

Blue Horizon: Ocean Relief through Seaweed Aquaculture

Part I: Project Information

GEF ID
10573

Project Type
FSP

Type of Trust Fund
GET

CBIT/NGI
☐ CBIT
☐ NGI

Project Title
Blue Horizon: Ocean Relief through Seaweed Aquaculture

Countries
Regional, Philippines, Viet Nam

Agency(ies)
WWF-US

Other Executing Partner(s)
SEAFDEC, BFAR (Philippines), MARD (Viet Nam)

Executing Partner Type
Government

GEF Focal Area

International Waters

Taxonomy

Climate Change, Climate Change Adaptation, Climate resilience, Focal Areas, Livelihoods, Biodiversity, Influencing models, Demonstrate innovative approaches, Convene multi-stakeholder alliances, Transform policy and regulatory environments, Stakeholders, Communications, Education, Behavior change, Local Communities, Beneficiaries, Civil Society, Community Based Organization, Non-Governmental Organization, Academia, Private Sector, Individuals/Entrepreneurs, SMEs, Gender Equality, Gender results areas, Access to benefits and services, Gender Mainstreaming, Sex-disaggregated indicators, Gender-sensitive indicators, Capacity, Knowledge and Research, Learning, Indicators to measure change, Theory of change, Adaptive management, Knowledge Exchange, Peer-to-Peer, Knowledge Generation, Workshop, Seminar, Training, Capacity Development, Innovation, International Waters, Pollution, Nutrient pollution from all sectors except wastewater, Large Marine Ecosystems, Coastal, Aquaculture, Strategic Action Plan Implementation, Species, Plant Genetic Resources

Rio Markers**Climate Change Mitigation**

Climate Change Mitigation 1

Climate Change Adaptation

Climate Change Adaptation 0

Duration

48 In Months

Agency Fee(\$)

540,000.00

Submission Date

3/23/2020

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
IW-1-1	GET	3,000,000.00	18,830,000.00
IW-1-3	GET	3,000,000.00	18,830,000.00
Total Project Cost (\$)		6,000,000.00	37,660,000.00

B. Indicative Project description summary

Project Objective

To create new sustainable seaweed value chains that will deliver ecosystem services and provide socioeconomic benefits

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 1: Capacity building for seaweed aquaculture	Technical Assistance	Outcome 1: Strengthened capacity and uptake of best practices throughout seaweed value chains, and increased participation in global seaweed coalitions.	1.1.1. Support towards the International Seaweed Coalition Platform (e.g. institutional strategy, global market strategy) 1.1.2: Regional seaweed sector key metric targets (environmental, livelihoods) identified and guide for implementing better practices to reach targets 1.1.3. Regional workshops and trainings on more sustainable seaweed practices (as identified in 1.1.2, , including biosecurity measures to optimize production and prevent losses)	GET	1,203,571.00	7,353,820.00

Component 2: Enabling Environment for Seaweed Aquaculture in Philippines and Viet Nam	Technical Assistance	Outcome 2.1 Improved planning for seaweed aquaculture and capture of nutrients from the ocean	<p>2.1.1: National support for marine spatial planning that integrates more sustainable seaweed farming, which could include:</p> <ul style="list-style-type: none"> • Assessments of ecosystem carrying capacity • Site-specific development plans • Input to coastal and marine spatial maps for aquaculture expansion • User conflict analyses (at site level) 	GET	1,803,571.00	12,019,821.00
		Outcome 2.2: Strengthened governance, institutional and legal frameworks conducive for planning and accounting for seaweed aquaculture impacts – positive and negative	<p>2.1.2: National Seaweed Plans presented for adoption at relevant levels:</p> <ul style="list-style-type: none"> · Revised Seaweed Development Plan (Viet Nam) · Updated Seaweed Carrageenan Industry Roadmap (Philippines) <p>2.2.1: Policy and Regulatory gap analysis and associated Framework to facilitate seaweed aquaculture (as needed for Vietnam and Philippines)</p>			

Component 3: Seaweed Value Chains (production + processing)	Investment	<p>Outcome 3.1: Improved technologies and testing for seaweed value chains in PH and VN</p> <p>Outcome 3.2: Generating benefits from seaweed aquaculture for target communities (PH and VN)</p> <p>Outcome 3.3: Expanded collaboration with the finance sector and private sector to support seaweed value chains in Philippines and Viet Nam</p>	<p>3.1.1: Four demonstration farms to provide proof of concept of off-shore scalable seaweed businesses (based on zones identified in Component 2.1.2), with 4,400 tons of nitrogen and phosphorus captured</p> <p>3.1.2: Implementation of at least 2 seaweed value chain initiatives (adding value to raw seaweed in seaweed farming communities; improved propagules; transparency)</p> <p>3.2.1: Proof of concept of a scalable seaweed carbon credit model</p> <p>3.2.2: Sustainable Seaweed Toolkit and trainings for improved production and processing (incorporating best practices identified in 1.1.2)</p> <p>3.2.3: Seaweed farmer/cooperative support systems (marketing, business, access to financing)</p> <p>3.3.1: Development of 3 bankable business propositions to support 3.1 (scaling up 3.1.1 demonstration farms, implementation of bankable initiatives under 3.1.2), and building off PROBLUE Markets study and BFAR study to incentivize development of processing capability and/or bio-refinery solutions to deliver new seaweed products (e.g. fishmeal/oil replacement products, blue sugars for bio-plastics)</p> <p>3.3.2: Investment seminars and industry and investment forums conducted in collaboration with Global Seaweed Coalition, World Bank country offices, IFC, government representatives and private sector, including key value chain actors</p>	GET	2,103,572.00	12,852,821.00
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Component 4: Knowledge Management, M&E, and IW Learn (regional)	Technical Assistance	Outcome 4.1: Full participation in IW:LEARN and knowledge management/communication Outcome 4.2. Monitoring and evaluation system in place	4.1.1: Participation in two IW:LEARN regional meetings and one GEF International Waters Conference delivering IW:LEARN experience notes 4.1.2 Knowledge management and communications products, such as, · Lessons on improved zoning, private sector engagement, feasibility of carbon markets, supply demand models for different seaweed products, · Annual global seaweed coalition communication briefs 4.2.1: Monitoring and Evaluation reports (including project progress reports, midterm evaluation, terminal evaluation)	GET	603,572.00	3,687,825.00
Sub Total (\$)					5,714,286.00	35,914,287.00
Project Management Cost (PMC)						
GET					285,714.00	1,745,713.00
Sub Total(\$)					285,714.00	1,745,713.00
Total Project Cost(\$)					6,000,000.00	37,660,000.00

C. Indicative sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
GEF Agency	WWF US	In-kind	Recurrent expenditures	3,660,000.00
Civil Society Organization	WWF Philippines and WWF Vietnam	In-kind	Recurrent expenditures	500,000.00
Civil Society Organization	Ocean 2050	In-kind	Recurrent expenditures	1,000,000.00
Donor Agency	European Space Agency	In-kind	Recurrent expenditures	2,000,000.00
Donor Agency	World Bank PROBLUE	Grant	Investment mobilized	500,000.00
Private Sector	Private sector actors- processing, extraction, offtake	Other	Investment mobilized	25,000,000.00
Others	Lloyds Registry Foundation	Grant	Investment mobilized	3,000,000.00
Others	Scottish Association for Marine Science	In-kind	Recurrent expenditures	1,000,000.00
Recipient Country Government	Department of Fisheries, Viet Nam	In-kind	Recurrent expenditures	1,000,000.00
Total Project Cost(\$)				37,660,000.00

Describe how any "Investment Mobilized" was identified

• World Bank PROBLUE – World Bank PROBLUE will be investing in a seaweed market study, which will identify new potential seaweed products • Private sector actors – investment from private sector actors will support mobile seaweed processing units, seaweed refining plants, novel product development. The term Investment Mobilized has been used to reflect co-financing that excludes recurrent expenditure, and financing that will be leveraged alongside the GEF grant.

D. Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
WWF-US	GET	Regional	International Waters	NA	6,000,000	540,000	6,540,000.00
Total GEF Resources(\$)					6,000,000.00	540,000.00	6,540,000.00

E. Project Preparation Grant (PPG)
PPG Required



PPG Amount (\$)				PPG Agency Fee (\$)			
150,000				13,500			
Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
WWF-US	GET	Regional	International Waters	NA	150,000	13,500	163,500.00
Total Project Costs(\$)					150,000.00	13,500.00	163,500.00

Core Indicators

Indicator 5 Area of marine habitat under improved practices to benefit biodiversity (excluding protected areas)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
20,000.00			

Indicator 5.1 Number of fisheries that meet national or international third party certification that incorporates biodiversity considerations

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)

Type/name of the third-party certification

Indicator 5.2 Number of Large Marine Ecosystems (LMEs) with reduced pollutions and hypoxia

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (achieved at MTR)	Number (achieved at TE)

1	0	0	0
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LME at PIF	LME at CEO Endorsement	LME at MTR	LME at TE	
South China Sea				

Indicator 5.3 Amount of Marine Litter Avoided

Metric Tons (expected at PIF)	Metric Tons (expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
0.00			

Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO ₂ e (direct)	66000	0	0	0
Expected metric tons of CO ₂ e (indirect)	0	0	0	0

Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO ₂ e (direct)	66,000			
Expected metric tons of CO ₂ e (indirect)	0			
Anticipated start year of accounting				
Duration of accounting				

Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO ₂ e (direct)	0			
Expected metric tons of CO ₂ e (indirect)	0			
Anticipated start year of accounting				
Duration of accounting				

Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Total Target Benefit	Energy (MJ) (At PIF)	Energy (MJ) (At CEO Endorsement)	Energy (MJ) (Achieved at MTR)	Energy (MJ) (Achieved at TE)
Target Energy Saved (MJ)	0			

Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)
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Indicator 7 Number of shared water ecosystems (fresh or marine) under new or improved cooperative management

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Shared water Ecosystem	South China Sea			
Count	1	0	0	0


Indicator 7.1 Level of Transboundary Diagnostic Analysis and Strategic Action Program (TDA/SAP) formulation and implementation (scale of 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
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Indicator 7.2 Level of Regional Legal Agreements and Regional management institution(s) (RMI) to support its implementation (scale of 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)	
South China Sea	4				

Indicator 7.3 Level of National/Local reforms and active participation of Inter-Ministeral Committees (IMC; scale 1 to 4; See Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)	
South China Sea	4				

Indicator 7.4 Level of engagement in IWLEARN throught participation and delivery of key products(scale 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)	
South China Sea	1				

Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)

Female	11,000			
Male	4,000			
Total	15000	0	0	0

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

Indicator 5: Area of marine habitat under improved practices to benefit biodiversity: This area is only for the pilot sites for demonstration of new culture technology. As this GEF project is to be catalytic by stimulating and creating new markets, this area will expand to a larger area assuming success of the project. However, there are no estimates that are feasible to be made about how much this area will be expanded. **Indicator 6: Sub-indicator: Carbon sequestered or emissions avoided in the sector of Agriculture, Forestry, and Other Land Use:** This number is based on a conservative amount of seaweed biomass that falls off during production and ends up sequestered in the ocean bottom.

