, principally from earthquakes, storms, and floods. Beyond the fatalities, many more people have been affected; since 1970, a person living in the Asia-Pacific region has been five times more likely to be affected by natural disasters than a person living outside the region” ([110], p.vi). The U.N. International Organization for Migration expects that by 2050, climate change will lead to 25 million to 1 billion environmental migrants moving within their countries or across borders, on a permanent or temporary basis. Many of these environmental migrants will come from coastal populations [111]. Environmental migration is expected to heighten tensions and increase the risk of social conflict [111]. The European Commission notes, “the U.N. Security Council’s focus on the environment-security-development nexus is increasing, with several countries urging that climate change be addressed as a global security threat; issues are ranging from loss of livelihoods and illegal exploitation of minerals to the impacts of climate change on national sovereignty” [108]. Environmental disasters can place natural and human habitats under acute stress and make EBM more complicated. This is one reason that strategies to mitigate climate-related disasters need to be developed at national and international levels. The Great East Japan Earthquake (Tōhoku earthquake, March 2011), the subsequent tsunami, and resultant crisis at the Fukushima Daiichi nuclear power plant is a prime example of the compounding synergy that can arise in coupled human-natural systems [112] (Figure 2). The crisis at that power plant is the single most critical radiation accident since the Chernobyl accident (April 1986)

and Japan's biggest crisis since the Second World War. According to statistical data from the Japan National Police Agency (10 June 2020), the event resulted in 15899 confirmed deaths and 2526 missing persons presumed dead [113]. The tragedy caused severe damage to the coastal marine ecosystem and economic damage estimated at 309 billion US\$.

Sadly, the improvement of hazard warning systems is more strongly correlated with the destructive impact of natural disasters than with risk assessment policies. More often than not, the enhancement of hazard warning systems and the adoption of defensive strategies take place after a crisis has occurred. For example, investment in global tsunami warning systems mostly took place after devastating tsunamis [114]. That is how it happened in the case of the strong earthquake on Russia's East coast (5 November 1952) and subsequent tsunami, which destroyed the Severo-Kurilsk and settlements on the Kuril and Kamchatka coasts [115] (Figure 2). The tsunami warning system for Kamchatka was launched in 1955.

The increase of climate-related hazards and globalization of environmental issues demands a new generation of environmental monitoring systems to forewarn of impending disasters and a new generation of science and policy to prepare for disasters occasioned by climate change and framing sustainable development in the context of such risks. The transnational scale of climate change and marine systems coupled with ever-increasing social, economic, and political interactions bespeaks the necessity of a multilateral approach to the sustainable development of the Asia-Pacific's coastal and marine resources. To proceed otherwise increases the risk of conflict and reduces the likelihood of meeting individual nations' environmental and development objectives. Success is more likely following an approach that considers differences in climate change impacts and environmental perspectives of each nation in the region and promotes a constructive dialogue among the nations on the outstanding environmental issues, including the development of an EBMM strategy that recognises the Asia-Pacific region as an integral environmental unit characterized by a closely knit geo-climatic and political-economic structure. The following bullet points suggest measures that taken together, will increase the opportunity to capture mutual benefits toward the achievement of sustainable development in the Asia-Pacific region during the ongoing climate change epoch:

- A joint socio-cultural paradigm for designing a conceptual framework for mitigating adverse climate change impacts;
- A true consolidation of international consensus on marine issues under an EBMM values to promote a regional environmental strategy, including such principles as preserving peace and growing geopolitical responsibility;
- Investment in science and infrastructure to improve hazard warning systems with the goal of improved long-term forecasting;
- Agreement to acknowledge and address trade-offs in autonomous and multilateral decision-making, differences, and commonalities in national environmental perspectives, and strive to manage coastal and marine resources better and provide mutual assistance while fostering the development of solutions for climate change adaptation;
- Umbrella agreement to encourage diplomatic efforts regarding marine areas to reduce the possibility of conflict through shared goals and strategies and regional support for achieving Sustainable Development Goals.

Integrated and ecosystem-based marine policy should be seen as a versatile multidisciplinary and cross-sectoral instrument for international dialogue within the region.

4. Discussion: Toward an Asia-Pacific Marine Environmental Strategy

The preceding is not an exhaustive list of all relevant examples from nations whose interests and perspectives are increasingly intertwined in managing Asia-Pacific region marine resources. However, it suffices to highlight significant gaps in regional marine policy and identify the lack of coordination regarding coastal and ocean use as a gap that is causing difficulties. Moreover, the lack of coordination between scientific knowledge and policy decisions presents a critical gap in the national efforts to maintain and restore

the coastal marine environment. A recognition of the geopolitical and environmental realities of the world today could lead the region to understand the need for a full-fledged *Asia-Pacific Marine Environmental Strategy as a vital contribution to the dialogue of civilisations* and a significant milestone of international cooperation in the areas of food security and marine management.

