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The Blue Economy–Cultural Livelihood–Ecosystem Conservation Triangle: The African Experience

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The concept of Blue Economy (BE) is recognized as central for sustainable development that incorporates socio-economic benefits and ecological conservation. However, in Africa, much of the emphasis on BE is placed on economic gains; as a result, traditional livelihoods and small-scale local operations are outcompeted by international corporations and government initiatives, with little or no regard for social inclusion and environmental sustainability. We argue that successful BE initiatives in Africa accentuate the involvement of local communities and promote sustenance of the natural ecosystem. We define success in terms of the sustainability balance among ecological, social and economic aspects. Drawing on extensive expert experiences, observational data and literature review of case studies across the African continent, we highlight two critical findings. First, large scale BE initiatives prioritize economic gains at the expense of environmental degradation and the exclusion of local communities. Second, using the full spectrum sustainability (FSS) evaluation, we show that successful BE interventions considered ecological, economic, socio-cultural and institutional objectives. Drawing on these case studies, we propose the adoption of a collaborative framework which amalgamates the top-down and bottom-up approaches to BE management. Achieving the goal of successful blue growth in Africa is now even more challenged by the implications of COVID-19 on the BE sectors. Reimagining and rebuilding a resilient BE in Africa post-coronavirus will require a strong political commitment to promoting a balance between economic, social and environmental benefits in line with the African Union's Agenda 2063 and the United Nations' Sustainable Development Goals.

Keywords: Agenda 2063, collaborative blue management, ecosystem conservation, social equity, ocean economy

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INTRODUCTION

"Blue Economy" or "Oceans Economy" is increasingly being proposed by scholars and policy makers as a useful concept for conserving the world's ocean and the inherent resources (UNECA, 2016, 2018; Au-Ibar, 2019; Wenhai et al., 2019; Lee et al., 2020). Rapidly resonating with many countries, demonstrated by its prominent positioning on national development agendas, the

concept of the Blue Economy (BE) was first highlighted at the United Nations Conference on Sustainable Development held in Rio de Janeiro in 2012 (UNCTAD, 2014). At the backbone of the BE lies the need for "improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP., 2015) thus placing the society, economy and environment at the core of the discourse.

Recent work by Wenhai et al. (2019) examines various definitions of BE using global case studies and summarizes it as a "macro-economy" concept that encompasses "every aspect of national and global governance, economic development, environmental protection and sustainability and international communication." Further, some key players view BE as a blueprint for promoting economic development along with ecological conservation aimed at poverty reduction (AU, 2015; UNECA, 2016). For example, the concept of BE was defined by The World Bank United Nations Department of Economic Social Affairs (2017) as "comprising the range of economic sectors and related policies that together determine whether the use of oceanic resources is sustainable."

The United Nations Conference on Trade and Development (UNCTAD) defines BE as the economic and trade activities that focus on the ocean-based marine environment, associated biodiversity, ecosystems, species, and genetic resources whilst ensuring conservation (UNCTAD, 2014). While multiple players acknowledge the role of BE in socio-economic development and environmental sustainability, inherent complexities exist in its interpretation despite the urgent need to transition to a more sustainable blue growth pathway which addresses threats to the environment and economic and human security (Voyer et al., 2018a; Okafor-Yarwood et al., 2020). BE is mostly divided into economic, environmental, and social components with the aim of bringing the three categories together. However, the economy is often given priority in policies and development debates whereas environmental conservation and social equity are often marginalized. This holds true for many African states where the idea of the BE often appears to be restricted to generating revenue by any means necessary from a capitalistic viewpoint, with very little, if any, consideration for the benefits to local communities or environmental conservation (Masie and Bond, 2018; Childs and Hicks, 2019). It is imperative to incorporate the needs and concerns of local communities in the conception and implementation of current and future BE projects as their contributions will be central to achieving social equity and reducing environmental risks. As such, we define a successful BE in the African context as one that emphasizes the interconnectedness of economic development, local community inclusion and environmental sustainability without prioritizing one aspect over the other.

In Africa, while blue growth makes substantial contributions to the economy through various sectors, the potential of BE has yet to be fully recognized (UNECA, 2016). The prospects of BE to influence Africa's economic growth was first highlighted in the African Union Integrated Maritime Strategy (AIMS) 2050 (AU, 2012; Adewumi, 2020) and advanced with the adoption of the African Charter on Maritime Security and Safety and Development in Africa (or the Lomé Charter) by the African Union Assembly in 2016 (AU, 2016). As set out by the African Union's Agenda 2063, the BE is perceived as the continent's future because its benefits extend beyond the shores of coastal states and create opportunities for adjacent landlocked communities and countries (AU, 2015).

The goal of BE parallels the guiding principles of the green economy which center on "improved wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP., 2015). In Kenya, for example, the Green Economy Strategy and Implementation Plan (2016–2030) emulates these guiding principles by promoting a low-carbon, resource-efficient and inclusive socio-economic transformation (Government of Kenya, 2016). Kenya is not an exception as many African states have increasingly mainstreamed green economy strategies into institutional performance targets (Georgeson et al., 2017). These experiences are being applied in the implementation of the BE. However, blue growth in Africa remains mostly unattainable as sustainable exploration of the sea is undermined by inadequate knowledge and technological capacity, combined with limited investment in the BE sectors. With this in mind, it becomes clear that African nations will not develop what they do not understand and therefore blue growth becomes even more elusive and remains at the subsistence level of our ancestors.

Nevertheless, some strides have been made in selected sectors of Africa's BE, which currently contributes an annual value of US$1 trillion to Africa's economy (UN, 2020). The fisheries sector makes a significant contribution to the food and income security of millions of Africans (De Coning and Witbooi, 2015). The sector contributed $US24 billion, or 1.26% of the GDP of all African countries, in 2011 (de Graaf and Garibaldi, 2014). However, the ability of Africa's fisheries to contribute to the sustainable development of its people is undermined by overexploitation, including illegal, unreported and unregulated (IUU) fishing by local and distant water fishing vessels (Carney, 2017; Belhabib et al., 2020; Okafor-Yarwood and Belhabib, 2020). de Graaf and Garibaldi (2014) estimate that 25% of all the marine catches in the continent are made by non-African states, resulting in the loss of US$3.3 billion potential earnings, which in turn may impact food and economic security. This is a significant amount when compared with the US$0.4 billion earned by African countries from fisheries agreements without taking into account the US$2.3 billion lost through IUU fishing in West Africa alone (de Graaf and Garibaldi, 2014; Doumbouya et al., 2017; Grun, 2019; Okafor-Yarwood, 2019). To meet the growing demand for food and economic security, African states are increasingly investing in aquaculture (Harris, 2011; Chan et al., 2019; Obiero et al., 2019). Compared to global figures, Africa contributes the least of any continent to total global aquaculture production, yet the continent's aquaculture sector is growing faster than anywhere in the world, and accounts for 8% of the 12.3 million Africans employed in the fisheries sector (Obiero et al., 2019).

Further, Africa's rich oil fields and the prospects for offshore discoveries have transformed it into an important player in the global oil production and resource extraction. Four coastal states, Algeria, Egypt, Nigeria, and Libya, possess 91.5% of the continent's proven oil reserves. However, Africa's hydrocarbons are predominantly extracted by international

corporations and most of the crude oil is refined outside the continent. Consequently, the benefits do not always stay in the host communities and there is little regard for environmental sustainability (Okafor-Yarwood, 2018; Okafor-Yarwood et al., 2020). Nigeria and Angola, the first and second largest oil producing countries in the continent, import over 80% of their fuel due to lack of domestic refineries (Steffani, 2011; Ogbuigwe, 2018; Graham, 2019). The quest for harnessing the resources in their marine environment is also driving non-oil producing states on the continent to explore offshore hydrocarbons, with Senegal and Mauritania set to join the league of oil producing states by 2022 (EIU, 2019) and Mozambique to follow by 2024 (Zawadzki, 2019).