Part II. Project Justification

1a. Project Description

Global environmental and/or adaptation problems, root causes and barriers

Project scope and Environmental Significance:

The project will work at the global, regional, and national level to strengthen and develop seaweed value chains. The project will work in the South China Sea, and will be aligned with the Strategic Action Plan. More specifically, the project will work in the coastal and marine ecosystems of Viet Nam and Philippines, where potential for the expansion of seaweed aquaculture and seaweed aquaculture value chains exists. Seaweed farming is growing as a lucrative business in coastal provinces - farmed as a foodstuff and in food processing, as well as cosmetics and medical industries. The livelihoods of the people who live in these coastal areas depend on the quality of water and habitat in these rich marine ecosystems.

Seaweeds can be grown with no external inputs, removing eutrophying nutrients from the water and turning them into valuable protein, oils, green chemical feedstock and a range of industrial products. Producing large volumes of seaweeds for human food, animal feed and additives, pharma & medical, fertilizer and food additives could represent a transformational change in the global food security equation. In 2012, global production of seaweeds was approximately 3 million tons dry weight and growing by 9% per annum. Increasing the growth of seaweed farming up to 14% per year would generate 500 million tons dry weight by 2050, adding about 10% to the world's present supply of food, generating revenues and improving environmental quality (see table 1). Assuming a conservative average productivity from the best operating modern farms of about 1,000 dry metric tons

per km² (1 kg per m²), this entire harvest could be grown in a sea area of about 500,000 square kilometers, 0.03% of the oceans' surface area.

Additionally, seaweeds farming provides livelihood resilience for communities, ecosystem services for biodiversity enhancement and generates revenues for emerging countries in order to alleviate poverty. Seaweed can be integrated into multi trophic systems which can strengthen economic resilience of coastal communities, all while providing benefits that will stabilize and strengthen the health of the surrounding environment.

A key to making the seaweed industry a driver of environmental sustainability, poverty alleviation, livelihood resilience and shared prosperity, is to add more value closer to the production areas, thus creating more and better jobs for low-income coastal communities. To this end, the proposed project is intended to: 1) connect rapidly evolving, cutting edge science in the processing and use of seaweed to practical production technology; 2) create a forum for partnering technology to investors in developing countries; and 3) establish norms of operation to ensure that production systems remain among the most environmentally positive economic activities.

Table 1: Extrapolated ecosystem services from 500 million tons (dry weight) of seaweeds (WB, 2016)

Ocean area required	500,000 km ²	Based on average annual yield of 1,000 dry tons/km ² under current best practice. Equals 0.03% of the ocean surface area.
Protein for people and animals	50,000,000 tons	Assumes average protein content of 10% dry weight. Estimated value \$28 billion. Could completely replace fishmeal in animal feeds.
Algal oil for people and animals	15,000,000 tons	Assumes average lipid content of 3% dry weight. Estimated value \$23 billion. Could completely replace fish oil in animal feeds.
Nitrogen removal	10,000,000 tons	Assumes nitrogen content 2% of dry weight. Equals 18% of the nitrogen added to oceans through fertilizer.
Phosphorous removal	1,000,000 tons	Assumes phosphorous content 0.2% of dry weight. Represents 61% of the phosphorous input as fertilizer.
Carbon assimilation	135,000,000 tons	Assumes carbon content 27% of dry weight. Equals 6% of the carbon added annually to oceans from greenhouse gas emissions.
Bioenergy potential	1,250,000,000 MWH	Assumes 50% carbohydrate content, converted to energy. Equals 1% of annual global energy use.
Land sparing	1,000,000 km ²	Assumes 5 tons/ha average farm yield. Equals 6% of global cropland.
Freshwater sparing	500 km ³	Assumes agricultural use averages 1 m ³ water/kg biomass. Equals 14% of annual global freshwater withdrawals.

Environmental problem and root causes:

The literal erosion of the ocean's foundation is occurring - coral bleaching destroys reefs, mangrove loss reduces key habitat, calcium carbonate to buffer the water's pH is dissolving, nutrient pollution requires greater oxygen for decay of organic matter, suspended solids reduce photosynthesis, and rising temperature accelerates all of these processes. These impacts are most acutely observed in coastal and estuarine environments, and the stressors on these nearshore ecosystems are inhibiting ocean restoration interventions. In addition, the world population is growing, putting increasing pressure on arable land and fisheries.

The challenge is to find ways of capturing the carbon as CO₂ to reduce ocean acidity and allow for greater capacity of the ocean to slow the rate of climate change. Moreover, the extraction of nitrogen and phosphorus, which are the key nutrients that cause eutrophication in marine environments, is necessary to limit pollution and attempt to mitigate rising ocean temperatures. This is a global challenge and the solutions need to be tested and then scaled.

Barriers to scaling seaweed aquaculture include the following:

While the seaweed industry has a significant untapped potential towards supplying high quality, cost competitive biomass for new international value chains, including the potential processing and delivery of sustainably produced fishmeal and oil replacement products to green the growing aquaculture sector, there are significant problems that impair the industry from reaching its potential. The structure of the current industry is characterised by high disease outbreaks (e.g. ice-ice disease) due to climate change variability and low genetic variability of seedstocks; use (and loss) of Styrofoam and other material for buoyancy purposes; and lack of standards and protocols that adhere to an eco-system approach to optimize the environmental footprint of production. Barriers to scaling seaweed aquaculture, and achieving corresponding environmental benefits, include the following:

1. *Limited coordination, knowledge sharing, and standards for seaweed value chains and seaweed value chain actors:*

Seaweed farming is a growing sector and is gaining increased attention from a range of actors. While new seaweed initiatives are emerging, the seaweed value chain remains largely fragmented. In order to promote growth of the seaweed value chain, coordination and collaboration among value chain actors is needed. The lack of direction across the current industry again implies lost opportunities towards developing blue economy solutions that deliver against today's compounding environmental challenges.

An additional barrier is the lack of standards and metrics guiding seaweed farming. In order to increase scales of production, the quality of seaweed biomass needs to be standardized (in terms of food safety, environmental standards, etc) and agreed to by actors along the value chain. This requires linking good practices for seaweed farming and processing, and harmonizing global seaweed demands with regional and national seaweed farming.

2. *Barriers related to Marine Spatial Plans and development plans to promote expansion of seaweed farms and offshore seaweed farming*

The growth of seaweed farming is constrained primarily by lack of proper marine spatial plans and operationalization of these plans. The current industry in the tropics is based on inshore and intertidal areas where multiple conflicting users vie for space (tourism, shipping, animal aquaculture, fishing, energy production, etc.). In addition, current seaweed farming is operating in small-scale systems. Moving production offshore offers reduced competition with coastal areas and less disease and climate change impacts (as offshore cultivation is less intensively spaced, disease and parasites spread less readily) and greater space for seaweed farming growth potential.

To ensure a national enabling environment for seaweed farming, coordination is needed among various actors

including government agencies, seaweed associations, seaweed clubs, and private sector where applicable – for the development of seaweed development plans and Marine Spatial Plans. For seaweed development plans, the links to regional and global value chain market forces must be considered. Such plans rely on buy-in from multiple government agencies and seaweed associations and farmers for success.

3. *Limited biorefinery solutions for new seaweed products, which constrains market uptake*

Biorefinery systems need to be developed (ideally in the ocean to avoid the cost of transporting wet seaweed) in order to extract the various seaweed compounds for multiple applications. Seaweed products linked to market demand will encourage more demand for seaweed biomass, and this greater demand will make cultivation profitable for farmers.

Key barriers to overcoming constraints on biorefinery solutions largely relate to:

- Limited analysis of potential seaweed products, including links to demand markets and prices points. There are a paucity of new “bridge” markets for seaweed to absorb the increased amounts of biomass and promote increased growth of seaweed farming
- Potential biorefinery solutions are emerging but still has much untapped potential. In particular, new methods for downstream biorefinery processing are needed for pre-treatment, fractionation, extraction, and purification.
- In some cases, seaweed products are known, but support and promotion for commercialization is lacking.
- Limited private investment in biorefinery solutions for new, market viable seaweed products.

4. Barriers related to seaweed farming

There are numerous challenges related to seaweed farming. Small-scale coastal seaweed farming has been taking place for a long time. Technologies for seaweed farming have remained fairly rudimentary, and production systems often utilize plastics and polluting equipment (nylon, polystyrene and polypropylene wastes). New technologies and types of anchors, buoyancy systems, ropes, harvesting vessels and transportation are not always commercially available and affordable to farmers and cooperatives, which is needed to grow the sector in a more sustainable and safe way.

Offshore seaweed farming is relatively nascent. While such a system, adaptable to a wide variety of conditions, both temperate and tropical, and species, both red and brown, has been developed by Seaweed Seed Supply A/S in Denmark, it has not yet been deployed in tropical conditions. Offshore seaweed farming brings additional challenges, including “higher levels of investments relative to traditional aquaculture infrastructure, increased insurance costs due to operations in exposed conditions, a low nutrient density, a lack of knowledge about the farmed species and their behaviour and ensuring workers’ wellbeing in demanding environments. Protecting the safety of food, employees and infrastructure will be a challenge in difficult conditions and remote areas that are hard to reach and monitor from land” (Lloyds Seaweed Manifesto 2020).

Overall, seaweed farming needs to be linked to new and ongoing technology development in genetics, species selection and disease management to ensure resilience.

5. Barriers related to the seaweed value chain and socioeconomic benefits for seaweed farming communities

In the Philippines, farmers often receive limited income from the seaweed they farm. Traders/middlemen control the price that seaweed farmers receive as well as access to financing (such as loans). The real profit in seaweed goes to middlemen further up the seaweed value chain. This presents a barrier to improving seaweed production as well as to improving the lives of the seaweed farmers.

Baseline scenario and associated baseline projects

There is an active and growing seaweed sector. Total seaweed production globally by volume is at 12 million tonnes and is valued at US\$6 billion. 85% of seaweed production is used in food products, while extracts from seaweed make up 40%. Carrageenan, the most popular seaweed extract, is used in pet food, dairy industry, meat industry, and in pharmaceuticals (FAO 2018).

Asia contributes the majority of farmed seaweed, with China, Indonesia and the Philippines representing the top seaweed producing countries by volume (FAO 2018). The expansion of seaweed farming in tropical developing countries (Viet Nam and the Philippines provide an ideal opportunity for this project) could have large positive impacts on local poverty, ecosystem management and climate change mitigation. Considering the viability of seaweed in a range of industries, and the limited negative environmental externalities, there is a significant opportunity to develop and strengthen seaweed value chains and new markets.

