

Blue Economy in APEC: Pathway towards Sustainability, Climate Action and Inclusion

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Abstract

The Blue Economy concept was adopted during the preparatory process for Rio+20 by a proposal from several coastal countries and contemplates the objectives of improving human well-being and social equity based on the sustainable management of the oceans, while reducing environmental risks and ecological damage. The objective of this article is to present the importance of the blue economy in APEC, as well as its contribution to sustainability in the face of the climate crisis. To meet the objective, first, the concept of the blue economy and its relevance worldwide are explained. Second, APEC statements, policies and actions aimed at promoting the blue economy in the region are analyzed. Third, some examples from member countries are presented, as well the inclusion of the women in the sector. The research was performed applying the PRISMA methodology. The results show that that the oceans definitely can contribute for food security, aquaculture, sustainable fisheries, and gender inclusion. We conclude that blue economy is important to address the impacts of climate change, and promote sustainable and inclusive development in the Asia-Pacific region, and that regional cooperation is crucial to foster global cooperation in blue economy.

Keywords

Oceans, Sustainability, Fisheries, Adaptation, Mitigation, Gender Inclusion

1. Introduction

The Blue Economy (BE) concept was adopted during the preparatory process for Rio+20. Many coastal countries suggested that the term Green Economy can be described as Blue Economy when applied to coasts and oceans. This approach contemplates: “improving human well-being and social equity, while reducing environmental risks and ecological damage” (UNEP et al., 2012), according to

the needs of countries whose development depends on marine resources.

The Blue Economy is the vehicle through which APEC member states seek to address mutual problems and development aspirations such as inclusive growth and sustainable development. In this way, the blue economy constitutes a transversal issue in APEC's priorities, including women's economic empowerment. The key sectors of the Blue Economy are Fishing and Aquaculture, Ocean Renewable Energy, Ports and Maritime Transport, Marine Hydrocarbons and Seabed Mining, Marine Biotechnology, Research and Development and Tourism. The principles of cooperation between APEC member states are sovereignty, territorial and political independence, mutual benefit and peaceful coexistence (Ivanova et al., 2017).

By 2030, the area of marine protection zones will expand from the current 11% to 30%. The United Nations has enshrined the protection of oceans and seas in Goal 14 Life below water of the Sustainable Development Goals. The United Nations Decade of Ocean Research for Sustainable Development began in 2021, because there is much we still don't know about this enormous ecosystem and the consequences of human interference.

The importance of the blue economy is highlighted in the proclamation by the United Nations of the Decade of Ocean Sciences for Sustainable Development (2020-2030) to guarantee the full support of marine sciences for the sustainable use of the oceans, generating synergies with the social sciences and humanities to promote the conservation of natural resources and contribute to the well-being of communities. All of the above would support countries to achieve the Sustainable Development Goals of the 2030 Agenda (APEC, 2014a).

The Xiamen Declaration "Towards a new partnership through ocean cooperation in the Asia-Pacific region" includes: "...four priority areas: conservation of coastal and marine ecosystems and resilience to disasters; the role of the ocean in security food and food-related trade; marine science, technology and innovation; and the blue economy" (Ivanova & Torres, 2021: p. 5).

The objective of this article is to present the importance of the oceans and the blue economy in APEC, as well as their contribution to sustainability, food security and gender inclusion in the face of the impacts of climate change. The chapter is divided into the following sections. The second section explains what the blue economy consists of and why it is important to promote sustainability and inclusion. The third section presents the most relevant APEC statements and actions dedicated to sustainable ocean management and the blue economy in APEC. The fourth section explores the most relevant components of the blue economy: fishing and aquaculture, food security, climate action and the sustainable management of marine resources. Examples of the initiatives of some APEC member countries are presented in the fifth section. The sixth section relates the blue economy to gender equality and inclusion in the Asia-Pacific region.