The potential role of major maritime Powers in championing a regional approach to coastal and ocean management cannot be overstated Table 2.

Table 2. Characteristics of the major maritime Powers of the Asia-Pacific region.

State	Territory, km ²		Population 2020, Thous. Persons [116]	GDP 2019 [118]	Military Spending, Percent of GDP [119]			Management Tools [120,121]	
	Land Area [116]	EEZ [117]		US\$ Billion	2011	2020	Dynamics 2020/19	ICM Sites Established or Initiated (2018)	MSP Applications
USA	9,147,420	11,351,000	330,139	21,433	4.8	3.7	4.4	34	4
China	9,388,210	2,236,430	1,402,667	14,280	[1.7]	[1.7]	1.9	16	9
Russia	16,376,870	7,566,673	144,379	1700	3.4	4.3	2.5	0	2 (pilot)
Japan	364,560	4,479,674	125,769	5082	1.0	1.0	1.2	0	0
RO Korea	97,489	473,280	51,727	1647	2.5	2.8	4.9	1	0
Australia	7,692,020	6,369,268	25,653	1397	1.8	2.1	5.9	no data	5

The Russian case, in addition to the successful EBMM world practices is of specific interest in this connection. The Pacific coast of Russia is bathed by marine waters that correspond to Large Marine Ecosystems, ecoregions, and environmental regions, bioregions that are a combination of marine biogeographic and pelagic regions [122,123]. Among these are the Bering Sea, Okhotsk Sea, Sea of Japan, the Kuril and Aleutian island arcs, and the North-Western Pacific. Achieving sustainable development of the Russian Far East, with its 17,740 km coastline (without taking into account small islands) [88] and abundant marine resources, will make significant contributions to increase the environmental, economic, and political resilience of the whole Asia-Pacific region. At present, Pacific Russia's socio-economic situation is characterized by outmigration of the already low population (population density is 1.1 people per km²), low living standards, high tariffs on energy resources and oil product prices, poor energy and transport infrastructure, and a lack of investment resources. Yet 70–80% of Russia's fish and seafood are harvested in the Far Eastern Federal District. The Russian Far East sea shelf has vast mineral resource reserves, including about 29 billion tons of hydrocarbons. In addition, 42% of Russia's hydropower potential is concentrated here. The main components of anthropogenic environmental stress in this region are coastal water pollution from domestic, industrial, agricultural sewage, mining of construction materials in the coastal zone, and uncontrolled and illegal fishing. Nevertheless, the extent of adverse environmental impacts is much lower than in other adjacent Asia-Pacific areas (Figure 3a,b). Consequently, the environmental condition of Pacific Russia is comparatively good and relatively stable. However, the current marine management structure does not ensure sustainable development of Pacific Russia's biologically diverse marine ecosystems, which have no analogs elsewhere in Russia [124]. The Russian Far East's economic development is a national priority in the 21st century. Because the envisioned development relies on fisheries, aquaculture, and offshore oil and gas fields, all with essential ties to marine transportation, the economic development of the Russia Far East is inextricably dependent on balancing the needs of healthy marine ecosystems and those economic activities. Considering the environmental potential in this sphere, it may be assumed that a creative role of the Russian Federation in the field of marine environmental policy could have a significant impact on the strengthening of regional stability and security. It is best accomplished through a framework reliant on EBMM and strengthening international cooperation in the field of the environment and development across marine waters of the Asia-Pacific region.

The healthy and highly productive Pacific Russia marine ecosystems have comparatively high natural resilience and could serve as one of the stabilizing pillars for regional adaptation to climate change. Timely implementation of EBMM would provide needed protection for the rich bio-resources of the Russian Far Eastern continental shelf, while taking into account ongoing climate change and ever-increasing industrial activities in the coastal and marine zones, including anthropogenic pollution of the marine environment and transboundary transfer of pollution and other security issues [125]. The needs outlined above are well in keeping with the implementation of the national projects in Russia [126]. Since 2018, emphasis has been placed on either reinforcing environmental concerns into national projects related to sustainable development. The “Ecology” project, for example, contributes to fostering ecosystem-based approaches for nature management, including biodiversity conservation, an increase in the size of especially protected national areas and the effective implementation of an environmental management system [126]. The latter, in turn, provides strong incentives for users of natural resources to address shortcomings of the sectoral approaches to development planning. It recognizes the importance of protecting the ecosystem taking into account the effects of multiple uses through integrative approaches and use of the best available technologies and methodologies and the development of new capacities in a variety of management areas, including river, coastal, and marine issues. Assumption about potential benefits to project practice through applying MSP and ICOM appeared to be very relevant to ensure the conservation and sustainable use of the ocean environment and marine resources. However, the development of these management tools in the Russian Far Eastern region has still been hampered by institutional weaknesses, infrastructure deficits, capacity constraints, and uncertainty in the regulatory frameworks.

