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Research Article

Marine Renewable Energy and Economic Sustainability: Policy Frameworks for Scaling Offshore Wind and Tidal Power

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ABSTRACT

This study investigates the policy frameworks necessary for scaling marine renewable energy (MRE), specifically offshore wind and tidal power, within the context of economic sustainability. The objective is to critically examine how current policies support or hinder the expansion of MRE and to propose strategic frameworks that align environmental goals with long-term economic development. Drawing on a qualitative, comparative case study methodology, the research analyzes policy instruments and institutional arrangements in selected leading MRE countries, including the United Kingdom, South Korea, and Canada. Data sources include government policy documents, international energy databases, and expert interviews. The paper uses two theoretically related to each other concepts: ecological economics, which breaks down the interdependence between economic systems and natural ecosystems, and the policy cycle model and helps to assess the success of policy-making and its application. The value of this study is that it helps to support the filling of policy/governance gaps that inhibit the wider uptake of marine renewables. The conclusion shows that there is a need to have integrated, adaptive, and inclusive policy processes that enhance innovation by minimizing the risks associated with investments as well as equitable distribution of benefits among coastal environments. This paper provides policy recommendations that can be used to scale MRE technologies as it promotes sustainable economic results and extends on the expanding data on the policies of energy transition and blue economies.

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Introduction

The energy industry in the whole world is experiencing a radical shift as a result of the growing demand in reducing greenhouse gasses and countering the negative impacts of climate change. A transformation towards renewable energy is not only a choice anymore but a necessity in order to meet international climate targets, including those set in the Paris agreement (International Energy Agency [IEA], 2021). With the push of countries to decarbonize their economies and the potential of many countries to develop their unused and immense marine resources, the saturation of the need to develop them and the popularity of the sphere are growing. In the past, oceans have been an auxiliary part of energy production, mainly offshore (oil and gas) mining. Nevertheless, policy changes and new technologies have started to shift the discourse to marine renewable energy (MRE), which has become one of the key foundation stones in developing a more sustainable and low-carbon energy system (Kerr et al., 2020).

Energy diversification presents a unique situation in the case of marine renewable energy as the ocean-based resources are consistent and predictable. Today, offshore wind, which grew into a mature and fast-growing business in a few locations, and tidal energy, which are known to be both predictable and have a long-term outlook, are becoming an accepted source of scalable and cost-effective energy as an alternative to traditional energy sources (Esteban et al., 2021). Even though there are promising approaches to it, the implementation of MRE technologies is fraught with multiple challenges: significant capital expenditures, regulatory complexity, and the issue of environmental safety. The misfortune is that countries have not been able to scale these technologies well enough due to the lack of cohesive and future-thinking policies frameworks.

This paper explores the policy frameworks that can enable offshore wind power and tidal power scaling and the discussion examining how these policy frameworks can be deployed in facilitating economic sustainability in addition to the environmental objectives. The main research question is a narrow insight on the impact of certain policy tools, in our case, subsidies, regulatory simplification, and maritime incentives on marine sectors development and long-term viability in various national contexts. The object of the research is the determination of best practices in policy design that may translate optimally MRE technologies into practice.

This study is quite relevant to a number of stakeholders. As academic research, it would help add to the existing debate on

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ocean-based development by reconciling theoretical knowledge in the field of environmental economics, sustainable and political economy with real life research studies on the strategies of coastal nations. It complements comparative research on the national contexts of operationalizing the Blue Economy and opens up to additional transdisciplinary exploration of governance, innovation and ecological resilience. To political economy analysts, the study provides a complex grasp of the interconnection between the maritime resources and the state capacity, institutional quality and economic rent distributions. It unveils how governance systems of the ocean not only mirror pre-existing political structures of power, but also it delivers a critical eye in terms of policy performance in terms of equality and good. To trade and policy makers, the findings provide a practical approach to the setting of trade and investment policy so as to conform with sustainable ocean development. This is because as the Blue Economy continues to take centre stage as a new driver in regional integration processes and value global chains as in the case of seafood exports, marine renewable energy technologies and maritime logistics, so does the need to consider harmonized regulations, environmental protection efforts, and inclusionary trade arrangements that are supportive to the long-term economic and ecological sustainability.