Maritime transportation and shipping is another promising sector in the continent. The sector was developed at an exponentially increasing rate by European empires in the mid-nineteenth century, making it possible to exploit their colonies (Debrie, 2012; Bickford-Smith, 2016). The maritime transportation and shipping sector continues to play a vital role in the continent's trade such that over 90% of Africa's imports and exports are conducted by sea (AU, 2012). Despite the large volume of trade via the sea, the continent only accounts for 2.7% of global trade value, 7% of global seaborne trade and 5% of maritime import and export by volume (UNCTAD, 2018). With the launching of the operational phase of Africa Continental Free Trade Area (AfCFTA), investment in relevant infrastructure would create jobs for Africans and facilitate intra-Africa trade. Today, this accounts for only 17% of African exports, compared to Asia and Europe's 59 and 69%, respectively (Cloete, 2019; Chimbelu, 2019).

The continent's diverse marine ecosystems, consisting of beaches, coral reefs, and wildlife among others, presents untapped tourism opportunities that would support local economies while advancing conservation. Small island nations such as Seychelles, Cabo Verde, and Mauritius derive 62, 43, and 27%, respectively, of their GDP from the tourism sector (UNCTAD, 2017) which signifies the importance of investing in this sector for socio-economic development. Notably, the lack of investment in relevant infrastructure, and security threats at sea such as piracy and armed robbery, have hindered the advancement of the tourism sector in West, Central, and East African regions (UNEP and WIOMSA, 2015; Okafor-Yarwood, 2020).

Finally, marine renewable energy is increasingly growing on the continent. The presence of the Indian and Atlantic Oceans provide an opportunity to exploit enough energy to meet the demand for electricity on the continent (UNEP, 2011). The prospect of Ocean Thermal Energy Conversion (OTEC) in Africa dates back to 1956, with an initial attempt of a 3MW open-cycle plant for Abidjan, Côte d'Ivoire (Cummins, 2011). African countries may have viable OTEC resources within their 200-Nautical Mile Exclusive Economic Zones (Asian Development Bank, 2014; IRENA, 2014). In addition, the capacity of Africa's wave energy is estimated at 3,500 Wave Energy TWh/yr (Smith et al., 2011; Hafner et al., 2018) and many countries are keen to explore ocean energy. For example, Ghana has installed and operationalised a wave energy array with 400 Kilowatt (KW) of capacity, while South Africa has identified a coastal spot for the Stellenbosch Wave Energy Converter (SWEC) (World Energy Council, 2016). Governments in Africa have signed Memoranda of Understanding (MoU) with several leading renewable energy project development firms to design their OTEC capacity (Grad, 2014; NIOMR, 2020). However, while blue power generation gives a promising picture for Africa's BE, limited progress has been made to actualise the vision of a continent powered by blue energy, thus challenging the process of upscaling the BE.

Recognizing the significance of BE as the "next frontier" for Africa's development in its Agenda 2063 of the "Africa we want," the African Union (AU) declared that the Blue Economy is "Africa's Future" (UNECA, 2016). The AU declaration aligns with the global development plans, through Goal 14 of the Sustainable Development Goals (SDGs) 2030, which focuses on life below water specifically "to conserve and sustainably use the world's oceans, seas and marine resources" (UN, 2016). By developing a successful BE, Africa's coastal and island nations will be a step closer to achieving SDG 14, which is strongly connected to other SDGs (Okafor-Yarwood, 2019; Obura, 2020).

Managed properly, the BE is key to ensuring the sustainable development of the African people by 2063. However, one inherent problem noticeable in the monitoring, benefits sharing, and implementation of projects related to the ocean economy is the top-down management approach which often leads to further exclusion of coastal communities (Sowman et al., 2011; Gaymer et al., 2014; Sowman and Sunde, 2018; Isaacs and Witbooi, 2019) resulting in limited economic input into local economies and destruction of traditional livelihoods (Pereira, 2011; Belhabib et al., 2020; Okafor-Yarwood and Belhabib, 2020). Given the dependence of coastal communities on marine resources, stakeholder conflict often arises between development, industry, government and communities (Kadagi et al., 2020). There is also a lack of human and financial resources for monitoring which increases the risk of development paying little to no attention to environmental degradation due to emphasis on generating revenue (Okafor-Yarwood, 2018, 2019; Belhabib et al., 2020).

The literature is replete with approaches for addressing challenges arising from the management of natural resources, especially in relation to coastal and fisheries governance. Much of these studies have proposed frameworks pointing to the need for an integrated approach that combines the top-down and bottom-up approaches (Christie, 2005; Curtin and Prellezo, 2010; Fulton et al., 2014; Butler et al., 2015; Jones and Stephenson, 2019; Stephenson et al., 2019b). Though more emphasis is given to the ecological objectives and less on the economic, social, cultural and institutional facets (Jones and Stephenson, 2019; Stephenson et al., 2019a), these guiding principles can be a useful tool for assessing the outcome of BE projects as either successful or unsuccessful, through the lenses of their ecological, economic and social outcomes (Curtin and Prellezo, 2010; Benson and Stephenson, 2018).

Our paper sets out to address two critical objectives: (i) assess the performance of government, corporate and community blue initiatives against societal, economic and environmental

metrics, and (ii) propose a collaborative engagement framework that can guide and support the development of the African BE that combines the top-down and bottom down blue management approaches.

MATERIALS AND METHODS

To examine successful BE in Africa, we defined important gaps in the context of our own experiences and knowledge. The paper drew on experiences and discussions between co-authors who found that most examples of BE initiatives in the continent failed to prioritize ecological sustainability, and social equity, thus excluding the needs of coastal communities.

We do not aim to produce a comprehensive evaluation of ecological, economic and social equity for BE initiatives in Africa, but this may be a recommended approach for assessing the success of current and future BE interventions. This would also involve something that is beyond the scope of this work: a thorough analysis of case studies taking into account a complex variety of information sources which are not necessarily accessible to the general public, involve different scales, the time frame of a given BE initiative, contexts and applications. We instead make use of published literature, reports, observational data and extensive expert experiences to examine perceived success in light of the BE objectives. Despite the limitations of the ethnographic observation method, such as bias in the analysis of data, the method allows the researcher to study people in their native environment, understand things from their perspective and learn things that the observed might have been unwilling to discuss in an interview (Baker, 2006; Clark et al., 2009; Bryant, 2015).

Success was defined in terms of the sustainability balance among ecological, social and economic aspects. We adopted the full spectrum sustainability (FSS) approach described by Jones and Stephenson (2019) (**Table 1**) to express balance or imbalance. We selected various African case studies which are well documented with information from a variety of accessible sources and compared them using a desktop FSS framework. We then matched indicator information mentioned in the literature with sustainable objectives and allocated either a tick for a mention and overall positive perspectives, a cross for mentions and negative perspectives or NM for "no mention" (**Supplementary Table S1**).

Following our evaluation of unsuccessful and successful projects, we explored three types of management approaches to recommend possible blue governance frameworks that integrate local communities.

In the remainder of this section, we examined unsuccessful and successful community-based and government-led BE interventions which allowed us to critically review and recommend possible frameworks for participation of coastal communities. Following the review of existing literature, we adopted the integrated or collaborative management approach described in various studies (Schelhas et al., 2001; Butler et al., 2015; Keen et al., 2018) as the outcomes aligned with the FSS and our argument for a successful BE in Africa.