- Contribution to feed markets. Seaweed presents an opportunity for replacing fishmeal and oil alternatives without significant negative environmental externalities. Algae protein provides similar nutritional value to soy protein, while the lipid in seaweed can be used as a fish oil replacement for aquaculture (an exponentially growing industry) and animal feed. This would thereby reduce the pressure on fisheries.
- Structural developments in global energy markets. Private sector actors are increasingly looking for chemicals, plastics, textiles, fuel and electricity to come from biomass rather than fossil fuels. Seaweed would be particularly desirable, as its production would not compete with terrestrial food production, and the inputs to seaweed production are limited. As such, there is a huge opportunity to develop seaweed's contribution to biomass and global energy markets, while ensuring limited environmental impact.
- Monetization of social goods from production. Ocean forests hold the potential to become valued carbon sinks to mitigate climate change and support biodiversity. An opportunity exists to quantify seaweed climate mitigation potential, and recognize seaweed as a means to offset carbon, to foster private sector investment in seaweed value chain development.
- Alignment with the South China Sea SAP, which clearly identifies unsustainable aquaculture as a key threat to the SCS region (for example, on mangroves and seagrass, as well as coastal pollution). The project addresses this by advancing sustainable seaweed production, which advances the capture of CO₂ in order to help reduce salinity and other forms of harmful pollutants. In addition to this, it will be supporting fisheries resilience broadly, in terms of reducing reliance of coastal communities on dwindling fish resources, supporting sustainable local food production.

Being able to produce enough biomass and protein for the growing and increasingly wealthy human population with no new land and freshwater expropriation for agriculture would dramatically reduce humanity's ecological footprint relative to current trends and projections while aligning with national plans to meet the SDGs (Figure 1).



Figure 1. Through expanded and more profitable seaweed markets, developing countries can build new and bankable ocean biomass and processing value chains to elevate people out of poverty and leapfrog over traditional incremental enhancements of livelihoods while safeguarding the ecological integrity of marine and terrestrial ecosystems.

Global and regional baseline plans and activities:

At a regional and transboundary level, the project will build on the [South China Sea Large Marine Ecosystem Strategic Action Plan](#) and the [Sulu Celebes Large Marine Ecosystem Action Plan](#). Within this, the [UNEP Regional Seas Program \(COBSEA\)](#) is supporting implementation of National Action Plans towards the Strategic Action Plan.

The project aligns well with the South China Sea SAP, which clearly identifies unsustainable aquaculture as a key threat to the SCS region (for example, on mangroves and seagrass, as well as coastal pollution). The project will support sustainable seaweed production, which captures CO₂, harmful pollutants, and helps reduce salinity.

In addition, the project will build on the following planned and ongoing seaweed interventions, which each are pivotal in advancing the overall objective and the individual components, outcomes and outputs of this project:

1. [The World Bank and PROBLUE](#) have been developing market and case studies for seaweed expansion and novel products that would increase seaweed demand.
2. The [US Department of Energy's 'Advanced Research Projects Agency - Energy' \(ARPA-E\)](#) has invested \$40 million into seaweed aquaculture research as potential biofuels and has developed site selection software that supports proper investment locations for optimizing seaweed growth. ARPA-E has also developed seaweed cultivation and harvest equipment methods. Several demo projects are ongoing in collaboration with private sector entities. During the PPG phase, this project will coordinate with ARPA-E and its' partners to identify technology applications suitable for a Southeast Asian context.
3. [Lloyds Register Foundation](#) is funding seaweed product testing for chemical identification as well as a Coalition for Safe Seaweed Production. They are also working to establish an International Roundtable on Sustainable Seaweed that convenes key stakeholders around global safety standards. In June 2020, Lloyds Register Foundation launched the Seaweed Manifesto alongside the UN Global Compact, Action Platform for Sustainable Ocean Business, The Seaweed Manifesto is a visionary document looking at how to scale up the industry responsibly. Signatories include universities, private sector companies, NGO's, and government – including BFAR.
4. With the support of the Jeremy and Hannelore Grantham Environmental Trust, [WWF-US](#) made a \$1.5 million impact investment in Ocean Rainforest, a seaweed farming operation in the Faroe Islands, to “accelerate and scale growth of global offshore seaweed production....”^[1]
5. The [Southeast Asian Fisheries Development Center \(SEAFDEC\)](#) is an intergovernmental body that supports fisheries development in the region. It includes 11 members states: Brunei Darussalam, Cambodia, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Myanmar, **Philippines**, Singapore, Thailand, and **Viet Nam**. SEAFDEC has extensive experience in southeast Asia in setting up and helping to operationalize seaweed farms and processing facilities. Seaweed is among the commodities in which research on seed production, refinement of culture techniques, socio-economics, and climate change adaptation is being conducted at the Aquaculture Department (AQD) under various Thematic Programs (5-year term and renewed thereafter). There is a Seaweed Biotechnology Unit at AQD's Laboratory for Advanced Aquaculture Technologies. As disease is recognized as a major constraint limiting the productivity of seaweed farms, AQD is working with the SeaweedSTAR program on a project (work package) on disease and pest detection. The project is for 3 years and ongoing. Specialized training courses for BFAR staff are conducted upon request. Training courses for seaweed farmers are conducted upon request of NGO's or LGU's who allocate training funds for the projects being implemented. It is also engaged in information dissemination and exchange through print publication of extension manuals, commodity brochures, videos, and other information materials (seaweeds included) which are distributed/exchanged through the AQD Library or can be accessed online through the SEAFDEC Institutional repository.

6. PEMSEA has a partnership that spans 11 countries in SE Asia and 21 non-country partners for sustainable development of the seas, and ocean and coastal governance.
7. The SeaweedSTAR programme is a £6.2m project running through December 31, 2021. The programme is primarily in collaboration with **Philippines**, Malaysia, and Tanzania, and works on (1) disease and pest detection, (2) biosecurity, farm management and legislation, (3) characterisation, conservation and exploitation of algal genetic resources towards crop improvement, and (4) socio-economic resilience.
8. The GENIALG project is working to design high yield seaweed cultivation systems to promote economically and environmentally sustainable seaweed biomass production in Europe (ending December 2020).
9. Numerous seaweed livelihoods projects have been attempted around the world by development and aid organizations with varying degrees of success due to the complexity and length of the market chain and the various products that can be produced through chemical extraction of seaweed.
10. While private sector investment is beginning in regions where regulatory frameworks and spatial planning are more advanced, the amount of seaweed that can be produced in these more developed regions is insufficient to realize the cumulative effects needed to mitigate ocean acidification, climate change and eutrophication. Carrageenan and agar are products that have traditional markets, but the private sector needs to be stimulated on carbon markets, and new product development. The private sector mobilization will increase following the World Bank's markets assessments on seaweed which will provide roadmaps with for novel engagement with the private sector.
11. ASC & MSC joint Seaweed standards. ASC and MSC have created a 5 guiding principles for sustainable seaweed production: (1) protection of wild populations so that they are not over-exploited, (2) harvesting and farming activities that allow for the maintenance of the structure, productivity, function, and diversity of the existing ecosystem, (3) effective management such that the system in place respects local, national, and international laws, (4) social responsibility, and (5) community relations and interaction.
12. Mastercard and Accenture have developed a blockchain solution that is referred to as "Tip the Farmer." The initiative is to help deliver the appropriate share of a products value to the farmer that produced the product. Mastercard provides accounts and credit cards to farmers that register to the program, and money for the product can be transferred electronically to the farmer. This system has been used by consumers that choose to "tip" the farmer by scanning codes on product packaging to send payments directly to farmer accounts. This could also be used to reward better product quality or quickness to market. One opportunity to use this for carbon credits to seaweed farmers, and this will be explored in PPG Phase.

Viet Nam baseline plans and activities:

Annually, Viet Nam produces approximately 101,000 metric tons of seaweed on 10,000^[2] hectares of coastline. Seaweed production is concentrated on the coastal areas of North Viet Nam, the North-central coast, and the south-central coast. The main seaweed species farmed includes Gracilaria, Caulerpa, Eucheuma, and Kappaphycus. Viet Nam has a wide coastline on which to expand seaweed production and have shown a national interest in doing so. This provides a strong baseline on which the project can build to support seaweed development in the country.

Seaweed baseline initiatives in Viet Nam include the following:

1. Blue Economy - Viet Nam has adopted a marine economic development strategy to 2030, with a vision to 2045. This strategy includes strong emphasis on sustainable aquaculture.
2. Marine Spatial Planning - Viet Nam instituted a new Planning Law, effective as of January 1, 2019, which provides a legal basis for developing national marine spatial planning (MSP). MONRE (VASI) and MPI are leading a Marine Spatial Planning (MSP) process between 2021-2022, with support from

KOICA funds. The new MSP is expected to provide for more detailed and integrated multisector planning, and includes the coastal waters with the outer boundary of six nautical miles from the coast.

3. An inter-sectoral committee that advises on sustainable development of the Viet Nameese marine economy will be established based on Resolution 36 (Blue Economy) signed by the Prime Minister (Prime Minister Decision) in 2019. An “ICM Coordination Committee” was established under PEMSEA and includes various sectors, however it has had limited success.
4. A national marine plan for the sustainable exploitation and use of coastal resources is currently under development by MONRE and will be streamlined with the MSP (above) in accordance with relevant provisions in the Planning Law.
5. Marine Aquaculture Strategy to 2030 – Under MARD, the marine aquaculture strategy is oriented towards sustainable production, technological expansion, climate change adaptation, eco-certification and the gradually shift of production models to the offshore. Identified priority provinces for offshore marine aquaculture include Kien Giang, Phu Yen, Khanh Hoa, Quang Ninh, Hai Phong, Ba Ria - Vung Tau, Ninh Thuan and Binh Thuan , Binh Dinh, Ca Mau. The strategy targets 400,000 MT of seaweed production by 2030, of which 100,000 MT will come from offshore operations.
6. Under the framework of the Aquaculture Development Strategy towards 2030, which expects to be endorsed by the Prime Minister by the end of 2020, the Department of Fisheries is developing three projects: (1) development of seaweed production for export up to 2030; (2) technologies for seedling production and cultivation of a number of economic-valued seaweeds; and (3) Project on environmental monitoring, fishery extension, and trade promotion.
7. Seaweed Development Plan for 2010-2020 – This Plan is under MARD (details are provided under national plans and priorities).

Philippines baseline plans and activities:

The Philippines is the third largest producer of seaweed in the world. Two major species are farmed - *Eucheuma cottonii* (Kappaphycus alvarezii) and *Eucheuma spinosum* (Eucheuma denticulatum) for carrageenan extracts – concentrated in four key production areas in the country: ARMM (40%), Region IV-B (27%), Region IX (13%) and Region VII (6%). Over 500,000 people receive income from seaweed farming, with an additional 10,000 jobs generated for seaweed processing and related activities. The seaweed industry relies on effective collaboration between the Bureau of Fisheries and Aquatic Resources (BFAR), local authorities, cooperatives and research institutions.