Theoretical Framework

There are two major theoretical concepts that support this research including Ecological Economics and Policy Cycle Model. These frameworks provide a multidimensional perspective upon which marine renewable energy (MRE) policy can be evaluated with regard to economic and environmental sustainability in the wider context.

Ecological economics is a discipline that offers the basic understanding of interface between the economic development and environmental constraints. Ecological economics humanizes the economy by imagining it as a subsystem of the biosphere whereas neoclassical economic models abstract the environment and belong to the domain of xenology. In this framework there would be a stress on non-exhaustible ecological resource and a need that there should be a sustainable scale, fair distribution, and efficient allocation of resources.

When applied to the case of MRE, it means that the economy of offshore wind and tidal is not the only part of the picture, but also the ecological and social perspective should be considered and the sustainability and equity of the enterprise to the people. It facilitates the policy making to internalizes environmental costs, responsive renewable energy innovation and the proliferation of systemic resilience in the coastal economies.

The Policy Cycle Model provides a framework of guided pathway through the process of formulation, implementation and evaluation of a public policy (Howlett, Ramesh, & Perl, 2009). It separates the policy process into five stages; agenda setting, policy formulation, decision-making, implementation and evaluation. This model comes in handy when determining the points in which policy frameworks that relate to MRE tend to fail or prosper.

With this model, the study finds and evaluates the responsiveness of national and regional MRE policies to be effective and adaptive. It is also used to compare the manner in which other countries have addressed the challenges of scaling offshore wind and tidal power relating to political, technical and socio-economics. Compiled, these theoretical approaches would offer a holistic guide to examine the sustainability and efficacy of marine energy policy instruments and deliver practical suggestions to scaling the innovation in the area.

Literature Review

Global Perspectives on the Blue Economy

The Blue Economy concept has become very popular around the world because it is one holistic development model that incorporates all the three components of the development; economic growth, protection of the environment, and social inclusion in the marine and coastal environment. Founded at the 2012 Rio +20 United Nations Conference on Sustainable Development, the Blue Economy is characterized as an ocean-based economy focusing on aspects of sustainability, equity, and conservation of ecosystems (UNCTAD, 2021). Fundamentally, the Blue Economy is the attempt to use the countries of the sea in a way that favors sustained growth and extends to the protection of biodiversity and oceanic ecosystem. It is defined by World Bank (2017) as the sustainable use of ocean resources in the development of the economy, better livelihoods, and decent employment with maintaining the health of the ocean ecosystem. This globalism has incited a trigger towards the interests of multilateral institutions, governments and individual actors which are aiming at tapping the economic potential of the maritime sectors, that are fisheries, offshore renewable energies, maritime transport, coastal tourism and marine biotechnologies.

Regional Initiatives on the Blue Economy

The Blue Economy agenda has attracted response by various regional blocs which have developed their own strategic structures based on their distinct ecological, economic and geopolitical interests. African Union Africa Blue Economy Strategy (ABES) in Africa has five thematic areas that involve fisheries and aquaculture; renewable energy; maritime transport and trade; ecosystem conservation; and governance and institutional frameworks (African Union, 2020). ABES aims at ensuring that ocean-based development is compatible with Agenda 2063 and Sustainable Development Goals (SDGs) to focus on inclusive growth, alleviation of poverty or resilience to impending climate change.

In Europe, the European Union divided their Blue Growth Strategy into three strands namely the support of smart, close to 2013 and inclusive growth in the maritime industries in 2012. It lays more emphasis on innovation, marine spatial planning and sustainable investment in five coastal regions including aquaculture, coastal tourism, marine biotechnology, ocean energy and seabed mining (European Commission, 2017). The EU also combines its Green Deal and Circular Economy with Blue Economy, which again proves the interconnectedness of climate action and sustainability of marine nature.