AN ASSESSMENT OF BLUE PROJECTS IN AFRICA

An estimated 25 percent of Africa's population live 100 km within the shoreline (Celliers and Ntombela, 2015). The figure is much higher in West and East Africa, where over 40% of the population lives in coastal areas (Obura et al., 2017; Okafor-Yarwood, 2019). Given the significance of the marine environment and the resources that lay beneath it to the livelihoods of the African people, one of the biggest challenges to a sustainable BE would be achieving a balance between inclusivity, ecological conservation and economic development.

Ocean-based development activities related to Africa's BE range from community-based enterprises to large scale initiatives operated by governments and private sectors. Our evaluation of various BE case studies based on the FSS approach is twofold. First, we use examples to demonstrate the characteristics of unsuccessful BE which focuses on economic gains against the backdrop of ecological conservation and social reciprocity for local communities who struggle to achieve general wellbeing (**Figure 1**). Second, we highlight successful examples of BE projects that incorporate the FSS approach (**Figure 1**).

Unsuccessful BE Examples

Recognizing that blue growth is a crucial factor in Africa's new economic paradigm, we argue that development initiatives must account for the potential implications arising from the exclusion of community needs and social objectives. For example, selected BE projects have led to the displacement or extinction of fishing communities along the coast. In addition, the expansion of the offshore oil and natural gas sector through exploration and new infrastructures combined with pollution and climate change may further diminish marine fisheries, especially where there is a lack of coherent and effective governance frameworks (Okafor-Yarwood et al., 2020). Some examples of the challenges faced by local communities are explored in the ensuing case studies.

Port of Kribi Project, Kribi, Cameroon

The Government of Cameroon embarked on infrastructure development in the maritime and shipping sector to enhance the national economy and improve the livelihoods of coastal communities. One example of such commitment is the Kribi deep-water port project, recognized among China's biggest port investment projects anywhere in the world, the largest deep-water port in West Africa, and aimed at easing congestion to the harbor in Douala (EIU, 2017). While the investment in the Kribi Port would bring about economic development in Cameroon, it comes at a huge cost to coastal communities and the environment. In particular, the 300 inhabitants of Mbode in Lolabe, whose village had to be destroyed for the port to be built, received little or no compensation for their land (Schenkel, 2018). In addition, the clearing of the forest in the project areas has implications for local biodiversity, as it has resulted in the direct loss and the fragmentation of ecosystems (Romain et al., 2017).

The people affected, many of whom are fishers and farmers, have lost their traditional fishing grounds and farmlands, and

TABLE 1 | Summary of full spectrum sustainability (FSS) for assessment of BE activities in Africa, adapted from Jones and Stephenson (2019).

Full-spectrum sustainability category	Sustainable objectives	Example indicators
Ecological	Productivity and trophic structure	Recruitment dynamics, indigenous knowledge
	Biodiversity	Species assemblage structure, biodiversity indicators, indigenous knowledge
	Habitat and ecosystem integrity	Pollution, habitat restoration, ecological indicators, indigenous knowledge, maintenance of ecological services
Economic	Viability and prosperity	Human demographics, capacity building, technical assistance
	Sustainable livelihoods	Livelihood index, financial empowerment, ownership
	Distribution of access and benefits	Equity, the inclusion of marginalized groups, women, youth and indigenous communities, ownership
Social and Cultural	Health and wellbeing	Social factors, social development, quality of life
	Sustainable communities	Social capital, social structure
	Ethical practices	Rights of people, respect for indigenous practices and traditions
Governance and Institutional	Legal and policy support	Legal support for indigenous people, favorable people-centered policies
	Governance structure	Organized groups, multi-sectoral involvement, the involvement of indigenous people
	Cooperation and accountability in decision process	Collaboration, accountability, the involvement of indigenous people, use of indigenous knowledge

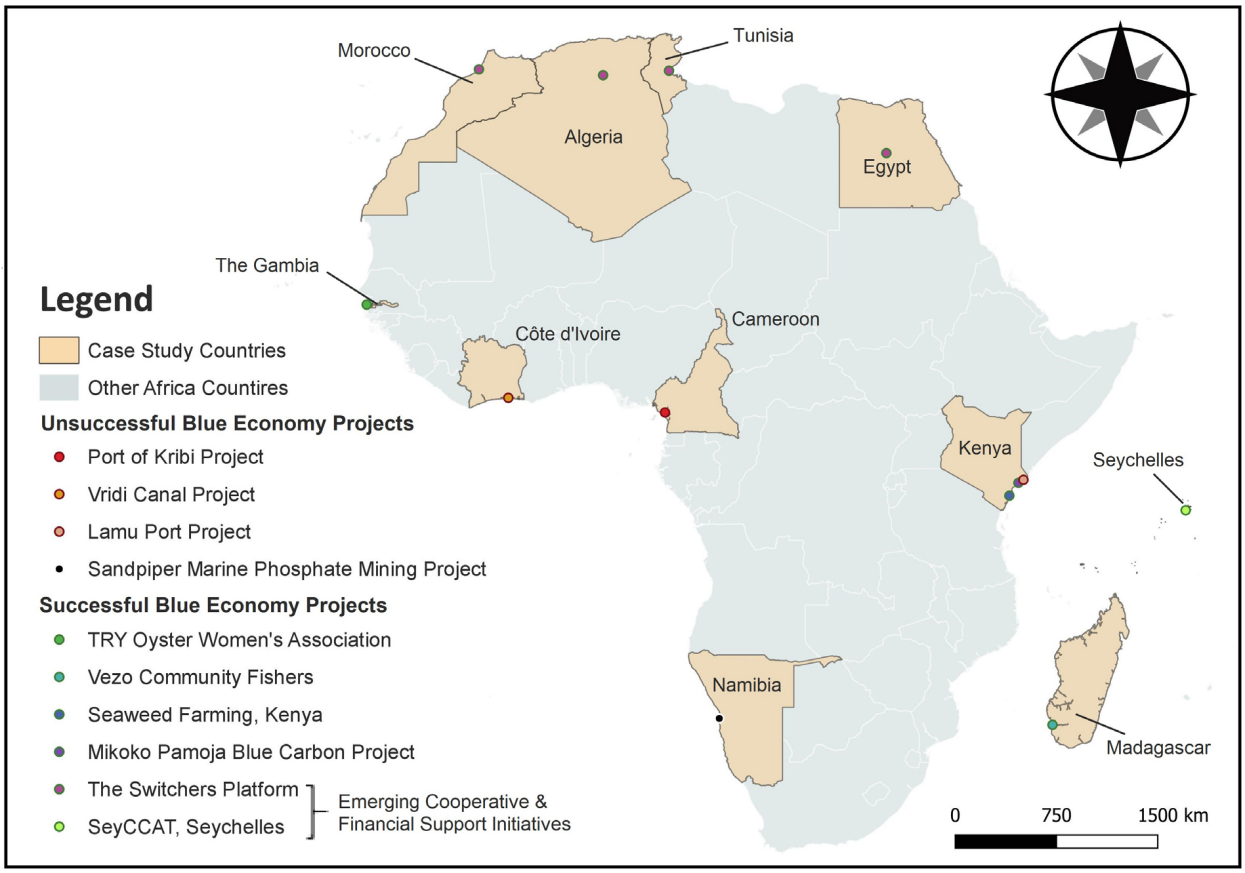

FIGURE 1 | Map of Africa, with Figure citation for the case study areas highlighted.

must now invest in expensive fishing equipment to fish elsewhere and/or seek an alternative source of livelihood. It has been reported that the villagers affected by the Kribi Port Infrastructure development were compensated and a special town built for them (Benkenstein, 2014). In reality, the promise of a better life has eluded many of the villagers, as they note that they struggle to make ends meet in their current location. Some members of the Mbode village have noted that though they were compensated, the compensation was far from what was initially agreed with the government, especially concerning land allocation, provision of housing and other basic amenities such as water and electricity (Okafor-Yarwood et al., 2020). They further claim that since the process of relocation started in 2011, nothing concrete has been achieved and many members of the community have relocated to different parts of the town, rather than the proposed site which is far removed from the comfort they once enjoyed (personal observation by I.O-Y).