Farmed seaweeds are raw material for carrageenan production, exported to China, Denmark, France, Hong Kong, Spain, UK and USA; while semi-refined carrageenan and refined carrageenan are exported to USA, Belgium, Denmark and UK. Philippine-grade carrageenan is recognized as reliable in the international market (FAO 2018).

The active seaweed industry – with cooperatives and farming associations in place, as well as links to international markets, provides a strong baseline for the GEF project to build on and is a key reason Philippines was selected for this project.

Seaweed baseline initiatives in Philippines include the following:

1. Ongoing seaweed projects include Global Seaweed Star (Global Challenges Research Fund and UK Research and Innovation), Net-Works (ZSL), and Protect Wildlife Project (Department of Environment and Natural Resources, USAID, Lutheran World Relief, ECLOF).
2. PEMSEA is undertaking a Feasibility Analysis for Investment in Seaweed Farming on Siargao Island vs. Green Island (Roxas, Palawan) with BlueYou Consulting Ltd.
3. BFAR has a seaweed roadmap (2016-2022) and includes 3 components: (1) Improved/increased production; (2) organized seaweed farmers; and (3) promotion/commercialization of seaweed products.. In addition, seaweed cooperatives have a Carrageenan Industry Roadmap (ending 2020).

4. BFAR is developing a nationwide network of seaweed farmer/fisherfolk cooperatives. Within this network, BFAR is providing trainings on seaweed production and marketing to empower seaweed farmers. To date, more than 40 seaweed coops are officially established, and models are operational.
5. TESDA Seaweed Production NC II provides competency standards and training arrangements for seaweed farmers “to operate and maintain seaweed nursery, grow-out seaweed, produce raw dried seaweed and market seaweed.”
6. Department of Agriculture/Philippine Rural Development Project (PRDP) - PRDP is a PhP 27.5 billion project jointly funded by the World Bank, National Government and Local Government Units, of which a full 92% is designed to deliver goods and services directly to the people through I-BUILD and I-REAP. A National Value Chain Analysis for Seaweeds is being undertaken as part of the project.

Proposed alternative scenario

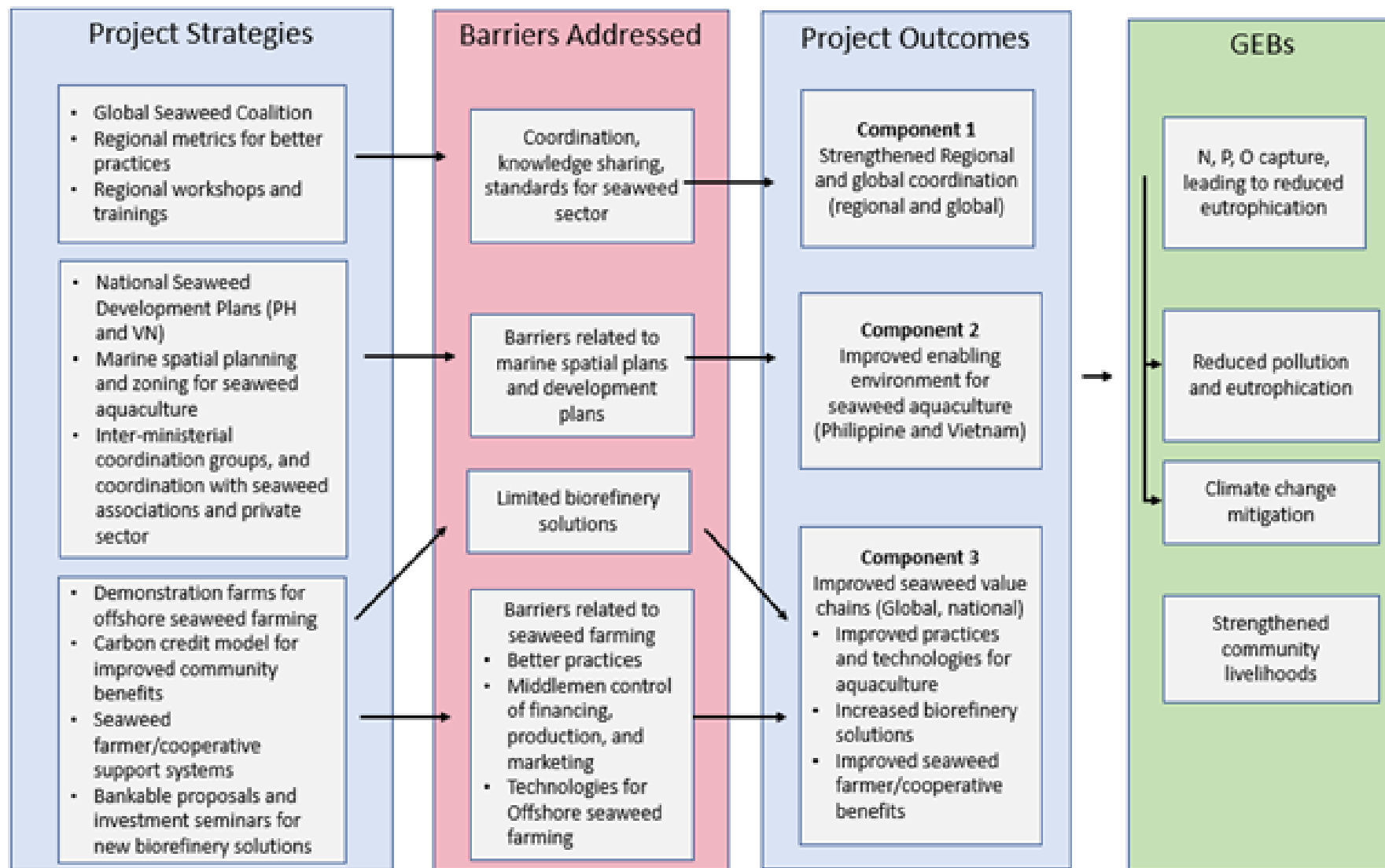
The project theory of change is that:

- If there is a strengthened enabling environment for seaweed farming through an improved policy environment and planning (policy gap analysis/proposals, and seaweed development plans);
- If seaweed farmers/cooperatives adhere to better practices (environmental, social, food safety);
- If seaweed farmers/cooperatives have quality propagules and proof of concept for farming seaweed further offshore (through demonstration farms and seaweed value chain initiatives);
- If investment for new biorefinery solutions (e.g. seaweed to replace fish oil in aquaculture feed) is increased via investment seminars, engagement with private sector, and key partners (World Bank, Lloyds Registry Foundation);

Then barriers to scaling the seaweed value chain will be removed and seaweed farming will be scaled up, with the seaweed capturing phosphorus, nitrogen and carbon, preventing eutrophication and reducing the carbon footprint (by replacing soy in animal feed, carbon capture).

In addition, increased access to carbon credits, improved business and marketing skills, and value-adding technologies for seaweed farming communities will increase income and contribute to strengthened community livelihoods for seaweed farmers and processors (largely women) in Philippines and Viet Nam.

The Theory of Change is depicted in Figure 2 below.



The overall vision of the project is to create new sustainable seaweed value chains that will deliver ecosystem services and provide socioeconomic benefits. To accomplish this, the project will work with partners towards setting up of a global coalition of key global value chains providers and academic centres of excellence; build regional capacity for seaweed aquaculture by strengthening and promoting the uptake of best practices across seaweed value chains and participation in global seaweed coalitions (Component 1). The project will also create an enabling environment for seaweed aquaculture at the national level – the project will support processes to identify appropriate areas for seaweed expansion, and to operationalize management plans specific to such areas, with accompanying plans and coordination mechanisms (national/global) to support this (Component 2). In areas deemed viable for seaweed aquaculture, the project will work with producers and cooperatives to pilot off-shore farms that will serve as proof of concept for off-shore seaweed production. In addition, the project will support a proof of concept for a scalable seaweed carbon credit model, and finally, expanded collaboration with the finance sector and private sector (Component 3). All of these activities will be monitored and communicated via multiple channels. In this way the project will utilize and expand on current baseline activities in the seaweed industry in Philippines and Viet Nam to promote the interests of seaweed farmers and their communities, and grow the global market for seaweed in a sustainable and responsible fashion.

The project will be achieved through the following components, outcomes, and outputs:

Component 1: Regional^[1] capacity building for seaweed aquaculture

Outcome 1: Strengthened capacity and uptake of best practices throughout seaweed value chains, and increased participation in global seaweed coalitions

At the global level, the project will work with Lloyds Registry Foundation to support the International Seaweed Coalition Platform. Private sector and investor engagement advanced at the global seaweed coalition platform level will trickle down to the regional and national levels and incentivize seaweed farming and value chains. At the regional level, the project will work with SEAFDEC to support cross-learning and best practices across seaweed-farming states in Southeast Asia. Monitoring and best practices developed at the regional level will be aligned and provide input into the International Seaweed Coalition Platform.

1.1.1: Support towards the International Seaweed Coalition Platform (e.g. institutional strategy, global market strategy)

1.1.2: Regional seaweed sector key metric targets (environmental, livelihoods) identified and guide for implementing better practices to reach targets

1.1.3: Regional workshops and trainings on more sustainable seaweed practices (as identified in 1.1.2, including biosecurity measures to optimize production and prevent losses)

Component 2: Enabling Environment for Seaweed Aquaculture in Philippines and Viet Nam

Outcome 2.1: Improved planning to facilitate seaweed aquaculture and capture of nutrients from the ocean

Under this Outcome, the project will fund plans and assessments to identify areas suitable for seaweed farming, taking into account ecosystem carrying capacity, climate change scenarios, and existing uses to minimize any user conflict. These assessments will help inform coastal and marine spatial maps for seaweed aquaculture expansion. For suitable areas, the project will support site specific development plans to ensure the enabling conditions are in place to establish and operationalize seaweed farms.

In addition, the project will support National Seaweed Plans. In Viet Nam, the project will support D-fish and MARD to revise and develop a 10-year Seaweed Development Plan. In Philippines, the project will support BFAR on a Seaweed Carrageenan Industry Roadmap. These plans will support national plans and strategies to expand seaweed farming in a strategic and sustainable fashion.

2.1.1: National support for marine spatial planning that integrates more sustainable seaweed farming, which could include:

- Assessments of ecosystem carrying capacity
- Site-specific development plans

- Input to coastal and marine spatial maps for aquaculture expansion
- User conflict analyses (at site level)

2.1.2: National Seaweed Plans presented for adoption at relevant levels:

- Revised Seaweed Development Plan (Viet Nam)
- Seaweed Carrageenan Industry Roadmap (Philippines)

Outcome 2.2: Strengthened governance, institutional and legal frameworks conducive for planning and accounting for seaweed aquaculture impacts – positive and negative

While the seaweed sector is well established in Philippines and Viet Nam, the National Seaweed Plans developed through the project, and plans for seaweed expansion into off-shore areas, may require new policies, regulations or guidelines to ensure a supportive enabling environment for the sustainable expansion of seaweed farming. A policy and regulatory gap analysis will be undertaken in Philippines and Viet Nam. Based on this gap analysis and based on government support, the project may support drafting of specific guidelines or frameworks to address identified barriers to seaweed farming.