ASEAN member states have started Blue Economy cooperation in Southeast Asia within regional mechanisms like the ASEAN Strategic Plan on Environment (2021-2025) and the ASEAN Working Group on Coastal and Marine Environment. Although it is still developing, the Blue Economy discourse in ASEAN has focused on ecosystem-based practices, regional fisheries management and marine-based pollution (ASEAN, 2021). Multilateral donors and regional which usually support these efforts are still facing challenges in implementation as a result of institutional fragmentation and lack of capacity among, and between member states.

Empirical studies conducted on Blue Economy have studied the input that Blue Economy adds to the economy particularly the growth in the gross domestic product, employment rates, and export achievements. As an example, the analysis indicates that the ocean-based industries add more than 1.5 trillion per year to the global economy and may increase 2-fold by 2030 when managed sustainably (OECD, 2016). According to Moyo and

Songwe (2020), in Africa, small-scale maritime fishing and trade is the core of livelihood and regional integration.

At the social level, Blue Economy provides means to increase gender equity and community resilience, especially those along the coast and on islands. But there is a warning that unless there is inclusive governance, Blue Economy policy processes can increase inequality, or side-line long-standing users like artisanal fishers (Bennett et al., 2019).

Environmental reviews identify all these factors that necessitate a combination of ocean governance to curb the challenges of overfishing, destruction of habitats, and ocean pollution. Marine spatial planning, ecology-centered administration, and marine ensured spaces are over and over focused on as important specialists to counterbalance financial action with living limits (Goncalves et al., 2021).

Case Studies of Policy Frameworks

Offshore Wind Power:

United Kingdom Policy Evolution, Market Mechanisms, and Economic Impacts

The United Kingdom has become one the first world to go offshore with wind energy, mostly because of their innovative policy mechanisms. In 2014, the UK substantially changed its strategy related to renewable energy by the introduction of the Contracts for Difference (CfD) scheme. CfDs give the developer long-term price certainty as it offers an electricity generated price as a fixed strike price to limit the market risks (Department for Energy Security and Net Zero, 2023). This has drawn significant investments hence the offshore wind capacity has been growing very rapidly.

Economic effects of these policies are worth mentioning. A report on socio-economic benefits of offshore wind in 2016 Ghorbani Pashakolaie, et al. (2025) estimated that £4.52 billion is the socio-economic value of offshore wind which is less than the costs of CfD payment which is estimated to be 7.15 billion. The benefits attributed to this are emission savings, jobs creation, and effects brought by trade.

The CfD auction system has played a very crucial role in reducing the expenses of offshore wind ventures. Through this competition that allows developers to compete, the scheme has resulted in substantial strike price reductions across the rounds of auctions (Department for Energy Security and Net Zero, 2023). The modern issues have however appeared. To give an example, Ørsted canceled the construction of the 2.4 GW Hornsea 4 project due to the problem of increasing prices and supply chain tightening (Pratley, 2025). This is the reason why responsive policy designs are necessary in order to meet the challenges in the market and guarantee sustainability to offshore wind power.

China:

State-Led Strategies, Industrial Policy, and Supply Chain Development

The Chinese model of offshore development can be described as highly interventionist and strategic industrial policies. Offshore wind is regarded as one of the important elements of the energy transition strategy by the government in reducing the dependence on fossil-fuels to achieve energy security (International Energy Agency, 2011). The specified policies, including the "Guidance Catalog of Industrial Structure Adjustment", gave preference to the offshore wind technology and manufacturing equipment locally, as a result, they have considerably improved the national possibilities in a short period of time (Zhang et al., 2022). This has seen China build an end-to-end supply chain on offshore wind energy, including manufacture, installation and maintenance services.

Although this progress has been made, there are a number of environmental and regulatory factors in China that occur in expanding offshore wind capacities. EIAs may be cumbersome and lengthy processes, and as such, they may hold up the project (Zhang et al., 2022). As well, large-scale offshore wind projects need substantial infrastructure changes and coordination of regulations in order to integrate into the existing power grid. Such issues are essential prerequisites to the sustainable growth of offshore wind in China.