The general view is that community members had hoped that the investment in the Kribi Port infrastructure would improve their socio-economic wellbeing, which has not been the case. Instead, they have lost their farmland, traditional fishing grounds and their ancestral homes. For the women, the eviction from Mbode means that they no longer have access to the lands they once farmed, or get as much fish to sell, since their husbands have either abandoned the fishing trade out of frustration or are not catching as much as they used to (personal observation by I.O-Y).

The narrative is similar in other communities across Lolabe. In Batanga, residents were displaced from their ancestral land and relocated to a different site some 6 km away, without any provision or consideration for the ancestral graves and other sites of social and cultural significance (Assembe-Mvondo, 2019). Also, the deforestation induced by the development project has destroyed other human habitats such as the Bagyeli and Baka indigenous people in rubber plantation sites, with livelihoods, places of worship and other cultural activities of pygmy populations destroyed with no regard for social safeguards (Assembe-Mvondo, 2019; Pemunta, 2019).

Though the Kribi deep seaport and the infrastructure associated with it would boost the Cameroonian economy when completed, the impact of the project in contributing to environmental degradation and depletion of the natural forest must not be ignored (Romain et al., 2017). The impact of the Port project on the Congo Basin, home to the second-largest tropical rain-forested area on earth (Tyukavina et al., 2018) calls for serious concern. Specifically, the cutting of trees began in late 2010, and by the time the project will be completed in 2035, it is projected that tens of thousands of hectares of the jungle will be cleared (Bax, 2018). The impact on the Congo Basin is worth highlighting due to its significance for biodiversity, serving as a home to important species including the critically endangered Pangolin and Lowland Gorilla (Tyukavina et al., 2018; Nforngwa, 2019). Deforestation associated with the felling of trees for the construction of the Port infrastructure, such as roads, threatens biodiversity. It exposes already endangered habitats to many threats, as they become easily accessible to poachers.

The completion of the Kribi deep water port in 2018 has led to further deforestation as there is now access to some of the most sought-after wood for the Asian market. In May 2018, a single Vietnamese ship was said to have loaded an estimated 10,000 cubic meters of wood from the Port of Kribi, which is an estimated 450 trucks load of logs (Colgan, 2018). During a visit to Kribi in October 2019, it appears the deforestation has increased substantially, as over 50 truckloads of logs were counted en route Yaoundé to Kribi (personal observation by I. O-Y).

Ultimately, the port infrastructure provides an opportunity for local development, as well as improving the economy of Cameroon. However, the implications for biodiversity, cultural preservation and the livelihood of the communities also have to be taken into account. In particular, given the Congo Basin's "role in regulating rainfall patterns across other parts of the continent, [the] continued [deforestation] could exacerbate insecurity of freshwater and food supplies for some of Africa's most vulnerable populations" (Bergen, 2019). One thing that must not be ignored, therefore, is the potential for such development projects to result in further animosity against the central government, something that Cameroon and its neighboring state, Nigeria, have experienced over the perception of political exclusion and unequal economic development in Anglophone Cameroon and the Niger Delta of Nigeria, respectively (Okafor-Yarwood et al., 2020).

Unfortunately, the narrative of the unsustainable approach to blue projects highlighted in Cameroon is replete across the African continent. For example, coastal communities are forcefully evicted or face eviction in Angola, Garside and Burke (2020) Kenya, Njunge (2019), Senegal, Grun (2019), and Guinea-Conakry, Philippe (2019), which brings about increased uncertainty due to the loss of traditional fishing grounds and ancestral homes, to make room for real estates, roads and port infrastructures respectively.

Vridi Canal Project, Abidjan, Côte d'Ivoire

The narrative is similar in Côte d'Ivoire, where the expansion of port infrastructure in Abidjan, through the widening of the Vridi canal, has negatively impacted communities living adjacent to it. The Vridi canal has been expanded and deepened from the previous maximum draft of 12 m and a Twenty-foot Equivalent Unit (TEU) capacity of 3,500 to a draft of up to 16 m and 10,000 TEU capacity. The project, which started in 2015 and was inaugurated in 2019 (Budd Group, 2019; Port Authority, 2019) is aimed at accommodating more container ships, improving the maritime transport and shipping industry, and thereby transforming the Port of Abidjan into a major maritime transport hub in West Africa (Kobri and Dosso, 2019).

The surrounding areas of the Vridi canal have been hit by coastal erosion which is attributed to the cumulative effect of climate change (Addo et al., 2011; Zamblé, 2011; Sink, 2016; Dahir, 2017; Kemper, 2017; Vitousek et al., 2017). However, some local residents explicitly associate the recent coastal erosion with human causes, in particular the expansion of the Vridi canal. The residents note that the enlargement of the canal led to the diversion of sea currents to the eastern part of the canal, causing destruction of homes, places of worship and businesses. Although residents have been urged by the government to move away from the coast to avoid being affected by future erosion events, they

claimed that they have received little to no support from the state to rebuild their homes and businesses (personal observation by I.O-Y). While there are no current scientific studies that link the expansion of the canal to the recent erosion, previous studies connect human activities to erosion in the Abidjan area. In fact, scholars have linked previous coastal erosion to the construction of the Vridi canal in the 1940s. Odada (2013) argues that beach erosion on the east of Vridi canal has intensified since its opening in 1950. Similarly, Abe and Affian (2012) show the construction of the canal, which began in 1943, resulted in the accumulation of sediment[1] on the western part and the erosion of the Port-Bouët coastline (which is located in the eastern part) by up to 3 m per year. The coastal retreat induced by the port facilities has severe consequences on livelihoods, as it leads to the destruction of properties and reduction of constructible space (N'Doufou et al., 2015).

The expansion of the Vridi canal and the resulting modernization of Côte d'Ivoire's port would bring about economic development and perhaps an improvement of the welfare of coastal communities. At the same time, the project exposes the countries' population to environmental risks, and loss of livelihoods. The cost of coastal degradation in Cote d'Ivoire in 2017 was estimated at US$2 billion, close to 5% of the country's GDP (The World Bank, 2019) which counteracts any economic gains made from the development of coastal infrastructure should coastal degradation continue to escalate. Therefore, coastal states must ensure that the impact of future BE initiatives are assessed to incorporate the views of coastal communities, especially those likely to be affected by such developments. In essence, we argue that future BE initiatives should consider adopting the FSS approach, which takes into account the ecological, economic, socio-cultural, government and institutional perspectives.

Lamu Port Project, Kenya

The Government of Kenya initiated the Lamu Port Project in 2012 to provide a transhipment hub for the East Africa region (Wël, 2012; Nduire, 2018). The project is one of the key components in the Lamu Port South Sudan Ethiopia Transport (LAPSSET) corridor which consists of the construction of 32 Deep Sea Berths and several infrastructures, originating in Lamu, intended to link East, Central and North Africa. The LAPSSET corridor is identified as an integrative infrastructure priority for East Africa Community (EAC) Vision 2030. It includes several highway roads, a causeway, and an oil pipeline between Lamu Port and Kenya's Oil Fields in Turkana Basin, and a standard gauge rail network that connects the Southern Agricultural Growth Corridor of Tanzania (SAGCOT), and the Maputo Development Corridor (MDC) (Kabukuru, 2016).