2.2.1: Policy and Regulatory gap analysis and associated Framework to facilitate seaweed aquaculture (as needed for Viet Nam and Philippines)

Component 3: Seaweed Value Chains (production + processing)

Outcome 3.1: Improved technologies and testing for seaweed value chains in PH and VN

A no conversion (mangroves etc.) and sustainable intensification approach will be at the core of growing the seaweed aquaculture sustainably. Utilizing experiences from the USDOE ARPA-e MARINER program, this project will work to address near coastal barriers (including disease outbreaks) via a gradual move of seaweed production away from the shoreline and into the open ocean.

Establishing four demonstration farms will happen within national marine spatial plan (MSP) frameworks, and with the specific goal of advancing uniformly accepted risk assessment, rapid alert systems and data collection in order to develop safe modes of production, focusing on food safety, occupational safety and environmental safety and in order to overcome barriers of insufficient information that directly limit off-take agreements amongst global supply chain actors, contribute to the low level of regulations, and represent a barrier for insurability.

In addition, the project will support seaweed value chain initiatives to address barriers to production and processing. This may include new production or processing technologies that add value to seaweed closer to the farming communities, improving propagules to ensure they are resistant to disease, and supply chain transparency initiatives to better monitor against Global Seaweed Coalition food safety protocols, provide quality assurance, and thereby connect to global markets and supply chain actors. Viable initiatives will be shortlisted during the PPG stage and selected during execution based on supply chain assessments and consultations.

3.1.1: Four demonstration farms to provide proof of concept of off-shore scalable seaweed businesses (based on zones identified in Component 2.1.2), with 4,400 tons of nitrogen and phosphorus captured

3.1.2: Implementation of at least 2 seaweed value chain initiatives (adding value to raw seaweed in seaweed farming communities; improved propagules; transparency)

Outcome 3.2: Generating benefits from seaweed aquaculture for target communities (PH and VN)

In addition to piloting new technologies under Outcome 3.1, the project will work with seaweed farmers in target communities to (a) increase the effectiveness of activities under Outcome 3.1, and (b) improve the practices and benefits for existing seaweed farms and seaweed farmers. To improve seaweed farming practices, the project will develop and deploy a Sustainable Seaweed Toolkit that incorporates food safety protocols identified by the Global Seaweed Coalition Platform and regional best practices identified under outcome 1.2. In addition, to address barriers related to lack of finance and selling power, the project will also build support systems and tools related to marketing, business, and finance. The Toolkit and trainings will be provided to seaweed farmers and seaweed cooperatives in the target communities.

Finally, to increase the benefits seaweed farmers receive and incentive expansion of seaweed farming in PH and VN, the project will build on experiences from Oceans 2050 to pilot a seaweed carbon credit model. Oceans 2050 is already undertaking an analysis of the carbon capture potential for various seaweed strains. The project will help deploy models for farmers to receive funds for the carbon captured by their seaweed farms in target communities.

3.2.1: Proof of concept of a scalable seaweed carbon credit model

3.2.2: Sustainable Seaweed Toolkit and trainings for improved production (incorporating best practices identified in 1.1.2)

3.2.3: Seaweed farmer/cooperative support systems (marketing, business, access to financing)

Outcome 3.3: Expanded collaboration with the finance sector and private sector in Philippines and Viet Nam

The project will leverage the finance and private sector to unlock finance, scale up seaweed production, and increase demand for seaweed biomass. This includes developing bankable business propositions to co-finance and scale up activities under Outcome 3.1, including processing and biorefinery technologies that bring value to seaweed farming communities while also contributing to the increasing demand for seaweed biomass.

3.3.1: Development of 3 bankable business propositions to support 3.1, and building off PROBLUE Markets study and BFAR study to incentivize development of processing capability and/or bio-refinery solutions to deliver new seaweed products identified in WB market study (e.g. fishmeal/oil replacement products, blue sugars for bio-plastics)

3.3.2: Investment seminars and industry and investment forums conducted in collaboration with Global Seaweed Coalition, World Bank country offices, IFC, government representatives and private sector, including key value chain actors

Component 4: Knowledge Management, M&E, and IW Learn (regional)

Outcome 4.1: Full participation in IW:LEARN and knowledge management/communication

To ensure knowledge from the project is appropriately documented and disseminated, the project will implement a knowledge management and communications plan (to be developed during PPG phase). This will support scaling up of project lessons and impact. Potential communication and knowledge products include: operational plans for establishing off-shore seaweed farms, lessons and best practices associated with deploying seaweed

value chain technologies, trainings and toolkits for improved seaweed production, Seaweed Development Plans, methodologies for ecosystem carrying capacities, a report on regional seaweed metrics and targets, and proof of concept notes and plans for rolling out a scalable seaweed carbon credit model (in coordination with Oceans2050). Knowledge management and communications will build on project partner's existing networks and communication mechanisms. SEAFDEC is a key partner for ensuring regional knowledge dissemination and harmonization.

The project will actively participate in and contribute to IW: LEARN, including PMU attendance at regional meetings, the GEF IW Conference, and twinning exchanges. A website will be developed that is linked and searchable through IW: LEARN's International Waters Information Management System. This will be used to disseminate project results internationally and to relevant practitioners.

4.1.1: Participation in two IW:LEARN regional meetings and one GEF International Waters Conference delivering IW:LEARN experience notes

4.1.2 Knowledge management and communications products, such as,

- Lessons on improved zoning, private sector engagement, feasibility of carbon markets, supply demand models for different seaweed products,
- Annual global seaweed coalition communication briefs

Outcome 4.2. Monitoring and evaluation system in place

The PMU and project partners will follow an M&E plan to monitor and report on project progress, and identify any areas where adaptive management is needed. Under this Outcome, the following reports will be drafted and delivered:

- A bi-annual Project Progress Report (PPR), including tracking against the results framework and work plan
- Annual Work Plan and Budget (AWP&B)
- Quarterly Financial Report
- Annual adaptive management meeting to review project results and discuss any necessary adjustments to the project strategy
- Mid-term and Terminal Evaluation

4.2.1: Monitoring and Evaluation reports (including project progress reports, midterm evaluation, terminal evaluation)

Alignment with GEF focal area and/or Impact Program strategies

The proposed project is aligned with the GEF Focal Area on International Waters. Through increased and improved seaweed aquaculture, the project will support (1) nutrient pollution remediation through phosphorous and nitrogen capture, (2) carbon sequestration, and (3) provide an 'aggregator' habitat for increased levels of marine biodiversity. The seaweed biomass entering the value chain will provide a sustainable substitute for fishmeal, oil, and feed (and thereby reduce pressure on fisheries), as well as provide an alternative and renewable energy tool.

The project will directly support the below International Waters Focal Area objectives:

Objective IW-1-1: Strengthen blue economy opportunities through sustainable healthy coastal and marine ecosystems

The project will strengthen sustainable seaweed production and processing in Viet Nam and Philippines, which supports both national development strategies as well as healthy coastal and marine ecosystems. In Viet Nam, the project is closely aligned with the country's national Marine Economic Development Strategy (which includes Blue Economy goals). Regionally, the project will support knowledge sharing of seaweed as a blue economy opportunity through the regional executing agency.

Objective IW-1-3: Strengthen blue economy opportunities by addressing pollution reduction in marine environments.

This project will work closely with the private sector, communities, and academic institutions to support innovative technologies for seaweed production and processing.

Overall, the project will strengthen blue economy opportunities while also addressing pollution reduction. Seaweed captures nitrogen, phosphorus, and carbon which helps reverse and prevent eutrophication, supporting local and global ocean health.

Incremental/additional cost reasoning and expected contributions from the baseline

The project will build off a baseline of private sector, government, academic, and NGO initiatives to strengthen and support scaling up of the seaweed value chain. This baseline includes:

- Global initiatives – various private sector actors are driving seaweed value chains. The Global Seaweed Coalition is working with a range of stakeholders to establish standards (e.g. for food safety) to help standardize the seaweed sector.
- Regional initiatives - SEAFDEC helps coordinate member states and facilitates information on various research programs and technologies (including for seaweed). The South China Sea SAP also provides an important baseline from which the project can build.
- National – Philippines and Viet Nam have various initiatives to strengthen seaweed farming nationally, and have seaweed associations in place.

With GEF financing, the project will build on this baseline to (1) accelerate seaweed farming in Philippines and Viet Nam (as well as regionally through knowledge sharing), thereby supporting seaweed farmer livelihoods resilience, (2) bring investment to biorefinery solutions for new and existing seaweed products. The biorefinery solutions will be localized (e.g. near seaweed farming communities in Philippines and Viet Nam), which will bring new sources of income and access to the value chain for these communities. In addition, the new products will encourage greater uptake for seaweed biomass upstream. And (3) promote better practices for seaweed farming and seaweed value chains through the Global Seaweed Coalition and trainings/toolkits.

The baseline and project strategies will together unlock barriers to scaling seaweed value chains. Global environmental benefits from more seaweed farming include phosphorus, nitrogen and carbon capture, which help reduce eutrophication and contributes to greenhouse gas mitigation. In addition, the project will directly benefit communities through strengthened livelihoods.

Baseline	Proposed Alternative	Environmental Benefits
Regional capacity and knowledge sharing on seaweed		
There are limited platforms related to seaweed production and many existing lessons and best practices that have yet to be sufficiently collated.	The project will provide avenues for sharing regional and global best practices.	Increased seaweed production – arising from both new areas zoned for seaweed and through intensified production in existing areas – will lead to numerous global environmental benefits, including: <ul style="list-style-type: none">carbon, nitrogen and phosphorous capture, which helps prevent and reverse eutrophicationIncreased levels of biodiversity due to healthier marine habitats (linked to above)
Enabling environment for seaweed in Philippines and Viet Nam		
Philippines and Viet Nam have national plans and policy frameworks that allow for seaweed aquaculture.	The project will support participatory marine spatial planning processes and national seaweed development plans – this will help identify appropriate areas for seaweed expansion and a plan for growth to meet market demand.	
Seaweed value chains		
There are multiple baseline initiatives being undertaken to improve seaweed value chains, including <ul style="list-style-type: none">Methodologies for increasing seaweed production and processingCarbon credit marketsmarket analyses to understand potential demand and markets for seaweedGlobal Seaweed Coalition by Loyds Registry Foundation	The project will: <ul style="list-style-type: none">Pilot technologies for off-shore seaweed productionLink communities to carbon credit markets, providing income to communities engaged in seaweed productionFacilitate investments to process seaweed into products indicated by baseline market analysesSupport Global Seaweed Coalition, and will pilot standards and metrics for better seaweed production in the project demonstration farms	

Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)

Through seaweed aquaculture, the project will contribute to carbon, nitrogen, and phosphorus capture, which helps prevent and reverse eutrophication. In addition, there is testimonial evidence of seaweed being linked to increased levels of biodiversity.