Tidal Energy

France: Historic Leadership and Policy Stagnation

France is old in tidal energy, and the La Rance Tidal Power Station, commissioned in 1966, was the world first and, successively, the largest tidal power station (Wikipedia, n.d.). Although this was an early step to lead the country in tidal energy production, there was a stagnation in the country until several decades ago, where little development led. Nevertheless, recent initiatives point to a revival of interest. An investment of 65 million Euros approved by the French government to boost the FloWatt tidal energy project is one step into breathing life back into the sector (Ocean Energy Europe, 2023).

The La Rance project offers great lesson on long-term operation and maintenance of tidal power plant. It proves that f the tidal energy, the part of a constant-stable power supply based on renewable resources may be fulfilled. The recent uptake of pilot initiatives such as FloWatt indicates that the French government is attempting a policy change that leads to the adoption of new technologies in the fields of tidal generation, and their incorporation into the overall energy policy.

Canada:

Role of Provincial Policy

Nova Scotia is the lead province in Nova Scotia in tidal energy development efforts in Canada. The Marine Renewable Energy Act also gives a regulatory list of how to license and govern the tidal power projects. The Fundy Ocean Research Centre for Energy (FORCE) is a research and demonstration centre where the collaboration of the government, industry, and academia is made possible (Government of Nova Scotia, 2025).

In spite of supporting policies and regulations, issues are being faced. Developers have to deal with a complicated procedure of approvals that entails a variety of federal and provincial agencies and may result in longer delays and prices (Department of Fisheries and Oceans Canada, 2024). Another important issue is community involvement. The Acadia Tidal Energy Institute highlights the role of the local communities in project developments and decisions making to enhance trust and create the social license to operate

Challenges in Marine Renewable Energy and Economic Sustainability:

Policy Frameworks for Scaling Offshore Wind and Tidal Power

Policy and regulatory complexity are one of the main barriers that exist to the scaling of offshore wind and tidal power. The two sectors are largely reliant on formulation and implementation of clear, consistent and enabling policies. Many systems are also often piecemeal, sporadic or still developing in many areas, and this absence of regulatory certainty will often put investors off.

To use an example, in the United Kingdom, Contracts for Difference (CfD) tool has stimulated offshore wind development

but critics of the policy design indicate that the government policy does not fully respond to the dynamically changing market environment, such as an increase in material prices and constraints within the supply chain (Pratley, 2025). Additionally, in China, although the offshore wind industry is currently well-supported by state policies, red tape does not only exist in the form of environmental impact assessment (EIA) and delays but also serves as a drag on the growth of the offshore wind business (Zhang et al., 2022).

Although both offshore wind and tidal power are environmentally sustainable, the development of these can also lead to the occurrence of following environmental and social challenges which should be hence nullified through proper policy frameworks. As an illustration, the offshore wind farms have been condemned due to the possible effects of the offshore wind farm on the biodiversity of the marine life, especially migratory birds, as well as on the fishing communities of the nearby locations who are likely to experience interference in their livelihoods (Bennett et al., 2019). Policy solutions should thus focus on biodiversity, on conservation of habitat and on local communities.

Tidal power is still more complicated in this respect, because it means the distortion of the natural course of the tides and the flow of waters, which may have the impact in the local ecosystem. Ecological impacts of certain stations such as the Rance Tidal Power Station in France have resulted in the plans of large-scale tidal energy developments being questioned due to its lack of environmental protection (Goncalves et al., 2021). The regulation of such technologies should involve environmental screening and community participation stipulation so that the environmental and societal costs of developing such technologies would not be disproportionately pushed on to nature and those who live in nature.

The technologies of both offshore wind and tidal energy experience high technological hurdles. As an example, offshore wind power plants demand extensive infrastructure as well as turbines technology which are overcome by engineering as well as logistical issues which involve placing, maintenance and power conveyance. In the case of tidal power, the technology is maturing even less, and it has high initial capital expenses to install, as well as technical problems connected to the long-lasting activity of the turbines in rough marine conditions (Zhang et al., 2022).