The port, which is currently not fully operationalized, was designed to ease the congestion in transportation and improve Kenya's connection with its landlocked neighbors, thereby boosting Kenya's regional and global competitiveness in the transhipment business. However, some local residents have raised an alarm over their lack of involvement in the planning and implementation process. Other reports point to the lack of sensitization of communities on the effect of the Lamu project on their socio-economic wellbeing (Sena, 2012). While fishing is important to the food and economic security of communities in Lamu, several reports denote a decline in the number of fishing grounds due to dredging activities which negatively impact livelihoods. In addition, the dredging has altered the diversity of fish species and the ecosystem at large. Destruction of habitats such as mangroves and coral reefs have been reported. In 2018, for instance, the court ruled that more than 4600 fishers would be affected by the LAPSSET project stating that:

> "Murky waters due to [the] effects of dredging and the destruction of the coral reefs and mangrove forests, have already affected the population and location of the fish" (Njunge, 2019).

This is true as many residents have raised concern about the decline in fish catches as noted by a 46-year-old fisher:

> "I used to get 40 kilogrammes in one catch but since the exercise started, I cannot get even 15 kg. The fishmongers don't want to understand when you raise the price because they will tell you they have the option of buying cheaper imported fish" (Njunge, 2019).

The loss of fishing grounds combined with decline in fish catches is likely to undermine the livelihoods of Lamu residents who have a long history of fishing. The Lamu Archipelago, particularly Old Town Lamu which dates back from the 14th century, has been known as a tourist destination and was designated as a UNESCO World Heritage Site in 2001 (Njunge, 2019).

Several residents have also highlighted the implications of Lamu Port for the surrounding habitats and resources, including far-reaching ecological, cultural, economic and social destruction. Activities such as sand mining and dredging for the port contributes to destruction of the ecosystem as stated by a 47-year-old dhow maker and snorkeling guide:

> "The water around where we used to take tourists for snorkelling started becoming dusty after the dredging started and the coloured fish species disappeared" [...] You either take them deeper in the ocean, which is very dangerous, so most of them opt not to snorkel in Lamu" (Njunge, 2019).

A 2019 court ruling instructed the Kenya Ports Authority (KPA) to pay the fishers US$17 million in compensation to be made within a year. However, KPA appealed the ruling resulting in the suspension of the compensation (Business Reporting Desk, 2019). This example points out to the inherent complications of such developments which fail to meet the expectations of the communities.

Though the Lamu Project presents an example of a BE initiative poised to enhance global shipping, the negative externalities borne by the communities may outweigh the benefits. As the Kenyan coastline is changing to accommodate

[1]Sedimentary accumulation is a natural process that involves the long-term deposition of sand to the shorelines/beaches to make up for the amount lost by erosion (Szmytkiewicz and Zalewska, 2014).

such large-scale infrastructure, innovative methods of compensation need to be developed to ensure that communities are not left impoverished by such projects. There is an urgent need for African states to initiate adequate monitoring programs to identify the impacts of current and future BE projects in a timely manner. Monitoring and evaluation require enforcement of regulatory and policy frameworks to ensure the environment and people are not adversely disadvantaged at the expense of economic development.

The Sandpiper Marine Phosphate Mining Project, Namibia

The Namibian government authorized the mining of phosphates within its EEZ in 2011 in an area believed to be the largest identified marine phosphate deposit in the world (NAMPHOS, 2012). The project aimed to push Namibia as a global market front-runner in rock phosphate production, with an envisaged steady-state production of three-million tons a year of phosphate concentrate product over an initial mine life of 20 years, including a 2-year ramp-up period (Odendaal, 2020). It is estimated that Sandpiper Marine Phosphate Mining would generate N$730 million (∼US$40 million) a year while fully operational (Odendaal, 2020).

However, the project, led by the Namibian Marine Phosphates (Pty) Ltd. (NMP), has not been in operation since 2012 because of a lack of transparency as well as concerns about serious impacts on the marine environment and the fisheries. Specifically, the proposed exclusion zone of 23 × 9 km would impact key commercial fishing grounds for hake, horse mackerel and monkfish which would have serious effects on livelihoods and environmental conservation (Midgley, 2012; Mensah, 2017; Menges, 2018). In an October 2012 press release, the founder of the World Future Council, Jakob von Uexkull, voiced concerns about the future of Namibian fisheries should the planned Sandpiper marine phosphate mining project be allowed to go ahead (World Future Council, 2012). He posited:

> "The risks of the project are incalculable and potentially devastating, as it is the first time phosphate would be mined at sea anywhere in the world. Application of the precautionary principle is critical in this instance if we are to protect our oceans."

Despite many concerns raised by activists and environmentalists over the years, Namibia's Environmental Commissioner in September 2016 gave out an environmental clearance certificate to NMP to commence mining operations (Immanuel, 2016). Following the issuance, three associations representing the Namibian fishing industry launched legal action against the commissioner for granting the environmental clearance certificate, resulting in the reversal of the award certificate in November 2016 (Shapwanale, 2016). Since then, there has been a back-and-forth legal tussle between the NMP and the Namibian authorities with no lasting solution in sight.

The prospects of this project to Namibia's economy may be far-reaching, however, it expedites environmental degradation and undermines livelihoods. Further, the associated impacts on the environment and conflicts between stakeholders is a critical precursor to the success for the Sandpiper Marine Phosphate Mining project as an example of developing the BE. Thus, calls attention to power imbalances that exist in the top down approach to BE management whereby the contributions of local stakeholders are rarely considered.

Balancing community needs, cultural preservation, and ecological function is a growing challenge in the quest for a successful BE for many states (Roberts and Ali, 2016; Keen et al., 2018). Though some efforts have been made to draw attention to the competing interests in exploring the economic potential of oceans, community needs are increasingly marginalized from decision-making processes (Bennett, 2018; Pauly, 2018). Therefore, addressing Africa's 'next frontier' for economic development must prioritize features of social equity and environmental sustainability. A successful BE framework presents a viable opportunity for many communities that rely on ocean resources as a source of livelihoods and food security but faces the risk of poor and disjointed governance efforts which underrate the importance of communities (Bennett et al., 2019; Roy, 2019).

Neglecting to consider community needs jeopardizes human, social, economic, and cultural security, and therefore undermines inclusivity and sustainable development as discussed in the aforementioned case studies. What the foregoing discussion suggests is that the increasing failure to acknowledge the role of local communities within the African BE debate leads to a stand-still in socio-economic development as evidenced in the examples presented above. We assert that the mainstreaming of the BE agenda with community needs requires a process that challenges the normative governance and economic mindset which isolates ecological sustainability and the needs of local resource users. Imbalances in power dynamics as exhibited in top-down management often leads to the marginalization of local communities in the decision-making process, which accelerates the potential for conflicts (Voyer et al., 2018b; Kadagi et al., 2020; Lee et al., 2020; Okafor-Yarwood, 2020).

The Niger Delta provides a prime case study that underscores the immediate and long-term implications of excluding the interests of local communities since oil exploration started in the 20th century (Obi and Rustad, 2011). The alliance between the government and multinational corporations has mostly focused on maximizing and protecting oil revenues while paying little attention to the under-representation of communities and environmental conservation in the Niger Delta (Maiangwa and Agbiboa, 2013; Okafor-Yarwood, 2018). This has fuelled a rise in militant groups who claim to represent the needs of communities, resulting in conflict between the oil multinational corporations and the state, as well as insecurity that has extended to neighboring countries (Onuoha, 2013; Obi, 2014; Ali, 2015; Oyewole et al., 2018; Okafor-Yarwood et al., 2020) threatening the economic development of the entire region.