The proposed project will contribute to three GEF Core Indicators: i) Greenhouse Gas Emissions Mitigated; ii) Number of shared water ecosystems under new or improved cooperative management; iii) Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment.

Core Indicator 5: Area of marine habitat under improved practices to benefit biodiversity

Seaweed contributes to Nitrogen and Phosphorus capture, thereby reducing pollution and hypoxia. By ensuring an enabling environment for seaweed farming regionally and in Philippines and Viet Nam specifically, and through the project demonstration farms, the project is expected to contribute to 4,400 tons of nutrient capture to reduce pollution and hypoxia in the South China Sea. This can reduce stressors on habitat for marine biodiversity.

Core Indicator 6: Greenhouse Gas Emissions Mitigated (metric tons of CO₂e)

Seaweed absorbs a significant amount of carbon. While some of the absorbed CO₂ may be released during the processing stage, studies show that 5-10% of the seaweed biomass will end up in deep-sea sedimentation before harvest, serving as a permanent carbon capture. Additionally, some of the seaweeds may serve to reduce biogas production from the animal husbandry sector, offsetting any CO₂ re-release. Overall, through seaweed production, the project will contribute to 66,000 metric tons of greenhouse gas mitigation.

Core Indicator 7: Number of shared water ecosystems (fresh or marine) under new or improved cooperative management

The project will support national/local reforms, including regulatory frameworks, for seaweed value chains in Philippines and Viet Nam and the South China Sea. This work will be tied together at the regional level through the lead executing agency.

Also towards this core indicator, the project will dedicate 1% of the budget to IW Learn activities, including creation of a website, participation in the biannual IW Conference, and twinning events. The project will also produce experience and results notes under Component 4 to support knowledge sharing and scaling up of project results.

Core Indicator 11: Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment.

Through strengthened seaweed value chains, including the establishment of medium-scale seaweed farms, the project will support income generation and livelihoods to local seaweed farmers in Philippines and Viet Nam. The majority of seaweed farmers are women, therefore it is expected that many of these beneficiaries will be women (see also gender section).

It is expected that the project will also provide training and tools that directly benefit government staff, communities, and private sector actors. Overall, the project will directly benefit 4,000 men and 11,000 women (15,000 people total).

Innovation, sustainability and potential for scaling up

Building on an extensive baseline and large partnership at the global, regional and local level, the project will support new standards and technologies to grow and guide the global seaweed industry.

Innovation

One innovation of the project will be the creation of technologies (adapting existing technologies, etc.) that would allow for the expansion of seaweed cultivation into offshore areas. When appropriately sited, seaweed farms are a cleansing agent for coastal and offshore ecosystems. Siting farms further offshore will require significant engagement with the cooperatives, academics, local municipalities and the national governments to identify feasible locations with upwellings, moderate currents and protection from heavy wind and storm surges as well as to address the issue of tenure and resource rights. The technology for farms and for siting has been advanced to a large degree by the US DOE ARPA-E program. It has modelled globally where seaweed farms would be most productive and protected.

Another innovation of the project will be linking communities to a blue carbon market, whereby they can access credits for engaging in seaweed farming. The project will support a proof of concept for this innovative market tool.

Sustainability

The project will build on Viet Nama strong baseline of existing government and partner programs and initiatives, and by the involvement of relevant stakeholders (including communities and private sector) in project development and implementation. By building on these capacities, the project will ensure long-term sustainability. In this regard, the programme will address the following key parameters of sustainability:

Institutional Sustainability:

The project will ensure institutional sustainability at the global to local level to ensure that experiences, lessons learned, and best practices generated by the project are maintained within the communities, NGOs, and government structures.

- **National:** The project will ensure a participatory design process followed in the preparation of this project. As the officially designated agencies for this area of work, participating agencies' mandates stretch beyond the period of the project, ensuring continuity. In addition, the project will work with existing national seaweed industry associations and cooperatives, which will continue their mandates and will support mainstreaming of project results and best practices with their members.
- **Global:** The project will work with the Global Seaweed Coalition, which will continue to provide a coalition of actors towards sustainable seaweed value chains.
- **Regional:** As the lead executing agency, SEAFDEC will support mainstreaming of project results at the regional level.

Financial Sustainability:

The project builds strongly on the existing programs and initiatives, at both national and local level. In the Philippines, the cooperatives the project will work with have been established and are assisted by BFAR. This support will continue beyond the scope of the project. Secondly, one of the areas of focus is to demonstrate and prove viable models for community and private sector led approaches that would form the basis of a sustainable expansion of seaweed markets and production, with the key objective of ensuring that the landscape plans and investments proposed under the project will become self-sustainable. The demonstration farms undertaken by the project are expected to have a positive cash flow by the end of the project, allowing the seaweed farming to not only continue but scale up (see below). Finally, the project will develop bankable proposals and host investment seminars to help finance the development of seaweed value chains.

Social sustainability:

The engagement of non-governmental stakeholders, including communities, the private sector, and multilateral development banks, is a key factor in assuring the long-term sustainability of GEF investments in the sector. In this regard, a considerable part of the project is dedicated to enhancing community and private sector participation in sustainable marine and coastal management, including the establishment of the necessary incentive and benefit-sharing systems that are crucial to ensure their longer-term engagement.

Scaling up

By linking field level interventions with national level policy dialogue and capacity building at local and national level, the project is also set to lay the foundations for up-scaling sustainable seaweed markets, by developing new technologies that can be easily replicated and disseminated. In addition, tools developed by the project, such as the Sustainable Seaweed Toolkit, can be scaled up and applied at the regional and global level.

The project will develop a knowledge management and communication strategy during project development to support scaling up of project results, to be supported by existing networks (SEAFDEC, Global Seaweed Coalition) and partners during execution.

[1] For this project, regional refers to Southeast Asian countries that farm seaweed.

[1] <https://www.worldwildlife.org/pages/impact-investing>

[2] <https://english.vietnamnet.vn/fms/environment/174761/seaweed-farming---a-promising-industry-and-solution-to-pollution.html>

1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.

Figure 1: Philippines. Shortlisted target sites include Balabac in southern Palawan, Malampaya and Taytay in Northeastern Palawan, Zamboanga in Mindanao

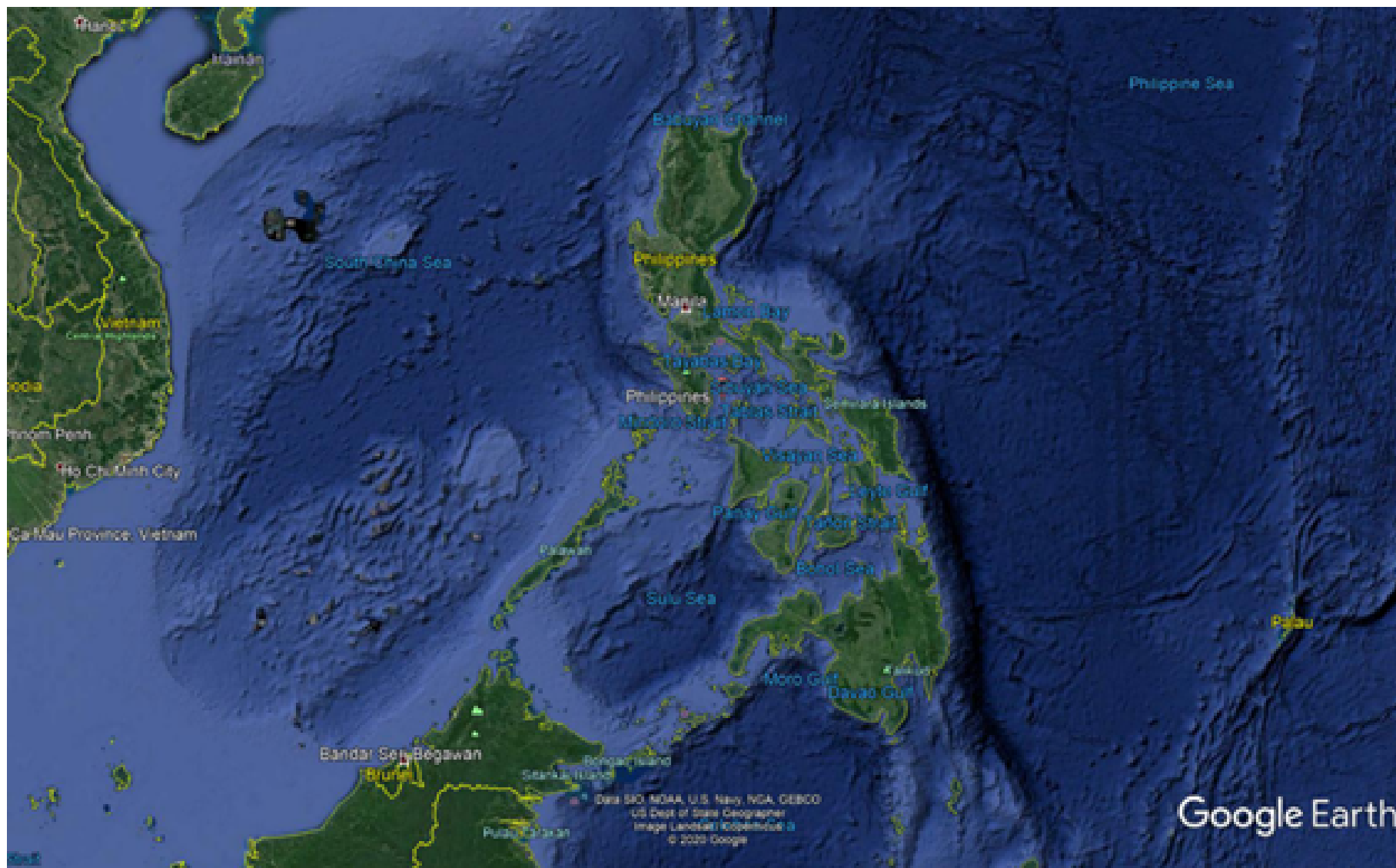


Figure 2: Viet Nam. Target sites will be identified in PPG Phase. Identified priority provinces for offshore marine aquaculture include Kien Giang, Phu Yen, Khanh Hoa, Quang Ninh, Hai Phong, Ba Ria - Vung Tau, Ninh Thuan and Binh Thuan, Binh Dinh, Ca Mau.