To develop the study, the PRISMA (Preferred Reporting Items for Systematic

Reviews and Meta-Analyses) methodology was applied to carry out systematic reviews and meta-analyses in scientific research. The PRISMA method provides a structured and transparent framework, ensuring the appropriate inclusion of relevant studies and the clear presentation of results. A search was carried out for articles from indexed journals on several academic websites: Web of Knowledge, Scopus and Google Scholar between 2010 and 2022. These sources were complemented with some reports and statements from the APEC website. The selection criteria were “ocean”, “blue economy”, “climate change”, “sustainability”, “inclusion”, and “Asia-Pacific”. The results were presented and analyzed, allowing some final conclusions to be reached.

2. Blue Economy: Concept and Relevance

SDG 14 presents the importance of the ocean, as well as the opportunities and challenges presented by its sustainable use: “Conserve and sustainably use the oceans, seas and marine resources for sustainable development” (UNGA, 2015). The *Ocean Foundation (2023)* reports that human activities are responsible for the 30% increase in ocean acidity over the past two centuries. By 2023, 83% of the global carbon cycle will circulate through the ocean, while 50% of coastal habitats absorb almost half of the total carbon sequestered in coastal areas (*Blue Carbon Initiative, 2023*). These pressures, along with a projected increase in the world’s population to 10 billion by 2050, will undoubtedly intensify global competition for resources, make sustainable ocean management an area of primary importance (*World Resources Institute, 2018*).

According to the Food and Agriculture Organization of the United Nations (FAO), almost 60 million people around the world (more than 96% of them in emerging countries in Asia and Africa) work in the fishing, farming sector, and aquaculture (*Roberts & Ali, 2016*). According to the South Asian Ocean Management Association (*PEMSEA, 2020*), the blue economy annually generates USD \$1.5 trillion (2.5% of global gross value added) and employs 31 million people. By 2030, this is projected to rise to USD\$3 trillion, with aquaculture rising sharply (8.5% annually currently), offshore wind, fisheries management, and shipbuilding and repair (*Ivanova & Torres, 2021*). The blue economy is particularly important for the future of small island developing countries (*UNDP, 2023*), because development is a way to promote the inclusion, well-being and standard of living of the population. International law is a key component for the blue economy along with ocean governance (*Voyer et al., 2018; Serrano, 2022*). “The BE strengthens environmental legislation and institutional arrangements that empower communities, civil society organizations, and public entities” (*Ivanova & Torres, 2021: p. 3*).

This paragraph presents the newest definitions of the Blue Economy based on the United Nations document *Blue Economy Definitions (UN, 2023)*. According to the World Bank, the blue economy is the “sustainable use of ocean resources for economic growth, better livelihoods and jobs, while preserving the health and ecosystems of the oceans”. The European Commission defines it as “All

economic activities related to oceans, seas and coasts. It encompasses a wide range of interrelated established and emerging sectors”. The Commonwealth of Nations considers it “an emerging concept that encourages better stewardship of our ‘blue’ oceans or resources”. Conservation International adds that “the blue economy also includes economic benefits that cannot be untraded, such as carbon storage, coastal protection, cultural values and biodiversity”. The Center for the Blue Economy says that “it is now a term widely used around the world with three related but distinct meanings: overall contribution of the oceans to economies, the need to address the environmental and ecological sustainability of the oceans and the ocean economy as a growth opportunity for both developed and developing countries”. Recently the Blue Economy was characterized as an economy that “comprises a range of economic sectors and related policies that together determine whether the use of ocean resources is sustainable. A major challenge of the blue economy is to better understand and manage the many aspects of ocean sustainability, ranging from sustainable fisheries, ecosystem health and pollution prevention. Second, the blue economy challenges that the sustainable management of ocean resources will require collaboration across borders and sectors through a variety of partnerships, and on a scale that has not been achieved before. This is a difficult task, especially for small island developing states (SIDS) and least developed countries (LDCs) that face significant constraints”. [FAO \(2014\)](#) defines BE as: “A rational approach to the sustainable and comprehensive management of the oceans and coasts” ([Steven et al., 2019](#); [Ivanova & Torres, 2021](#)).

It is important to promote international cooperation to exchange successful and innovative experiences, transfer technologies and support developing countries with financial resources and capacity building ([ADB, 2022](#)). In this sense, regional integration agreements, where the majority of countries border the ocean (as is the case of APEC) can be the engine to promote BE at a global level.