The Niger Delta example highlights the implication of adopting a management framework that fails to consider the connection between the BE sectors and the SDGs. Primarily, the BE sectors contribute significantly to the SDGs: income (SDG 8) from the sale of fish (SDG 14) addresses food and nutrition security issues (SDGs 1 and 2), pays for health care and education

(SDGs 3 and 4), and reduces inequalities (SDG 10) (Un General Assembly, 2014; Okafor-Yarwood, 2019; Obura, 2020). The SDGs epitomize the United Nations pledge of "no human left behind," emphasizing the need to address imbalances in attaining the collective benefit to the economy, society, and environment (Un General Assembly, 2014; Okafor-Yarwood, 2019). The negative impact of the BE projects on local communities cast doubt on the ability of countries to attain the related SDGs by 2030. If the BE cannot offer real benefits to the local people, maintaining the monolithic approach to benefit sharing will increasingly prove difficult. Thus, the integration of local communities in the BE paradigm is required to address the short-comings and allow social inclusivity and engagement.

Undoubtedly, blue growth is underpinned on a resource base which is susceptible to human-driven changes such as increased pollution, alteration of coastal ecosystems and overfishing which limits the ability for ocean resources to contribute to the realization of the SDGs and the AU's Agenda 2063 of the "Africa we want." Yet, the discussions about issues of ocean development are mainly centered around economic motives with less consideration for the communities in the management or co-management of those resources. Success in the BE calls for the participation of coastal communities to ensure that social contracts are of mutual benefit to all stakeholders (Boutilier and Thomson, 2011; Bennett et al., 2018). Achieving success would require transparency in the management of BE and building the capacity of communities to leverage the field for multiple stakeholders.

In the remainder of this paper, we explore the successful community-based and government-led BE interventions which allow us to critically review and recommend possible frameworks for the management of BE projects in Africa.

Successful Blue Economy Examples

The first global conference on the sustainable BE was held in Kenya in 2018. The purpose of this conference was to contribute to a successful ocean economy. Its thematic session on an inclusive BE is of particular relevance as it presents a vision of what success may look like from the perspective of local communities (SBEC, 2018). Successful examples of BE in Africa tend to be people-centered and work to overcome the marginalization of women, youth, and indigenous communities. Successful examples also incorporate co-management models that enhance ownership, participation, and mutual benefits among stakeholders, build knowledge and technical capacity, accelerate financial empowerment, and use indigenous knowledge (SBEC, 2018). Using the FSS approach as a measure for success and authors' extensive experiences, we outline some well-documented projects that demonstrate key lessons for the success of BE in Africa.

TRY Oyster Women's Association, the Gambia

In the Gambia, the community of Karmalloh started the TRY Oyster Women's Association (TRY) in 2006, which eventually became an NGO linked to The Gambia-Senegal Sustainable Fisheries Project (Ba Nafaa) (Lau and Scales, 2016). In 2012, TRY became the first women's association in Sub-Saharan Africa to be granted exclusive use rights to a fishery under the Cockle and Oyster Fishery Co-Management Plan for the Tanbi Wetlands National Park, between the Gambian Department of Parks and Wildlife, the Department of Forestry, the National Environment Agency and the Department of Fisheries. TRY aimed to address the "connected challenges of unemployment and coastal degradation" (UNDP, 2013). It has led to reduced pressure on the mangrove environment and increased cooperation between groups of oyster harvesters and in turn has contributed to the reduction of tensions among local groups and integration of migrant communities (Lau and Scales, 2016). Success in this example was partially attributed to (i) building trust and confidence among stakeholders, (ii) consultation among women harvesters at local to national level, (iii) integrated programmes that delivered tangible short-term benefits while making progress toward achieving longer term goals, and (iv) adaptive management based on indigenous knowledge and other scientific approaches (UNEP., 2015).

Vezo Community Fishers, Madagascar

In 2004, the Vezo community of fishers, a small isolated and poor community in southwest Madagascar, created a locally managed BE initiative that addressed the need for a sustainable octopus fishery, given the general decline in catches (Langley, 2006). The establishment of locally managed marine areas (LMMAs) was supported by government policies which allowed local communities to use traditional laws and indigenous knowledge to govern temporarily through measures such as permanent closures which resulted in the recovery of octopus stocks (Cripps and Gardner, 2016). Blue Ventures, the Wildlife Conservation Society, World Wide Fund for Nature and the Madagascan Marine Research Institute provided necessary technical and material support to enable local management. Early involvement of seafood export companies, Copefrito and Murex, was also critical as they became the main buyers of octopus and paid a premium rate for stocks from temporary closures, thus supporting the value chain and sustainable management of the fishery. This example shows that fishers, private sector seafood companies, government and non-governmental agencies can work together to successfully manage natural resources, resulting in the sustainment of livelihoods, economy and biodiversity (Westerman and Benbow, 2013; UNEP., 2015; Cripps and Gardner, 2016).

Mikoko Pamoja, Kenya

Mikoko Pamoja (Mangroves together), based in Gazi Bay in Kenya, is the first mangrove Payment for Ecosystem Services (PES) project in the world which seeks to restore and conserve mangroves, degraded by years of legal and illegal cutting, through the sale of carbon credits. The community received technical support in restoration of the mangrove forests and also in carbon quantification through scientists from the Kenya Marine and Fisheries Research Institute (KMFRI) in Mombasa. The project is accredited by the Plan Vivo system and standards to trade in 3000t CO_2. Mangroves are referred to as Blue Forests and they have been documented to contain six times the carbon sequestration potential of terrestrial forests (Huxham et al., 2015;

Huff and Tonui, 2017). Mangrove forests also offer additional ecosystem support services such as the provision of nursery grounds for important fish species and coastal protection services (Huff and Tonui, 2017; Murungi, 2017; Das, 2020).

Under this project, about 117 hectares of natural and planted mangrove forests are under a co-management regime where communities safeguard the forests and its resources. The carbon credits produced by the project are sold on the international voluntary carbon market through a charity known as the Association for Coastal Ecosystem Services (ACES). The carbon verification is done through Plan Vivo. Benefits from the credits are used to support various community needs in the Gazi village (Huff and Tonui, 2017).

The Mikoko Pamoja blue carbon project is run by the community based Mikoko Pamoja Community Organisation in partnership with the KMFRI and in collaboration with Earthwatch[2]. Since its inception in 2014, this community-led initiative incorporates mangrove rehabilitation and PES to ensure co-management and benefits sharing. This project provides a successful example of cooperation between multiple stakeholders including the local communities, state agencies, and non-governmental organizations (Huff and Tonui, 2017; Murungi, 2017).

An important aspect of this endeavor is the fact that it provides financial benefits for conservation and the work is currently promoting the national dialogue for inclusion of blue carbon from mangroves in the Kenyan Nationally Determined Contributions (NDCs). According to the Africa Blue Economy Strategy, NDCs form an essential component of the BE (Au-Ibar, 2019) and projects such as these lend themselves to providing conservation benefits and securing critical areas of biodiversity even as the drive for large developments are promoted by African governments.

Seaweed Farming, Kenya

In 2001, seaweed farming started out as an experiment to determine site suitability for the growth of commercial seaweeds in Kenya (Wakibia et al., 2006). The aim of the work was to explore the potential of seaweeds as a possible means of improving the livelihoods of local villagers. The village of Kibuyuni, in the south coast of Kenya, was one of the study sites and seaweed farming has taken root in this community. Technical support was provided through the Kenya Marine and Fisheries Research Institute (KMFRI) under the World Bank-funded Kenya Coastal Development Project (KCDP) which improved the efficiency of seaweed farmers (Nyundo, 2017). Seaweed farming is linked to the provision of income generating and employment opportunities for the community. A better education for the children of farming families is also one of the benefits related to higher incomes (Personal observations by NIK and JU; Mirera et al., 2020; Odhiambo et al., 2020). In addition to economic gains, community members note that the development of seaweed farming has paralleled the conservation of mangrove forests through planting of hundreds of mangrove seedlings hence improving the health of fish stocks by providing refugia and breeding grounds (Personal observations by NIK and JU; Mirera et al., 2020; Odhiambo et al., 2020).