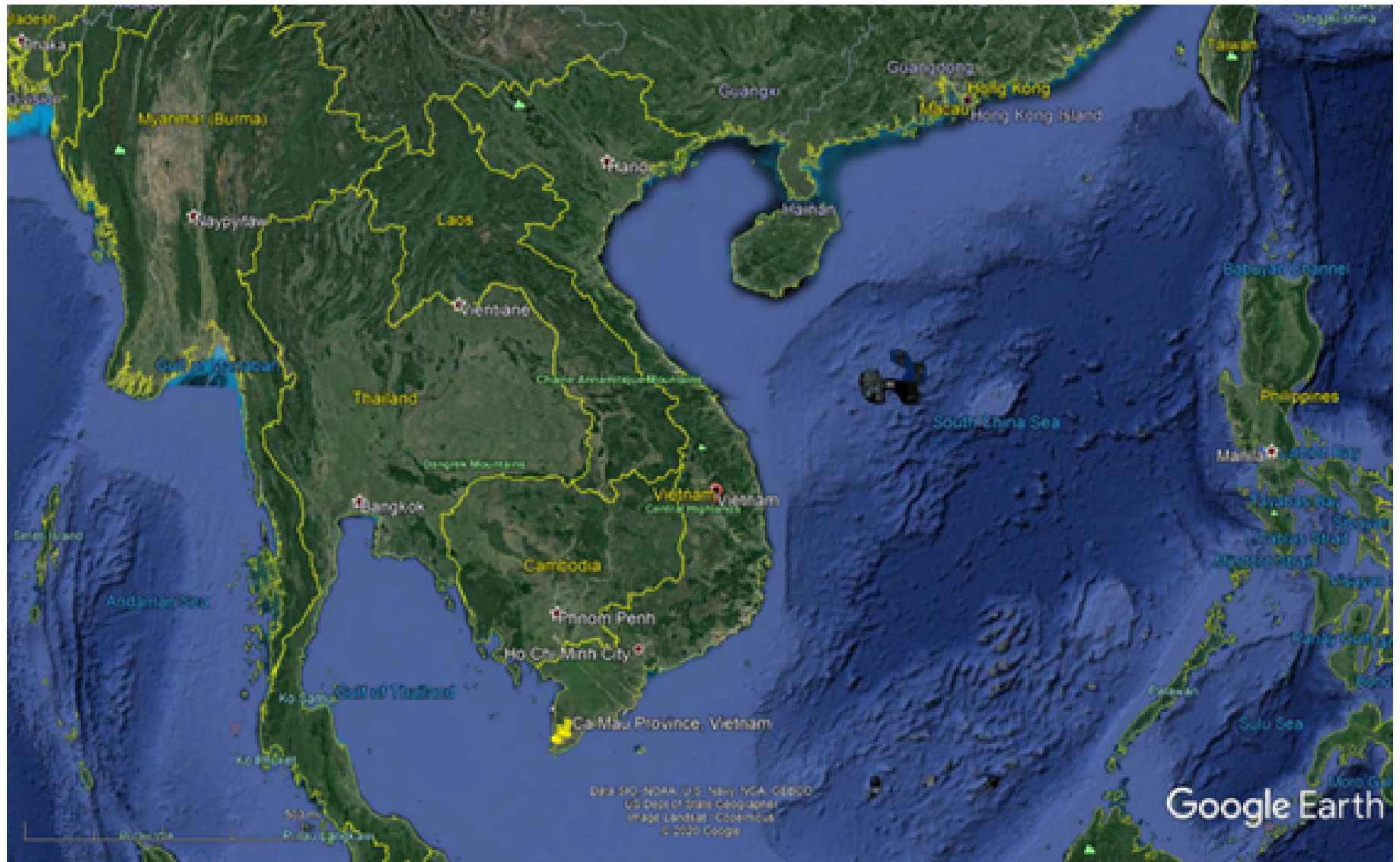


Figure 1. Map showing Philippines and surrounding seas

Figure 2. Map showing Vietnam and surrounding seas

2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Indigenous Peoples and Local Communities No

Civil Society Organizations Yes

Private Sector Entities Yes

If none of the above, please explain why:

In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement.

During PIF development, the project team engaged with stakeholders at the regional and national level in February-September 2020. Global/Regional stakeholders included Lloyds Register Foundation, World Bank, the Executing Agency, Cargill, Mars, Nestle, USAID, ARPA-e, Grantham Family Trust, Walton Family Foundation, Ocean2050, Skretting, OceanKind, and the Moore Foundation. In Vietnam, Department of Fisheries, VASI, MCD, ICAFIS and VISI were engaged and contributed towards the PIF. In Philippines, stakeholders engaged include BFAR, Philippines Foreign Assisted Special Projects (FASPs), and Philippine Seaweed Association.

During project development, the project will continue to engage stakeholders at the regional, national, and community level. An indicative list of these stakeholders – and the roles that they will play in project design – is provided in Table 1 below. The stakeholders and their respective contributions and roles in the project will be confirmed during the project development phase. The project will also ensure that representatives of relevant initiatives and projects are regularly consulted with to enhance effective and informed collaboration during the project development and implementation phases.

Table 1. List of potential key stakeholders and their possible contributions and roles in the proposed project.

Stakeholder type	Stakeholder list	Possible contributions and roles in the project
Government ministries (at central and provincial levels)	<ul style="list-style-type: none">● Viet Nam:<ul style="list-style-type: none">o MARD– Department of Aquaculture (seaweed production; sector planning); Department of Capture Fisheries (MPAs)o MONRE – Viet Nam Administration of Seas and Islands (VASI); Viet Nam Institute of Seas and Islands (VISI)● Philippines:<ul style="list-style-type: none">o BFAR	Beneficiaries of capacity-building; national coordination of activities; input to seaweed development plan and other national plans/coordination mechanisms.
Community-level stakeholders	<ul style="list-style-type: none">● Coastal communities and seaweed farmers, including women	Delivery of project activities (demonstration farms under Component 3); beneficiaries of stre

	<ul style="list-style-type: none"> Seaweed cooperatives <p>Seaweed Industry Association of the Philippines (SIAP)</p> <p>Marine Aquaculture Association of Viet Nam</p> <ul style="list-style-type: none"> CBOs 	<p>ngthened seaweed industry and technologies</p>
CSOs	<ul style="list-style-type: none"> World Wide Fund for Nature (WWF) Viet Nam and WWF Philippines MCD ICAFIS 	<p>Provision of technical advice; delivery of training and assets; social mobilisation; monitoring of ecological conditions.</p>
Private Sector	<ul style="list-style-type: none"> Cargill, Mars, Nestle 	<p>Will help advance new value chains at the global level, may help finance bankable proposals towards biorefinery. Will be actively engaged in the Global Seaweed Coalition.</p>
Research institutions	<ul style="list-style-type: none"> Viet Nam: Hai Phong Institute of Natural Resources and Environment, Institute of Biotechnology, Nha Trang Oceanography Institute, Nha Trang Institute of Technology Research and Application (Viet Nam Academy of Science and Technology), Aquaculture Research Institutes I, II and III; Seafood Research Institute. Philippines: relevant research institutions will be identified and engaged (UP Marine Science Institute, BFAR, National Fisheries Research Development Institute, University of San Carlos, Mindanao State University-TCTO. SEAFDEC/AQD. 	<p>Provision of scientific support; undertaking of research activities related to seaweed production and processing technologies.</p>

3. Gender Equality and Women's Empowerment

Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).

In Viet Nam, though there have been many official efforts over the years to support women's rights, patriarchal attitudes and deep-rooted gender stereotypes with respect to the responsibilities and roles of women and men in society result in more subordinate roles of women. These social norms limit women's access to certain types of careers. Although women have a high labour participation rate, they work in sectors where they are poorly paid and undervalued. Women are likely to work in agriculture or small business run by their own families. In such work, health and social insurance is not covered and employees must cover it themselves if they choose to. The result is that few women engaged in this type of work have any form of social security. While not specific to seaweed, one gender analysis looking at aquaculture in Viet Nam notes that women are often more involved in processing and marketing. It also noted that women's labour in aquaculture is often underreported, and is done concurrently with domestic responsibilities.^[1]

There are considerable opportunities to advance the gender agenda in Viet Nam. There is a growing civil society, and particularly women's rights organizations, that are holding government accountable to national as well as international commitments. There are several provisions for women's rights in the Vietnamese constitution and in several laws that have been passed over the years. The Socio-Economic Development Plan (SEDP) 2016-2020 aspires to build an inclusive and sustainable development model balancing economic, social and environmental imperatives so that all citizens benefit from development gains.^[2]

The situation in the Philippines is similar, in that there have been many official efforts to combat gender inequality through both national laws and international commitments. Despite a favourable policy environment – the Philippines is signatory to international human rights instruments and has successfully enacted policies and laws for the protection and promotion of women's rights - the implementation of policies appears uneven and slow. The International Labor Organization (ILO) reports that less than half (45.9%) of working age women are able to access decent and productive employment, compared to 3 in every 4 men (72.6%) of working age. In the agricultural sector, men receive 20% higher wages than women.^[3] For seaweed farming in the Philippines, women are often highly involved. In Palawan, one of the shortlisted project sites, women comprise more than half of the seaweed farmer. In terms of responsibilities, men typically support seaweed cultivation and bring the seaweed to shore, while women support harvesting and drying of the seaweed alongside household roles.^{[4][5]} Men often make decisions on the operations of the seaweed farms (68%). Women do support decision around selling of seaweed and input procurement.^[6]

Asia is estimated to have the highest total coastal population exposure. Current and future trends (Neumann et al, 2015) points towards a need for rapid advances within youth empowerment (special focus on women) and the creation of quality jobs at scale in coastal areas, while enhancing the ability of coastal populations to adapt to an increased frequency of extreme climate events (e.g. coastal flooding). This project will deliver on this agenda via new climate resilient value chains, which should not merely contribute to the creation of new jobs that pay marginally above the poverty line (\$1.90-a-day threshold), but should hold the promise of bringing large coastal populations into a middle-income existence. New policies, coastal value chains and adaptive planning for building resilient coastal communities is not only desirable, but essential, if we are to increase the decency of living, combat illiteracy, strengthen democratic values, and curb emergency migration.

By the virtue of the structure of the current global seaweed industry, women are poised to benefit the most from this development. The global seaweed sector is dominated by women (numbers range from 60% in Indonesia to 75-80 % in Zanzibar). The successful execution of this project will not only help move women and families out of poverty via the creation of new global value chains, it will also act to solidify progress made to date by deploying new climate resilient strategies into the existing global sector – thereby creating a solid foundation for women's socio-economic empowerment.