Also the concept of Blue Economy is an emerging theoretical concept, we can outline some main components, presented in [Table 1](#).

3. APEC: Pathway towards Sustainability

The Declaration on Climate Change, Energy Security and Clean Development ([APEC, 2007](#)) begins with the assertion that economic development, energy sufficiency and the impacts of climate change are fundamental and interrelated challenges for the APEC region, also intrinsically linked. with food security and access to water ([APEC, 2007](#); [Cuevas & Ivanova, 2020](#)).

In 2016 APEC adopted a declaration on promoting quality human growth and development ([APEC, 2016](#)). It specifies the political commitments of APEC countries to address challenges and explore areas of opportunity to promote the free movement of goods, services and capital, with complementary priorities such as food sufficiency, climate action and access to water resources. Member countries strengthen their cooperation in this area through the APEC Program

Table 1. Components of the blue economy.

Components of the Blue Economy			
Type of Activity	Ocean Service	Industry	Drivers of Growth
Harvest of living resources	Seafood	Fisheries	Food Security
		Aquaculture	Demand for Protein
Extraction of non-living resources, generation of new resources	Marine biotechnology	Pharmaceuticals, chemicals	R & D for health care and industry
	Minerals	Seabed mining	Demand for minerals
	Energy	Oil and gas	Demand for alternative energy sources
		Renewables	
Commerce and trade inland around the oceans	Freshwater	Desalination	Demand for freshwater
		Shipping	Growth in seaborne trade; International regulations
	Transport and trade	Port infrastructure and services	
	Tourism and recreation	Tourism	Growth of global tourism
		Coastal Development	Coastal urbanization
Response to ocean health challenges	Ocean monitoring and surveillance	Technology and R & D	Domestic regulations
	Carbon Sequestration	Blue Carbon	R & D in ocean technologies
	Coastal Protection	Habitat protection and Restoration	Growth in coastal and ocean protection and Conservation activities
		Waste Disposal	Assimilation of nutrients and Wastes

on Food Security and Climate Change (IISD, 2016). In addition, governments committed to redoubling efforts to address and reduce the impacts of climate-caused disasters, such as droughts, floods and others that affect food production (APEC, 2022). On the other hand, APEC fosters cooperation for the sustainable use and management of water; another of its commitments to the Sustainable Development Goals (SDGs) is to increase the fight against illegal wildlife trafficking (APEC, 2014d). Additionally, to advance the SDGs, the Forum is committed to guaranteeing decent work and a quality working life for all, and especially for women and other vulnerable groups. This is through access to inclusive education and capacity building, the promotion of entrepreneurship and cooperation for the transfer of clean technology between member economies (see Table 2).

The Putrajaya Vision (APEC, 2020) envisions an open, dynamically developing, resilient and peaceful Asia-Pacific community by 2040, ensuring the well-being of present and future generations. This vision will be achieved by pursuing the following three economic goals:

Trade and investment: to ensure that Asia-Pacific remains the most dynamic and interconnected regional economy in the world, the importance of a free,

Table 2. Contribution of the oceans and the blue economy to the SDGs.

GOAL	CONTENT	CONTRIBUTION OF OCEANS AND BLUE ECONOMY
 1	Fight and end poverty in the world.	*By 2030, raise the resilience of the poor to the impacts of extreme events. *Healthy marine ecosystems promote healthier local communities, thanks to a better quality of lifestyle and food supply.
 2	Fight and end hunger by improving access to food and nutrition.	The sustainable use of marine resources as well as law enforcement will provide a continuous supply of food.
 3	Guarantee good health and well-being of human beings on our planet.	Waste-free oceans have fewer pathogens with negative consequences for humans (infectious diseases, etc.).
 5	Promote inclusion and protect the rights of women and girls.	The Blue Economy promotes the inclusion of women in the main sectors, promoting gender equality.
 6	Guarantee access to drinking water and sanitation to the entire population of the world.	Water desalination converts seawater or brackish water into drinking water to ensure access to fresh water for the vulnerable population.
 7	Promote access to renewable energy for all human beings.	The ocean provides waves, tides and other sources of renewable energy. This ensures supply to remote communities and mitigates carbon dioxide emissions.
 8	Promote inclusive and sustainable growth, and the availability of decent work for all the world's inhabitants.	*Alternative marine tourism, as well as sustainable aquaculture, can greatly contribute to the well-being of coastal areas and islands. *Promoting the circular economy can reduce ocean pollution from liquid and solid waste.
 10	Reduce inequalities within each country and between the world's economies.	Recognize the common but differentiated responsibilities of the Global North and South, providing resources to small island countries and vulnerable coastal areas.
 13	Policies and action against climate change. Promote mitigation and adaptation actions.	*Shallow coastal water ecosystems such as mangroves, salt marshes and seagrass beds are keys to managing natural carbon sinks. *Coastal habitats such as coral reefs, mangroves and salt marshes protect from extreme events such as cyclones and hurricanes, storm flooding and rising mean ocean levels and prevent coastal degradation.
 14	Sustainable use of the seas to protect biodiversity and promote the well-being of the population.	The blue economy and sustainable ocean management prevent damage to underwater life that is due to ocean acidification, species migration, coral bleaching, etc.