Besides, grid connection is still a major obstacle to the two sectors. The offshore generated power must be fed to on shore grids, which are sometimes located miles away. The capacity of infrastructure to such massive transmission varies greatly in numerous areas, and modifications to the grid to accommodate renewable energy inputs commonly take a lot of time and money (Hughes & Harar, 2021). This insufficiency of infrastructure may slow down or hamper the massive initiatives of MRE projects.

Deploying offshore wind and tidal power is a capital-intensive venture and cash may not be easily found, particularly in areas where renewable energy markets have not been developed. Offshore wind installations and tidal power projects are risky investments to the private firms mainly due to their high capital investment hitches and payback period. Although such schemes as CfD in the UK offer price stability, they are commonly accused of failing to adequately fund unmanageable risks associated with developing offshore energy (Pratley, 2025).

The offshore wind and tidal power industry also meet considerable barriers when it comes to social acceptance. The approval of renewable energy projects may be delayed or aborted due to local resistance which is regularly linked to visual effects, noise pollution and possible interference with fisheries. In areas with large fishing populations, like some parts of the UK and Canada, the issue of renewable energy development confronts them with issues of access and even destruction of fishing grounds and concern by local fishermen (Bennett et al., 2019).

The importance of stakeholder engagement can hardly be overestimated. Open, participatory and inclusive policy designs are instrumental in reducing social confrontation and development of community goodwill on big-scale renewable energy projects. Effective participation guarantees that societies can be involved in project design and delivery and allows integrating economic and environmentally related objectives with the interests of the locals.

Prospects and Opportunities in Marine Renewable Energy and Economic Sustainability

Among the major opportunities of expansion of offshore wind power and tidal power is the fact that technology is constantly advancing, lowering costs and boosting efficiency. Specifically, offshore wind technology has experienced tremendous advances in designing turbines, such as creating larger turbines that use higher energy and costs less (Hughes & Harar, 2021). Floating offshore wind farms may be installed in larger depths as the turbine sizes grow and new technologies related to floating wind farms are innovated, with new markets and possibilities available to the previously unexploitable areas (Salter et al., 2021).

Offshore wind and tidal power have important potentials on economic growth. By 2030, there is an anticipation that the UK offshore wind industry will create up to 40,000 new jobs on its own (Department for Business, Energy & Industrial Strategy [BEIS], 2023). The development of the marine renewable sectors, such as the rise of supply chains related to the manufacture of turbines, their installations, and servicing, will create direct as well as indirect jobs in the entire area (Bennett et al., 2019). This employment creation is not only in areas that require specialized persons but also cut across the community such as in logistics, tourism and maintenance.

Besides, the economic virtues of expanding offshore wind and tidal power are not only associated with creating employment but also the new source of revenues through exporting technologies, services, and knowledge. As an example, Denmark has become a powerful player on the market of wind turbine manufacturing and is set to become a main shareholder in the world market of offshore wind (Hughes & Harar, 2021). Other nations, such as China and India, with their powerful manufacturing foundation are quite possible to develop and penetrate into the marine renewable energy market by investing in the technology development and implementation (Zhang et al., 2022).

Environmental sustainability of marine renewable energy is one of the best present opportunities. The energy of offshore wind and tides can help to reduce carbon emission, thus directly helping to achieve climate change mitigation plans globally. Based on the points reported by International Energy Agency (IEA) (2022), offshore wind power has the potential to provide the global market with up to 20 percent of its total power demand by 2040, contributing to substantial decrease in the use of fossil energy sources. Also, tidal energy provides a reliable and stable type of energy, which can be used to supplement variable renewable power sources such as wind and solar to increase grid stability (Salter et al., 2021).

At the social level, marine renewable energy developments are contestably gaining prominence to empower coastal communities through availing of clean locally generated energy, which can save on energy costs and enhance energy security (Bennett et al., 2019). As an example, Nova Scotia tidal energy projects have been strongly supported by local population, which envisages the opportunity of energy independence and sustainable growth (Government of Nova Scotia, 2025).