It is obvious that climate change will increase the intensity of extreme climate-related events but the present reality is that humankind cannot yet control climate change or its impacts. A vision and strategy are therefore required to enhance the human capabilities to meet the climate change issues and generate opportunities to ensure the long-term sustainability of the world’s development. Research concerning the cosmic influence on the Sun-Earth environment [127–145] adds an additional perspective to this end. This does not challenge the well-established evidence of dangerous anthropogenic interference with the climate system (such as the warming effects due to anthropogenic emissions from the pre-industrial period to the present) or minimize the importance of diplomatic agreements such as the framework Convention on Climate Change, to protect the climate from dangerous anthropogenic effects and avert the undesirable consequences of such effects. However, it does highlight limits to human understanding of fundamental causes of climate change. In this way, research in the field of Cosmoclimatology (an advanced hypothesis of climate change that “interacts creatively with current issues in solar-terrestrial physics and astrophysics and even with astrobiology, in questions about the origin and survival of life in a high-energy universe” [127].) regards an additional perspective on the fundamental drivers of observed and projected trends in climate change that have an impact on prosperity of the Earth’s bio-productivity, including variations in marine biodiversity [127–129]. This hypothesis suggests, in particular, that galactic cosmic rays’ influence on cloud formation is an important indirect cause of climate variations (global warming or cooling), which in turn affect life diversity and determined the progress of evolution on Earth over the last 500 million years [127–130]. Such studies lead to the assumption that potentially the influence of cosmic factor on climate warming during the 20th century is more significant than that of manmade CO₂. In this context, it is also not irrelevant to recall that the warmest period of the Holocene—the so-called “Atlantic optimum,” which occurred 5000–7000 years ago, exceeded the average temperature in the twentieth century by 1–2 °C [131]. As to the variations in climate and biodiversity, the ultimate causes have been under debate [132,133]. Several studies adhere to entirely an opposite point of view, therefore casting doubt on the influence of the variations in cosmic rays and cloud coverage on Earth’s climate [134–136]. Studies of cosmic ray variation with geophysical variables of the Sun and changing geomagnetic field, however, identified various aspects of the

mechanism of the cosmic Sun-Earth connection on environment of the Earth that provides evidence favoring the possible cosmic ray influence on climate [137–144]. Research efforts highlight the potential of the Star-Sun-Earth connection to influence the thermosphere, atmosphere, ionosphere, hydrosphere, and lithosphere and thus shed light on alternative possibilities of predicting earthquakes and climate events [130,145]. This is reflected in the estimated a correlation between some geomagnetic events and cooling episodes in the North Atlantic coincided with episodes of enhanced aridity in the Middle East that highlights the potential for cosmic climate-forming factors impact on economic, social, and political instability followed by the history trajectory of civilisations [146]. While such arguments are more based on the experimental evidence and theoretical considerations, and the exact mechanism of the cosmic and Sun-Earth connection's effect on environment of the Earth and relative importance still remain to be addressed, from this the cosmic climate-forming factors together with anthropogenic factors might have far-reaching and tragic consequences in the absence of timely coordinated actions. It is, therefore, safe to consider the pursuit of focused topical studies in this field and the development of an international scientifically-based framework for Earth environment safety as appropriate subsequent steps for human action, especially in light of the climate unsustainability.