Continued



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Promote the consolidation of communities, peaceful societies for sustainable and inclusive development. Promote universal access to justice through appropriate institutions.

*Strong institutions and inclusive societies are very important for sustainable development and climate adaptation and mitigation.

*APEC provides a good framework for ocean management and blue economy promotion, which could be emulated by regional organizations such as ASEAN, TPP, etc.



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Promote the consolidation of the Global Alliance for sustainability and inclusion.

International cooperation is of utmost importance to promote sustainability and climate action. Investments in the blue economy are a key tool to help the Global South carry out adaptation and mitigation tasks, as well as raise their standards of living.

Source: produced by the authors.

open, fair, non-discriminatory, transparent and predictable trade and investment environment. Important components are the promotion of uninterrupted connectivity, stable supply chains and ethical and responsible business conduct.

Innovation and digitalization: foster an enabling environment based on the digital economy and innovation to make the interconnected global economy a reality. In this context, it is necessary to strengthen digital infrastructure, accelerate the digital transition, minimize digital inequality between countries and regions, as well as cooperate to guarantee greater access to data and foster user confidence in the digital economy.

Strong, balanced, secure, sustainable and inclusive growth: to ensure the resilience of the Asia-Pacific region is resistant to crises, pandemics and other extreme events, development has to be inclusive and bring greater health and well-being for all, including MSMEs, women and youth. In this sense, the inclusive development of human capabilities, as well as cooperation in finance and technology, must be promoted to better prepare people and provide them with knowledge for the future. Economic policies, cooperation and development must contribute to global efforts to confront the negative effects of climate change at the planetary level.

In implementing the Putrajaya Vision 2040, the economies will build on APEC's founding documents, including the 1994 Bogor Goals and the 1995 Osaka Action Agenda. APEC economies remain committed to APEC's mission and its principles of voluntary and egalitarian, non-binding and consensus-building association for the creation of common well-being.

The Aotearoa Action Plan (APEC, 2021) sets out individual and collective actions and targets to achieve the Vision. Economies will review and adapt the Aotearoa Action Plan periodically to ensure it remains comprehensive, balanced and relevant across all elements of the Vision. It is designed to be a living and flexible document. Each objective also includes the evaluation of progress. An important instrument to advance the Putrajaya Vision is the Bangkok Goals on

biocircular green economy, which also includes the blue economy vision (APEC, 2022).

Since 2011, Blue Economy Forums have been organized, focusing on the tasks of promoting green growth in the marine sector; achieving the blue economy in terms of sustainable development; dialogue between public and private sectors; as well as ways and practices for cooperation. The objective of these forums has been to advance the understanding of the Blue Economy, facilitate its mainstreaming and develop unanimity in the establishment of regional cooperation.