As awareness of the significance of sustainable development and Blue Economy grows, a large number of governments are beginning to design forwarded policies that promote the development of marine renewable energy. To scale up offshore wind and tidal power, EU Blue Growth Strategy, to name but one, offers funding possibilities, technological as well as market incentives (European Commission, 2020). This policy framework provides a good platform on cross border collaboration of EU member states on building marine renewable energy.

On the same note, the determination of China that they will achieve a carbon neutral status by 2060 has developed huge opportunities of expanding offshore wind and tidal power. Recent clean energy development policy priorities by the Chinese government give particular attention to offshore wind as an essential element of future energy mix (Zhang et al., 2022). Here, the public-private partnership (PPPs) may be a significant contributor to both innovation and implementation without losing economic benefits (Hughes & Harar, 2021).

The investment in marine renewable energy shall rise significantly with the growing government and the private sector investment in decarbonization. Sustainable investment funds and green bonds are being allocated to marine renewable energy projects in greater numbers, and this is supplying the finance needed to develop these developments on a larger scale (Salter et al., 2021). Specifically, offshore wind is the area that brought billions of dollars of investments, with major international companies, including Orsted, Equinor, and Copenhagen Infrastructure Partners, leading offshore wind farm development around the world.

Besides, there are financial instruments, such as Contracts for Difference (CfD) in the UK or feed-in tariffs (FiTS) in other nations, which can be used to ensure stable returns to investors. Such policy incentives play a very essential role in the commercial viability of marine renewable energy technologies, especially, their initial stages of deployment (Pratley, 2025).

The main distinctive difference between marine renewable energy especially offshore wind and tidal power is that they have the potential to integrate with other renewable energy sources, including solar energy and on-shore wind farms. There is a possibility of using offshore wind farms to complement the onshore wind energy system since wind patterns do not always match in both areas, thus continuously generating power when the production of wind energy at the onshore wind energy system is low (Bennett et al., 2019). Such a synergy enables a more balanced generation of energy, and it makes renewable energy sources more reliable and gives great stability to the grids.

Key Findings and Discussion

Blue Economy has demonstrated great promise of leading sustainable economic development and the four major areas that have made remarkable contributions to the national economies are the offshore wind, marine biotechnology, aquaculture, and tourism. In Norway, marine renewable energy industry and offshore wind energy leading therein are likely to diversify the Norwegian energy industry and support its aspiration of attaining carbon neutrality by the year 2050 (Hughes & Harar, 2021). In the same fashion, Mauritius has mobilized its biodiversity in the oceans to cultivate the sectors of sustainable tourism and aquaculture which have helped the nation hold up economic stability even when the global economy is exposed to turbulences (Ramjee, 2021).

They have a significant role in the Blue Economy development where sound governance is of high importance. States like Norway have implemented proper governance mechanisms that have made using the marine environment sustainably without balancing the environment with economic growth (Ministry of Climate and Environment, 2022). The regulatory frameworks which are consistent with international standards and promote the use of partnerships between the government and the business are needed in order to promote innovation and investment in marine-related industries (Bennett et al., 2019).

Blue Economy pursuit is not without challenges particularly on environment trade-offs. Although industries such as offshore wind energy and aquaculture have the potential to lower the dependency on fossil energy considerably and offer food security, negative consequences to the environment can arise unless the industry is governed with care. As an example, offshore wind farms and their construction can interfere with marine life and biodiversity, and excessive levels of aquaculture can cause eutrophication and destruction of the habitats (Salter et al., 2021).

The Indonesian case demonstrates that community-based management systems can effectively assist in the promotion of environmental resilience and the fact that it does not provide the local communities with the sustainable use of resources (Fahmi & Basyuni, 2021). Such practices with scientific studies can help in the development of resilience to the effects of changing climatic conditions like ocean acidification and sea-level rise.

One principle of the Blue Economy is to target equity and inclusivity in marine resource access. This includes solving social and economic imbalances that might come up in the process of sea resources over-exploitation or when they are owned by a small group of players. In Mauritius, the distribution of the gains of the Blue Economy was attempted through induction of local communities in the decision-making process concerning sustainable tourism and fisheries management (Ramjee, 2021). Such participatory methods have made sure that the marginalized communities and coastal communities who largely depend on marine life in terms of livelihood access to such benefits of the Blue Economy.