In social and cultural settings, this would mean overcoming fragmented national efforts and achieving intercivilizational harmony through understanding common heritage of humankind within an *Environmental Philosophy of the Universe*, which means an entire sense of equality of all nations before law of the Universe that is the universality of the changing environment of the Earth. Healthy oceans are significant for maintaining Earth's climate and its high environmental, social, and economic value to people. The global ocean makes an essential contribution as a planetary reservoir for heat, water, and CO₂ and as a source of vital resources for food security and for sustaining economic prosperity. In addition, rising sea levels and relative challenges constituted a threat to the world's coastal areas, the existence of some small islands and the well-being of their populations [147–149]. The Asia-Pacific region has had its share of such concerns. Among them are many instances of severe erosion due to sea level rise, and several low-lying Pacific Islands in Micronesia and Solomon Islands have already been lost [148]. National adaptation planning for sea level rise was developed in many countries with a coastline but regional coordination and common assessment standards in this issue have to date proved difficult to achieve [147,149]. The improvement of coordination and cooperation in ocean affairs is a foundational aspect of the *Strategy*. The outlined issue of the cosmic and ecosystem sustainability seems promising for extension of the EBMM methodology in the face of climate change to make good political decision on environmental issues and develop integrated approach in marine management [150].

Joint development of an *Asia-Pacific Marine Environmental Strategy* would be a significant step toward implementing the U.N. Agenda for Sustainable Development in the Asia-Pacific region and could stimulate interest in developing an *Asia-Pacific Environmental Union* (APEU) (Figure 4). Ancillary benefits of developing an Asia-Pacific Marine Environmental Strategy will arise from an increased alignment of national policies and the identification of shared objectives for environmental security in the face of cumulative anthropogenic effects of regional marine activities and environmental change. Coordinated national sustainable development strategies supported by scientific and economic frameworks could be the initial base for these actions. Equally, there is a need to expand scientific horizons aimed at understanding climate change and cooperative goal setting for issues that require the engagement of the transnational community. The following bullet points suggest steps that could aid in the development of a science-reinforced *Asia-Pacific Marine Environmental Strategy* based on peacekeeping priorities:

- Encourage scientific research on cosmic and other natural drivers of climate change to complement ongoing research on anthropogenic drivers;

- Encourage each Asia-Pacific nation to move toward an integrated approach to marine policy guided by the enduring principles of international law, with due regard for the traditions and national practices;
- Use global experiences in the coastal and ocean management and multidisciplinary scientific approaches to guide the methodological evolution of EBMM in the face of climate change;
- Explore the formation of an *Asia-Pacific Environmental Union* (Figure 4).