4. APEC: Oceans and Blue Economy

It is estimated that ocean industries contribute on average 8% of the GDP of APEC economies. The ocean economy represents 15-20% of total GDP in several APEC member countries (APEC, 2014a; Gamage, 2016). Fisheries and aquaculture, shipping and transportation, coastal tourism and marine energy are important marine industries in APEC. Among these industries, the contribution of capture fisheries and aquaculture to agricultural and total GDP is around 16% and 0.6%, respectively. Additionally, the fishing and aquaculture industries in APEC employ 60% of the world's total fishing workforce. Maritime transport supports 90% of the volume of world trade. Seventeen of the top 20 ports in terms of cargo handling capacity are located in APEC. Tourism is a vital source of income and employment for APEC economies. According to the Xiamen Declaration (APEC, 2011; APEC, 2014b), the APEC Fisheries and Oceans Working Group (GTPO) is the entity that develops the policies and actions of the EA, to promote the sustainable use of resources and ecosystems of the seas and coasts (Ivanova & Torres, 2021).

The challenges of meeting the food demand of the world's growing number of inhabitants require sustainable food supply chains that are based on stable resources, functional markets and free and fair trade (APEC, 2014c). Marine resources in the Asia Pacific region are essential for food security in the region, as this region produces two-thirds of the world's fishery catch, 80 percent of global aquaculture production and per capita fish consumption is 65 percent higher than the world average (Fang et al., 2015).

However, the performance of the Asia-Pacific oceans and coasts face serious threats due to pollution, biodiversity loss, resource decline, multiple conflicting coastal uses, as well as climate change and natural disasters. About 60% of the Asia-Pacific region's mangroves and 70% of its coral reefs are threatened by the impacts of climate change (Ivanova & Torres, 2021).

All of the above is a serious threat to Southeast Asia. It is estimated that between 13% and 61% of Pacific Ocean fish stocks are overexploited, with the highest percentage in the Southeast Pacific.

4.1. Fisheries, Aquaculture and Food Security

The Asia Pacific region consumes 70 percent of the world's seafood products.

However, several policies are needed in the conservation and management of fishery resources, among others, the fight against illegal, unreported and unregulated (IUU) fishing. The degradation of coastal ecosystems and marine resources, the impacts of climate change, as well as natural disasters represent threats to the resilience of these resources and the coastal communities whose livelihoods depend on them. The loss of fish worldwide is estimated between 20% - 75%. Other challenges include illegal, unreported and unregulated (IUU) fishing, and limited access to food for vulnerable groups. In this regard, the elimination of undue subsidies for fishing was very important (Chen, 2022). Support for small-scale fishing communities is important due to their greater economic and environmental vulnerability (Juneja et al., 2021).

Aquaculture in the APEC region is the fastest growing food producing sector in the world. It is expected to increase to 62 percent of total fishing production by 2030, and to become the main supplier for the growing demand of the emerging global middle class. Sustainably and responsibly managed aquaculture in the Asia Pacific region is of utmost importance for global food security (McIlgorm, 2011). Likewise, it is important to promote innovation in aquaculture and fishing to generate resilience to the impacts of climate change. Climate scenarios related to food production are prepared and disseminated by the APEC Climate Center (APCC).

APEC's policies on food security are reflected in the Niigata Declaration on APEC Food Security (APEC, 2010a), the Kazan Declaration (APEC, 2012a) and the Beijing Declaration (2014) on APEC Food Security, closely related to the plans and declarations on oceans and fisheries, such as the Seoul Ocean Declaration (APEC, 2002), the Bali Action Plan (APEC, 2005), the Paracas Declaration and its Action Agenda (APEC, 2010b) and the Xiamen Declaration (APEC, 2014b; APEC, 2016; Ivanova & Torres, 2021).

4.2. Climate Change: Mitigation and Adaptation

The coastal ecosystems of mangroves, marshes and wetlands provide important benefits and ecoservices for adaptation to climate change in coastal areas. They protect against cyclones, coastal flooding and rising mean sea levels. They are also habitat for the reproduction of several marine species important for commercial fishing and nature tourism (NCAPEC, 2022). Additionally, these coastal ecosystems absorb and store significant amounts of carbon dioxide from the atmosphere, called blue carbon, which makes them an important component in climate change mitigation (IPCC, 2022).

By complying with the three components of sustainability: economic, environmental and social, blue carbon represents an intrinsic part of the blue economy (Steven, Vanderklift, & Bohler-Muller, 2019; Ivanova & Torres, 2021), in addition to becoming an industry in itself (Blue Carbon Initiative, 2023) that is contributing to the fight against climate change and generates sustainable and low-carbon lifestyles.