The farming is mostly undertaken by women and the process is moving toward commercialization with over 50 farmers participating in the project (van Wyk, 2015; Hurtado and Msuya, 2017; Walker, 2018; ODINAFRICA, 2020). The Kenyan Blue Economy Committee in 2019 provided support for value addition to produce branded juice, salads, soaps, and shampoos from this unique ocean product. One of the aims of such ventures is to promote value addition and enhance benefits to coastal livelihoods through establishment of processing plants (Wells et al., 2010; Msuya et al., 2014). The provision of production energy for such plants is a critical factor for upscaling village-level industries that seek to exploit the BE. The demand for energy is on the rise and this is shown by the electrification efforts in African nations (Au-Ibar, 2019). A large proportion of these nations depend on hydroelectric power, which is increasingly being impacted by climate variabilities leading to a renewed focus on sustainable blue energy in the form of wind, wave and tidal energy as well as algal biofuels (Elegbede et al., 2017).

This case study provides a template to accentuate the importance of involving local communities through capacity building and partnerships with government institutions such as KMFRI. The availability of training ensures that communities gain adequate skills relating to the production of better-quality seaweed. In reference to the FSS approach, the seaweed farming in Kenya shows that not only are communities internally motivated to diversify their livelihoods but they are also taking responsibility for environmental sustainability as evidenced by the conservation of mangroves.

Emerging Cooperative and Financial Support Initiatives

There are also examples of cooperative and financial support initiatives which aim to directly benefit small and micro enterprises run by local communities. Seychelles is a leader in BE development and has established funding streams for small businesses which are also aimed at individual citizens. The Seychelles Conservation and Climate Change Adaptation Trust (SeyCCAT) influences the way in which funds are distributed across Seychelles, through a competitive grant process aiming to "support the design and implementation of sustainable-use marine protected zones; empower the fisheries sector with robust knowledge and capacity to improve governance, sustainability, value, and market options; and nurture new business models to secure the sustainable development of Seychelles' fisheries"[3]. In the Mediterranean region (Tunisia, Egypt, Algeria, Morocco), The Switchers platform[4] started within the framework of the EU-funded SwitchMed programme (2012–2018) and was developed by the Regional Activity Centre for Sustainable Consumption and Production (SCP/RAC) which acts under the Mediterranean Action Plan, an organization that belongs to the United Nations Environment Programme. In 2019, Switchers became an independent initiative aiming to

[2]https://earthwatch.org

[3]https://seyccat.org

[4]https://www.theswitchers.eu

provide support services to individuals and small businesses in an effort to "contribute to sustainable and fair consumption and production models" of "green and circular businesses," and this led to the development of the Switchers Support Programme which provides a variety of services including support for business model development and for access to finance[4]. These examples show that support initiatives which are designed to become independently run by local communities tend to become successful. The success of these initiatives may depend on (i) their ability to deliver clear benefits for career development of individuals, particularly through blue entrepreneurship involving small and micro enterprises, (ii) their production practices, and (iii) their alignment with fair and environmentally sustainable consumption. However, as these initiatives progress, more information needs to be collected from a variety of sources, including from affected individuals and communities, in order to make adequate assessments.

FRAMEWORK APPROACH FOR A SUSTAINABLE BLUE ECONOMY

To achieve a successful BE, African states need to work on enhancing the political will to support the institutional capacities for economic growth and environmental responsibility while mutually reinforcing social inclusion. Given the contributions of marine resources, and the impact of depleting resources on livelihoods, integrating watershed management and collaborative networks would go a long way in reconciling coastal demands, protecting critical habitats and promoting the resilience of coastal residents.

The management of marine and coastal resources in the context of BE entails three approaches: the top-down, the bottom-up or the collaborative approach.

The terms "top-down" and "bottom-up" as used here imply formal authority and community resource users, respectively, while collaborative is the combination of the top-down and bottom-up approaches (Sievanen et al., 2011; Gaymer et al., 2014; Butler et al., 2015). These frameworks can potentially provide the basis for attaining the promise of a successful BE that is inclusive and accommodates ecological sustainability. In view of the FSS approach as the basis for a successful BE in the African continent, the ensuing sections explore the top-down, bottom-up and collaborative blue management frameworks to make a case for why current and future BE initiatives should consider approaches that meet the FSS criteria for success.

Top-Down Blue Management

Top-down blue management considers a vertical resource management approach that begins from the top, the governmental level, down to the community level. This is also known as a single-sided organizational structure used for conserving and managing environmental resources (Basco-Carrera et al., 2017). This kind of blue resources management leads to centralized planning and control by non-local communities, particularly the government, with little to no involvement of local resource users in the planning and implementation stages (Simane and Zaitchik, 2014). The one-sided power dynamics usually allows the enforcement of national and international policies and agreements without the presence of local communities as effective contributors to the decision-making process (Simane and Zaitchik, 2014).

Implemented correctly, the top-down management approach can be a useful tool for creating widespread and immediate changes, primarily because the government is central to instituting behavioral change through policy implementation and enforcement. The establishment of a larger open ocean marine protected area is a classic example of the top-down approach working as a standalone tool for achieving a broader marine conservation objective (Jones, 2012; Gaymer et al., 2014). While top-down blue management may have good intentions for local communities, there are similarities in the unsuccessful examples where there is an inherent failure to empower marginalized individuals and communities. Bridging the social gaps between stakeholders and the resources across different levels of governance is required as noted in the FFS evaluation (**Supplementary Table S1**) and our examples of unsuccessful BE initiatives in Africa. Three critical points on the setbacks of a top-down blue management require highlighting. First, high-level or central interests which are largely focused on economic gains and limited social and environmental responsibility may not align with the immediate needs of local communities (e.g., food, income, shelter, and education). Second, central governance may prioritize profit gains with minimal emphasis on the sustenance of the natural resources compared to local communities which constantly interact with their environment and embrace voluntary stewardship and conservation. Third, emphasis on central governance of blue resources is likely to encounter conflicts between resource users and multi-level stakeholders which often leads to a failure to improve livelihoods and worsening ecological sustainability as highlighted in examples of unsuccessful BE projects.

Bottom-Up Blue Management

In contrast, bottom-up blue management, as viewed by many, can be a viable alternative that allows local communities to be actively involved in the decision-making process and management of marine resources (Butler et al., 2015; Chen et al., 2020). The formalization of community involvement in environmental management is driven by past failings of "top-down" approaches which gave less attention to active community participation (Fraser et al., 2006; Gaymer et al., 2014).

As Chavis and Wandersman (1990) suggest, community-based approach to development is vital for "improving the quality of the physical environment, enhancing services, preventing crimes, and improving social conditions." Failure to engage the community can in turn undermine the overall quality of the environment and result in instability. This is true for the Niger Delta region where the failure to bring about social equity and ecological sustainability in the development of the hydrocarbon industry has driven select community members to illicit activities such as pipeline vandalization and kidnapping/armed robbery at sea undermining environmental sustainability and state security

(Okafor-Yarwood, 2018, 2020). It should be noted that the authors do not propose a bottom-up blue management as an alternative to the functions and role of the government. Instead, we posit that active engagement of communities is central to the sustainable use of ocean resources in line with previous studies that emphasize participation of communities in the development of long term, proactive and localized social innovations (Simane and Zaitchik, 2014; Mackenzie et al., 2019).