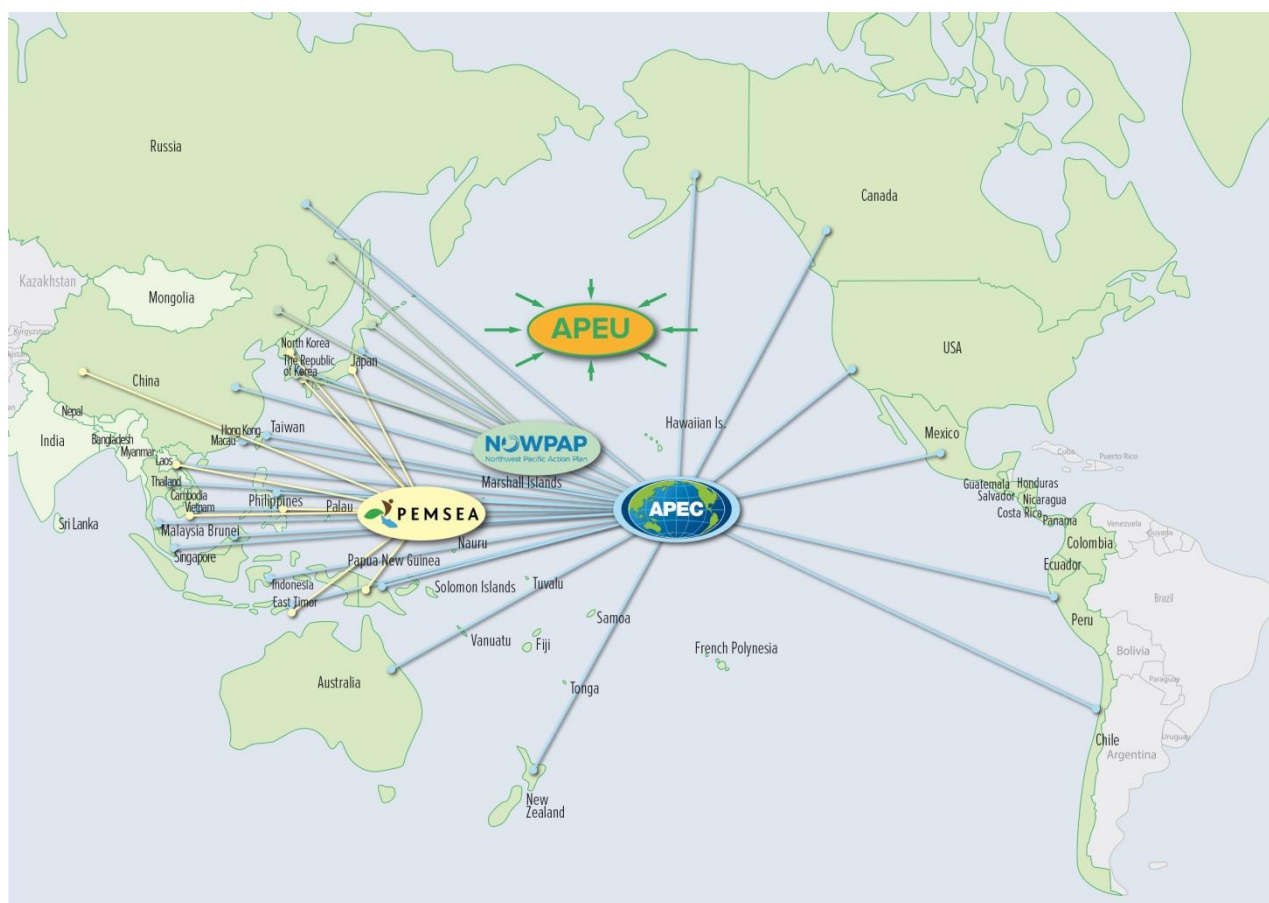


Figure 4. Potential contribution of an integrated maritime policy to development of the Asia-Pacific Environmental Union (APEU).

The practical experience of nations and international organizations, including PEMSEA, NOWPAP and Asia-Pacific Economic Cooperation (APEC), working to advance sustainable coastal and marine resource management can help guide the Asia-Pacific region's environmental integration in the initial stages [68,120,151] (Figure 4). Support for intraregional research projects and analyses to address the Asia-Pacific region's marine environmental condition would also represent a vital contribution to the U.N. Ocean Decade [152].

This strategy should more fully realize science and policy interaction to achieve environmental integrity and mutual geopolitical understanding. It is indicative that one of the objectives of the UNESCO/IOC Sub-Commission for the Western Pacific (WESTPAC) for marine science development per the U.N. Decade of Ocean Science for Sustainable Development (2021–2030), is to involve the Member States in the development and implementation of adaptation strategies and policies for maintaining a life-supporting ocean to ensure adequate management of the marine environment to provide common protection and prosperity in a changing world [153].

The aspects, features, and perspective of marine environmental management of the Asia-Pacific region described above give reason to believe that an *Asia-Pacific Marine Environmental Strategy* could carry considerable weight in the global development of EBMM and its potential to contribute to civilisations dialogue that could consolidate conditions of peace and prosperity in the Asia-Pacific region and around the world.

5. Conclusions

By focusing on shared concerns, environmental cooperation, such as a multilateral approach to coastal and marine resource governance in the Asia-Pacific region, can reduce conflict potential and strengthen global security. World experience in marine management demonstrates that ecosystem-based marine management improves scientific understanding and conceptual knowledge for national and transnational marine policy. The combination of anthropogenic and climate change pressures on coastal and ocean ecosystems highlights the need to extend the ecosystem-based approach to marine management to include considerations of conflict avoidance, human wellbeing, and the role of cosmic and anthropogenic drivers of climate-related marine processes. With its environmental and socio-economic synergism, the Asia-Pacific region can be viewed as a test case for the international community to promote stable, sustainable development through coordinated activities. An opportunity to explore strategic integrated marine policies that enhance collective responses to anthropogenic and climate-related environmental challenges. These activities could proceed under the umbrella of an *Asia-Pacific Environmental Union*, which could help diffuse geopolitical military concerns within the context of environmental instability. It is necessary, however, not to underestimate the complexity of the process. Moreover, it would be prudent to strengthen regional environmental relations based on a hard look at long-term risks to shared interests in marine management, sustainable development, and security in the light of global climate challenges.

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Appendix A

The relevant literature and materials were indicated according to the following categories:

- Category 1 [1–3,5–9,11].
- Category 2 [4,10,13–15,19–29,34–36,39,69,73,77–81,85,86,88,93,121,123–125].
- Category 3 [16–18,31–33,40,42–44,46,74–76,82–84,89–92,98].
- Category 4 [12,30,37,38,41,45,47–49,67,68,70–72,87,94,151–153].
- Category 5 [50,54,66,95–97,99–115,127–131,137–150].
- Category 6 [51–53,55–65,116–121].

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