With respect to minimizing ocean acidification, APEC economies are also

contributing to international efforts to study and monitor the oceans, including the Integrated Marine System Ocean Acidification Observing System and the Global Ocean Observing Network. Ocean Acidification (McIlgorm, 2016; APEC, 2012b).

Asia Pacific is one of the most vulnerable regions to be affected by catastrophic events and suffers greatly from the loss of life and wealth as a result of disasters. The aggregate impacts of human activities and climate change have significantly increased the unpredictability of disasters, the difficulty of response actions and highlight the urgency of forecasting and protecting from strong impacts (NCAPEC, 2022; IPCC, 2023). APEC economies have adopted a comprehensive strategy approach, including developing policies, laws and plans and establishing institutions to address the challenges of climate change (Kittipaisalsilpa, 2023). This approach also supports marine research, monitoring and evaluation, capacity building and regional cooperation to improve the accuracy of climate scenarios to forecast the impacts of climate change on the oceans and the mitigation, adaptation and risk reduction measures necessary to deal with marine disasters.

5. Blue Economy in APEC's Members

The Implementation Plan of the Sustainable Development Strategy for the East Asian Seas (SDS-SEA) 2018-2022 presents important advances, although it was affected by the COVID-19 pandemic. Eleven of the participating countries (Cambodia, China, Indonesia, Japan, Laos, Philippines, RO Korea, Singapore, Timor-Leste, Thailand and Vietnam) submitted reports on the implementation of their integrated coastal management (ICM) programs at the national and local levels. The PEMSEA Report (2020) also reports progress in the management of seas and coasts and the assessment of the blue economy of several Asia-Pacific countries (Ivanova & Torres, 2021).

Maritime laws, policies and regulations are enacted by economies to regulate marine economic activities, protect the marine environment and conserve marine biodiversity (Ebarvia, 2016). Marine science and technology are strengthened through regional initiatives, programs and projects associated at the economic level. Public participation is encouraged as a necessary component of integrated marine management (Bennett et al., 2022). Projects sponsored by the APEC Secretariat and training programs organized by APEC centers also help economies improve their capacity for sustainable marine development.

For the protection and restoration of marine assets and coastal ecosystems, APEC economies have made commitments and implemented policy measures. Below are some examples of actions to protect the ocean and promote the blue economy by some of the APEC member countries. Australia has committed A\$6 million to the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security to conserve ocean hyperbiodiversity in this region. As one of the most coastal maritime countries in the world, Indonesia has formulated the Development

Plan for 2020-2045 which is aimed at strengthening the blue economy at the regional and global levels (Putri et al., 2023). The 75 million CAD Coastal Restoration Fund was established by Canada to address historically degraded areas and provides support to projects that contribute to Chile's national coastal restoration plans. The Biodiversity Strategy 2017-2030 establishes the main strategic guidelines and national objectives for the conservation and sustainable use of biodiversity until 2030 (UNDP, 2023).

China's Blue Bay restoration policy aims to restore, between 2016 and 2021, threatened ecosystems in ecologically important coastal and marine areas as part of the China National Biodiversity Conservation Strategy and Action Plan (NBSAP) 2011-2030. Other action plans include Biodiversity Strategy Action Plan 2016-2021 (Hong Kong, China). Mexico is implementing the Strategic Action Program of the Large Marine Ecosystem of the Gulf of Mexico with 12.9 million dollars from 2017 to 2021.

The National Management Plan for Coastal and Marine Ecosystems in the Philippines has been approved. In turn, Thailand established a National Committee for Marine Resources and Coastal Resources Management, committed to restoring 17,000 hectares of marine and coastal areas. New Zealand's National Plan (2017-2022) includes protection of sharks, seabirds and management of threats to sea lions from commercial fishing operations (Wenhai et al., 2019). It is worth mentioning that due to the impact of the COVID-19 epidemic, compliance with previous programs has been postponed for the purposes of the year 2023.