The bottom-up blue management approach can work as a standalone solution to conservation whereby adoption of policies can be influenced through behavioral change, in that individual actions can have a massive effect when embraced by a large number of people. Importantly, the participatory process whereby all stakeholders are equally involved in the policy development and implementation allows them to take ownership of the process (El Asmar et al., 2012). The TRY Oyster Women Associate initiative in The Gambia discussed in section 3.2.1, exemplifies the significance of the bottom-up approach to a successful BE, whereby social equity and ecological sustainability are achieved through community effort.

While the bottom-up approach is critical to achieving a successful BE, the top-down contributions from the state in the form of institutional contributions is equally important (Baker and Mehmood, 2013) especially in the African context. Two drawbacks may arise from a focus on bottom-up blue management. First, communities may fail to integrate the contributions of higher-level decision making which may limit diverse experiences, knowledge and expertise to improve the design, implementation and scaling-up of BE initiatives. Second, power constraints arising from a lack of centralized decision making in the bottom-up management can impede access to resources such as funding opportunities which may undermine the robustness and sustenance of BE initiatives. Given these complex interactions within top-down and bottom-up blue management systems, consideration should be given to the amalgamation of both approaches in the development of African's BE as will be discussed in the ensuing section.

Collaborative Blue Management

This framework entails the integration of the top-down and bottom-up approaches. It involves multi-level actors and stakeholders in the process of the BE development, from goal-setting to evaluation of the outcome, and in turn, bridges the gaps between top-down or bottom-up approaches (Schelhas et al., 2001; Butler et al., 2015; Keen et al., 2018). The collaborative approach can be time-consuming and expensive to implement (Bodin, 2017). In some cases, collaborative blue management can be challenged by limited assurance on the long-term engagement of multi-level stakeholders and divergence of interests which make it difficult to meet the common goal (Hind et al., 2010; Bodin, 2017). However, collaborative management provides a sense of belonging and ownership, eliminates mutual misunderstandings and creates transparency in resource sustainability practices (Vodden et al., 2005; Keen et al., 2018; Støttrup et al., 2019). These traits seem to be missing in the current discourse on BE as depicted in the various examples of unsuccessful BE.

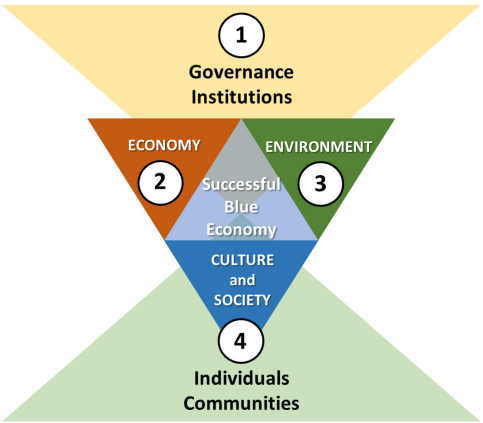

FIGURE 2 | Representation of the blue economy triangle (comprising culture and society, economy and environment); the top-down policy-driven and bottom-up community-led approaches needed for a successful blue economy; and the four key components of sustainability: (1) governance and institutions, (2) economy, (3) environment, and (4) culture and society.

In line with Wagner and Fernandez-Gimenez (2009); Bodin (2017) the authors agree that the collaborative approach does not lead to automatic success in the management of resources. Therefore, for BE initiatives to be deemed successful, they must achieve tangible outcomes and address ecological, economic, socio-cultural and institutional objectives as shown in **Table 1** and **Figure 2**. It follows that for the collaborative approach to be successful in the context of Africa's BE, then, it must give voice to the local communities and provide necessary education and capacity building which is critical for their participation. Additionally, factors such as the scale and impact of a particular blue project must be considered to allow managers and the relevant stakeholders to enforce regulations and monitor the progress.

Now more than ever, the devastating disruption of the Novel Coronavirus (COVID-19) on the socio-economic outlook of the BE sectors across the globe provides an excellent opportunity for coastal states in Africa to rebuild their BE as a source of economic recovery and resilience in case of future pandemics (UNCTAD, 2020). Re-imagining a BE for African states post-COVID-19 urgently calls for a renewed sense of awareness and recognition that achieving a successful BE in the African context requires inclusiveness and social equity considerations to deliver economic and environmental governance outcomes. In light of the potential for African states to realize recovery and resilience, we emphasize the use of the FSS evaluation in the current and future BE initiatives.

CONCLUSION

The paper has reviewed eight case studies of BE projects across the African continent. The findings from unsuccessful BE projects show that while the governments of the respective countries have the right intentions about developing their ocean

economies, emphasis is placed predominantly on economic outcomes, with limited attention given to social equity and ecological sustainability. Our evaluation of the successful community- and government-led case studies based on the FSS approach underscores the significance of multi-sectoral involvement in achieving ecological, economic, socio-cultural and institutional objectives.

Examining the performance of BE initiatives in Africa along with identifying applicable governance frameworks is critical to realizing the overall goal of current and future BE projects. We show that incorporating the top-down and bottom-up blue management approaches is central to strengthening economic development while considering social equity and ecological conservation. Recognizing the complexities in the collaborative management framework, we emphasize the need for capacity building and education to facilitate the involvement of local communities.

Our work contributes to the African BE discourse through the adoption of the FSS evaluation as a measure for the performance of BE initiatives. This provides a structure for African states, private and public institutions to assess the key indicators for ensuring the success of current and future BE initiatives. Our emphasis on the adoption of a collaborative blue management approach creates a recipe for multi-level engagement that has greater potential to spearhead a successful African BE. There is a lesson to be learned about the interconnectedness between African communities and nature based on the various case studies. Therefore, the future of BE in the continent lies on the ability of the governments to think beyond the economic gains and consider the needs of communities. The evidence of negative impacts of COVID-19 on blue economic sectors – declining tourism earnings, food and economic insecurity combined with a fall in commodity prices – presents a considerable challenge which demands re-imagining and re-building the BE post-pandemic (FAO, 2020; UNCTAD, 2020). Our discussion on the role of a collaborative blue management approach contributes to processes to rebuild communities and develop measures for the recovery and resilience of Africa BE post-coronavirus. COVID-19 has also taught us that nature is resilient and can recover in a very short time. Therefore, studies on the state of the environment post-COVID-19 are much needed to provide guidance on the recovery trajectories especially in areas with large scale BE developments projects.

Undoubtedly, further research is needed to understand the extent to which the FSS evaluation and collaborative blue management approach would work in other contexts. For coastal states in the African continent to benefit from BE as the "new frontier" for economic development, there is an urgent need for a functional institutional governance framework. This framework should ensure that all actors in the BE sector focus on achieving an equitable and sustainable BE in Africa, for Africans. Therefore, to truly embrace the BE and achieve the promise of sustainable development for the African people as enshrined in the Agenda 2063 of the African Union, the development of the BE must incorporate social equity and ecological conservation.

DATA AVAILABILITY STATEMENT

The datasets generated for this study will not be made publicly available: The article is based on the review of peer-reviewed articles and the gray literature, including personal observations, and experiences from the authors.

ETHICS STATEMENT

The Kribi Port (Cameroon) and Vridi Canal (Côte d'Ivoire) case studies involving human participants were reviewed and approved by the United Nations Office on Drugs and Crime (UNODC) Regional Office for West and Central Africa. Written informed consent to participate in this study was provided by the participants, their legal guardian/next of kin, or the relevant stakeholders.

AUTHOR CONTRIBUTIONS

IO-Y conceived the idea. NM, IO-Y, and NK contributed to the methodological framework. IO-Y and NK contributed equally to the writing of the manuscript. JU and IA contributed to the introduction and case studies. IA produced **Figure 1**. NM contributed to the case studies and produced **Figure 2** and **Supplementary Table S1**. IE contributed to the management framework section and formatted the references. All authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fmars.2020.00586/full#supplementary-material

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