Gaps in Existing Comparative Studies of Coastal Nations

Despite the expanding literature, significant gaps remain in comparative analyses of how coastal nations interpret and implement the Blue Economy. Much of the current research is either sector-specific (e.g., fisheries or tourism) or geographically limited to single-country case studies. There is a relative lack of cross-national studies that evaluate institutional designs, policy coherence, and development outcomes across different coastal contexts. Moreover, existing evaluations often focus on national strategies without adequately considering subnational governance, local community participation, or the role of informal economies.

Additionally, while theoretical models have been proposed to link Blue Economy initiatives with sustainability goals, few studies rigorously assess the causal relationships between policy frameworks and their economic, social, or environmental impacts. This gap limits the ability of policymakers to draw evidence-based lessons from other jurisdictions. Thus, there is an urgent necessity of comparative, interdisciplinary and policy-related studies, which could investigate the enabling conditions, constraints and results of Blue Economy adaptation in various coastal countries.

Summary, Conclusion, and Policy Recommendations

Summary

There is a huge potential in the Blue Economy to advance economies through using the marine resources to provide energy, food security, and economic diversification. By creating new industries such as offshore wind, tidal energy, aquaculture, and marine bio-technology, nations can not only sever their

dependency on fossil fuels, maintain food security, and improve the resilience to climate change. A solid, flexible, and sustainable policy framework regulating such activities should be in balance between economic profit generation and environmental health (Bennett et al., 2019; Hughes & Harar, 2021).

This paper has discussed patterns of governance, issues and potential of Blue Economy using cases of Norway, Mauritius, and Indonesia as examples. The strategies of these countries provide optimal lessons on the role of regional cooperation, innovation on technology, and community-based management in the exploitation of marine resources with the idea of enhancing economic and environmental sustainability.

Notwithstanding these advances, central issues remain, such as inefficient regulation, trade-offs involving the environment, financing shortages and equity issues. To resolve such challenges, the nations have to increase the level of policy coherence, promote the idea of public-private partnership, and invest in capacity building at the local/national level.

Conclusion

Building a Blue Economy is a process that needs to be planned wisely, communicated, and thought strategically in the long-term perspective. Although portentous achievements have been recorded in the implementation of sustainable use of marine resources, the combination of governance frameworks, technological advancements, as well as regional integration will play an exceedingly crucial role in the full potentials of marine sectors. With economic, social, and environmental aim integration, nations have the opportunity to optimize their Blue Economy without endangering risks.

The relaxing of the offshore land wind energy in Norway, the sustainable tourism and aquaculture development in Mauritius as well as community-based approach to marine resource management in Indonesia all evinced winners in how viable Blue Economy policies can be developed to address the local demands and the global sustainability agenda. Nevertheless, there is still a lot to be done to advance regional cooperation and coordination of policies across the globe, as Blue Economy is still disunified.

In order to achieve the potential of the Blue Economy, the priorities of countries should focus on sustainable governance models, financing, capacity building, and collaboration at regional and international levels. It will be a way of making sure there is an equal sharing of marine resources harvest and preserving the environment to benefit future generation.

Policy Recommendations

- Governments are advised to develop coherent national forces that incorporate the offshore wind energy and tidal into wider energy, maritime and climate policies.
- Ease and streamline the permitting and licensing with other agencies procedures to cut red tape.
- Introduce long term support systems including feed-in tariffs, contract-for-difference (CfD) and green bonds and loan guarantees to de-risk the investment in offshore wind and tidal power.
- Encourage local production, training and research and development, by supporting policies that stimulate local capacity development.
- Use MSP tools to designate priority zones for MRE projects while balancing ecological conservation and other marine uses.
- Encourage knowledge exchange, joint research initiatives, and harmonization of technical standards through regional alliances and international platforms (e.g., IRENA, IEA-OES).

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