6. Blue Economy: Equity and Gender Inclusion

This section will discuss the inclusion and equality of women in two of the main sectors of the APEC blue economy, where the greatest participation of women has been recorded: fishing and aquaculture, and sea and coastal tourism.

6.1. Fishing and Aquaculture

Regarding the fisheries and aquaculture sector, the contribution of women is overlooked or underestimated. Although the participation of women is very important to have a reliable supply of food from the ocean, on which 3 billion people depend for their daily source of protein, they occupy lower paid, lower status and less protected jobs.

Sustainable use of the ocean improves when women's roles in the sector are better understood. It has been observed that when women manage key fisheries resources it has promoted compliance with coastal ecosystem regulations (Jenkins & Brown, 2023). Additionally, women's increasing access to improved processing technologies reduces waste and increases product value, providing fishermen with equal income while catching fewer fish.

Traditionally, women participate more in nearshore activities such as gathering and activities known as "gleaning" (Siles et al., 2019). Gleaning can be car-

ried out close to home and with low-cost tools, making it easier for women to participate. Women's work includes post-harvest processing, net making and selling of fish. They have primary responsibilities for jobs such as cleaning, smoking, salting and drying, as well as selling fish and seafood at local markets.

Women frequently collect marine resources in near-shore ecosystems, such as mangroves, where the fish they capture reproduce. It has been observed that where there are women managers of mangroves and wetlands, they lead to an increase in the population of fish available for fishing (APEC, 2019). Similarly, efforts to conserve mangroves as part of fisheries management efforts can improve the well-being of communities.

In all fishing small and medium enterprises (SMEs), there is evidence how women and men have differentiated roles, including the types of products they sell, the business opportunities they have. Limited access to financial resources due to discrimination affects women's participation in business (UNDP, 2023). Participation in the fishing sector is in small and medium-scale businesses, often because in many parts of the world, self-employment is one of the few options for women. In some cases, such as in Mexico, women owners and managers of small businesses in most cases inherited them and have the support of their families to successfully manage their businesses and prosper (Siles et al., 2019).

Although more women than men work in the sector, women more frequently participate in low-skilled and poorly paid jobs and have irregular seasonal jobs in processing, packaging and marketing (Niño Vázquez & Crisologo, 2022). They often lack adequate contracts, health security and labor rights. Women participate in a range of activities along the value chain, but this does not give them decision-making power because some of their activities do not have a formal nature and recognition.

In general, we can conclude the following. There is a gender work and pay disparity, with women having a significant presence in processing, but not in fisheries management or ocean decision-making bodies. Many women do not have equal access to opportunities, resources, financing, market information, technology, training, mobility and bargaining power (World Bank Group, 2023).

6.2. Sea and Coastal Tourism

In several APEC countries, primarily SIDS, tourism accounts for between 30% and 80% of total exports, with women's participation reaching up to 54%. But the majority work in low-skilled, casual and temporary jobs. Blue tourism is one of the most important sectors where women work, although it tends to be segregated by gender. Female participation in tourism exceeds 30% in 9 of the 14 SIDS countries for which data is available, and over 60% in 5 of the smallest countries (Pacific Women, 2021). The tourism workforce often has better job opportunities for employment, advancement, leadership and entrepreneurship. However, evidence from several SIDS shows that women are concentrated in low-paid and precarious positions in the tourism sector and do not achieve pro-

fessional-level employment (Hamilton, 2020; World Bank Group, 2018).

The tourism sector focuses on minimum wage jobs, including reception and housekeeping positions. World Bank Group (2018) surveys found that the main reasons why the differences in remuneration between men and women in the tourism sector persist is that female employees are highly concentrated in cleaning jobs, food and beverage and reception positions with salaries lower and are less likely to be promoted or compensated for working overtime (World Bank Group, 2018). Limited access to capital or assets such as land limit women's ability to start or grow their businesses in the tourism sector (Jenkins & Brown, 2023). Empowerment through better job opportunities for employment, advancement, leadership and entrepreneurship (Siles et al., 2019). In the world, compared to the economy as a whole, the gender gap in the sector is slightly smaller: women's income is 15% less than men's in tourism (compared to 17% less in the economy in general). And women hold 54% of jobs in tourism (compared to 39% in the economy as a whole) (Hamilton, 2020).

The tourism sector is very vulnerable to crises such as pandemics, climate disasters or internal crises. The tourism industry has been disproportionately affected by COVID-19 due to global travel restrictions. In the Caribbean, women were more likely to lose income due to hotel and restaurant closures during the COVID-19 pandemic because they fill jobs that are easily suspended in the absence of customers (Jenkins & Brown, 2023). In the Pacific region, there is strong evidence that women-owned businesses have suffered more negative impacts than men-owned businesses during the pandemic. At the end of 2021, 20% of women-owned businesses had temporarily closed compared to 8% of men-owned businesses (Pacific Women, 2021).

In some APEC countries, women account for almost two-thirds of university students in tourism courses, yet they only hold a quarter of professional and managerial positions in the sector (Hamilton, 2020). In general, the tourism industry tends to be segregated by gender, with women concentrated in low-paid jobs and precarious positions and not achieving professional-level employment.

Women in coastal areas are more linked than men to the sustainable use of marine resources. Their traditional gender roles put them in daily contact with marine resources, such as mangroves, wetlands and biodiversity (OECD, 2021). They have to use these resources because they are often poor and their livelihood depends largely on them. When these resources are exploited and ruined, women suffer the most. If used wisely and sustainably, women benefit the most. Most women want to learn and be recognized for what they really are: natural resource managers. The choice to involve women is a choice for sustainability, it is a choice that will lead to sustainable use not being lost in favor of unsustainable consumptive uses.

7. Conclusion

The Blue Economy definitely leads to the achievement of SDG 14 "Life below

water”. But as this article shows, BE can contribute to practically all SDGs. It is important to highlight that the blue economy has great development potential, incorporating the latest achievements in science and technology and under a focus of constant innovation. Furthermore, we must not omit its capacity to improve the well-being of the inhabitants of the coasts, as well as promote the inclusion of women, youth and indigenous groups. APEC has issued several statements related to sustainable and low-carbon development, as well as seas and coasts. The BE can contribute decisively to the fulfillment of the Putrajaya Vision 2020 to turn APEC into an open, dynamic, resilient, inclusive and peaceful community by 2040, guaranteeing the human rights of present and future generations. Furthermore, through blue carbon it is an essential component in the adaptation and mitigation of climate change.

Also the initiatives presented in this research are recent, and their final results are not yet assessed, they are oriented to promote sustainable use and conservation of marine resources, reinforcing climate action (mitigation and adaptation). And simultaneously ensuring the well-being of coastal communities and the inclusion of women and minority groups.

Including the gender vision in the blue economy is a fundamental part of strengthening its sustainable management. There is enormous potential for women in the blue economy improving gender equality only in the tourism and fishing sectors. But much more could be achieved involving women in new areas such as sustainable aquaculture, renewable energy, blue carbon and marine bio-prospecting.

Policy changes are needed to generate a sustainable and resilient blue economy, for the benefit of communities and the 17 SDGs. Innovation and technology are needed to support the restoration and protection of oceans and coasts, which are often led by communities.

A contribution of this study is to show that the development of the blue economy is more viable within regional integration groups as APEC, where funds can be allocated to support the least developed members, and integrated coastal management plans can be performed on regional level. In this context, our research also contributes to advancing the definition of the emerging concept of blue economy, highlighting the components of cooperation and governance on regional level, which strengthen cooperation at the global level.

To conclude it is important to highlight that APEC presents important advances to promote healthy oceans and the blue economy, providing a good framework of regional cooperation that could be emulated by Asia-Pacific countries, including the regional organizations of ASEAN, Bay of Bengal, Technical Cooperation and Multi-Sectoral Economic Partnership (BIMSTEC) and Indian Ocean Rim Association (IORA), Trans-Pacific Partnership Agreement (TPP), among others.

Without a doubt, the future will depend largely on a rational use of the ocean, as sources of food, but also as a fundamental element in the regulation of climate

and rain, in the generation of clean energy, as an extraordinary vehicle of contact between civilizations through navigation, and of course as a vital space to recreate and enjoy its beauty.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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