The biggest interest for economic growth is coming from women who farm seaweed, however, coastal communities are seeing lower returns from capture fisheries, and there is a desire to increase medium-scale seaweed farming businesses to create greater connectivity and control in the supply chain. By empowering women to bring larger, more efficient and more profitable farms on line, seaweed production will also support fishing communities by reducing algal blooms that shade reefs, allow for grazers such as abalone and crustaceans to flourish and provide habitat and shelter for juvenile and breeding fish that are often overexploited. In short, this project will in part be a demonstration of how to improve the lives of coastal women and their families by getting them out of poverty through a circular, vibrant blue economy.

Through the project, women will be engaged in numerous activities including:

- Through project-supported seaweed clubs and associations (Component 2), which will be important for developing national seaweed plans and marine spatial plans
- In project demonstration farms, where women and men will be engaged to support proof of concept for offshore seaweed aquaculture (Output 3.1.1)
- In proof of concept for carbon credit model (output 3.2.1), where women are vital for recording relevant statistics from the farm level, and whose livelihoods will benefit from the carbon credit system
- Women will be a key contributor to the Sustainable Seaweed Toolkit, and will be invited to associated trainings (3.2.2).
- For biorefinery solutions (Output 3.3.1), in their involvement in the assessment of the feasibility of biorefinery solutions, and once established, these biorefinery solutions will provide greater market access for women (by removing the middle-man, and providing direct access to markets)
- The stakeholder engagement plan and knowledge management strategy (developed under Component 4) will ensure active engagement with women, and key knowledge products will be shared with women and men

The project will follow the WWF GEF Gender Policy, which is aligned with the GEF Policy on Gender Equality throughout the development and implementation of the proposed project. During project development, a gender analysis and action plan will be undertaken to identify gaps, opportunities, and entry points to mainstream gender in all components of the project. The Gender Analysis will provide a more detailed picture of women and men's role in the seaweed value chain. The Gender Action Plan (GAP) will provide recommendations to ensure all activities are gender responsive, including a gender-sensitive monitoring plan to track progress against the GAP. Gender-responsive stakeholder consultations will be conducted throughout the lifetime of the project.

[1] <http://www.fao.org/3/a-at243e.pdf>

[2] https://www.undp.org/content/dam/vietnam/docs/Publications/gender%20strategy_UNDP%20VN.pdf

[3] <https://www.undp.org/content/dam/philippines/docs/Governance/fastFacts%20-%20Gender%20Equality%20and%20Women%20Empowerment%20in%20the%20Philippines%20rev%201.5.pdf>

[4] Abano, 2019. <https://www.eco-business.com/news/philippines-small-scale-women-seaweed-farmers-ride-the-rough-tides-of-climate-change/>

[5] <https://newsinfo.inquirer.net/1126027/fishers-wives-earn-at-seaweed-farms>

[6] https://ir.library.oregonstate.edu/concern/parent/6969z1869/file_sets/cr56n1958

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment? Yes

closing gender gaps in access to and control over natural resources; Yes

improving women's participation and decision-making; and/or Yes

generating socio-economic benefits or services for women. Yes

Will the project's results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Will there be private sector engagement in the project?

Yes

Please briefly explain the rationale behind your answer.

As the project is building seaweed value chains, the project relies on active private sector engagement and buy in – from national industry associations to global buyers and financiers.

The project will directly engage private sector actors through several outputs.

- Under output 1.1.1, the project will support Lloyds Register Foundation with operationalizing a Global Seaweed Coalition. This Coalition will support an industry standard around food safety and labour for the seaweed industry. This will include integration into private sector operations and value chain standards.
- Seaweed Industry Associations and farmer clubs will be engaged in Philippines and Viet Nam. These associations and farmer clubs will be engaged in the marine spatial planning/zoning process, provide an avenue for sharing/contributing to project products (e.g. 3.2.2: Sustainable Seaweed Toolkit and trainings), and will be important in developing the project demonstration farms (3.1.1).
- The project will engage the finance sector, both through the Global Seaweed Coalition and through Outcome 3.3. Specifically, the project will (i) develop bankable business propositions to encourage investment in biorefinery solutions for new priority seaweed products, and (ii) fund investment seminars to facilitate investment into seaweed value chains. Private sector engagement is also integrated into other project components - the project will work with private sector through the Sustainable Roundtable on Sustainable Seaweed and by promoting adoption of best practices and standards across seaweed value chains.
- The project will engage global private sector actors who are pivotal in advancing new value chains at the global level, including Cargill, Mars, and Nestle.

5. Risks to Achieving Project Objectives

Indicate risks, including climate change, potential social and environmental risks that might prevent the Project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the Project design (table format acceptable)

#	Identified risk	Level	Potential consequence	Counter measure
1	High turnover of staff members in implementing and executing agencies.	Likelihood: Medium Impact: medium	This could lead to a loss of institutional knowledge regarding project interventions, and less effective implementation.	<ul style="list-style-type: none"> Relationships with the appropriate individuals in respective government bodies will be established through clear institutional mandates for roles and responsibilities in the project A knowledge management platform and will be developed to facilitate the transfer of knowledge regarding project interventions.
2	Capacity constraints of local and national institutions to undertake the required project interventions.	Likelihood: Medium Impact: Medium	Project interventions could be delayed and there may be insufficient capacity to overcome potential implementation challenges.	<ul style="list-style-type: none"> Institutional and technical capacities of government line departments will be built.
3	Insufficient supply and/or distribution/accessibility of good quality planting materials including disease-resistant seedlings. And/or disease outbreaks	Likelihood: Low Impact: Medium	Delays in timeline of project	<ul style="list-style-type: none"> Further research into disease-resistant strains in addition to mitigation of spread Increased investment in creating sufficient supply/accessibility of good quality planting materials The project may support seaweed nurseries to supply quality propagules
4	Unfavourable climate conditions, such as extreme weather events (like El Niño) or typhoon	Likelihood: Medium	Could result in implementation delays for proof of concept farms	<ul style="list-style-type: none"> Demonstration farms and site selection will be based on climate conditions, including seasonal variations

	risks caused by climate change	Impact: Low		<ul style="list-style-type: none"> • Adjustment of toolkits • Technology developed that encompasses and accounts for the risks posed by climate change related weather events
5	Conflict between small and medium scale seaweed farmers (offshore seaweed farms typically require medium scale operations)	Likelihood: Medium Impact: Medium	This could exacerbate inequalities within seaweed farming communities, and reduce the ability of the project to work with the communities as a whole to strengthen seaweed value chains.	<ul style="list-style-type: none"> • The project will undertake stakeholder consultations to ensure the project benefits the seaweed farmer communities equitably. • The project will work with seaweed cooperatives to allow access from small and medium scale seaweed farmers
6	COVID-19 affects project development and execution	Likelihood: High Impact: Medium	Could result in project development and implementation delays, including work with the communities on seaweed demonstration farms and activities around community livelihoods/benefits, as well as national and regional workshops/trainings	<ul style="list-style-type: none"> • Regional workshops & trainings can be held remotely • Process for implementing proof of concept farms may be adjusted • Consultation and engagement with local communities will be done virtually where possible, or by locally/regionally designated partners <p>A detailed COVID-19 analysis has been provided as a supporting document</p>

6. Coordination

Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.

Institutional Structure:

Lead Executing Agency: SEAFDEC, a regional intergovernmental organization, will be the lead Executing Agency of this project. SEAFDEC will house the Project Management Unit, which is responsible for the day-to-day management of the project. The PMU will include a Project Manager, a Monitoring and Evaluation Officer, and a Finance and Administration Officer. The PMU will be responsible for overall fiduciary oversight, and will subgrant funds to the relevant government ministries in Viet Nam and the Philippines for delivery of national-level activities (MARD and MONRE in Viet Nam, and BFAR in Philippines). The PMU will also be responsible for monitoring and evaluation activities under the project. This includes reporting to the WWF GEF Agency (biannual project progress reports, quarterly financial reports, tracking against annual workplan and results framework). Independent consultants will be recruited to undertake the midterm and terminal evaluation of the project.

M&E item	Frequency	Responsible	Reporting to
Results Framework monitoring (and core indicator monitoring)	Annual	PMU (M&E Officer, Project Manager) with support from partners	WWF GEF Project Manager
Work plan tracking	Annual	PMU (M&E Officer, Project Manager) with support from partners	WWF GEF Project Manager
Annual reflection meetings	Annual	M&E Officer with support from Project Manager	N/A
Field reporting	Quarterly	Field team	PMU
Project Progress Report	Bi-annual (twice a year)	Project Manager with support from PMU and partners	WWF GEF Project Manager
Project Close Report	Once - project close	Project Manager with support from PMU and partners	WWF GEF Project Manager
Midterm Evaluation	Once – project midterm	Independent Consultant	WWF GEF M&E Specialist, IEO
Terminal Evaluation	Once – project close	Independent Consultant	WWF GEF M&E Specialist, IEO
Project Implementation Report	Annual	WWF GEF Project Manager	GEF Secretariat

Project Partners: SEAFDEC will provide coordination at the regional level and will work with regional and international partners to ensure integration with baseline initiatives (e.g. Lloyds Registry Foundation). In Viet Nam, the project will be supported by MARD and MONRE. In Philippines, the project will be supported by BFAR. MARD, MONRE and BFAR will lead execution of activities within the respective countries, this may include subgranting to project partners. A final list of project partners will be identified during project development.

Project Steering Committee: Project oversight and strategic guidance will be provided by a national Project Steering Committee (PSC). The PSC will include SEAFDEC, MARD, MONRE, BFAR, and other key partners as identified during PPG.

GEF Agency: The WWF GEF Agency will provide implementation support and supervision, including review of project progress reports and financial reports and annual supervision missions (with visits to the project and project field sites to assess project progress and monitor compliance with WWF Safeguards Policies and adherence to all other WWF and GEF policies..

Coordination with other GEF-projects and other initiatives:

The project will coordinate with GEF and non-GEF projects being implemented in Philippines and Viet Nam focused on coastal and marine resource management. The project will build on key baseline projects and initiatives (see section on baseline) and coordinate with key stakeholders and partners (see stakeholder section) to: i) benefit from lessons learned; and ii) effectively leverage relevant activities to maximise efficiency and impact.

In particular, the project will coordinate with and ensure integration with the following investments by GEF and large multilateral organizations:

- The World Bank and PROBLUE market study for new seaweed products
- The UNEP Regional Seas Program (COBSEA), which supports implementation of National Action Plans towards the South China Sea Large Marine Ecosystem Strategic Action Plan and the Sulu Celebes Large Marine Ecosystem Action Plan.
- The UNEP GEF Project “Standardized Methodologies for Carbon Accounting and Ecosystem Services Valuation of Blue Forests,” which has produced assessments of carbon and ecosystem services associated with “blue forests,” including seagrass meadows. The project will build on the knowledge, methodologies and best practices of the project.
- The project aligns well with the South China Sea SAP, which clearly identifies unsustainable aquaculture as a key threat to the SCS region (for example, on mangroves and seagrass, as well as coastal pollution). The project will support sustainable seaweed production, which captures CO₂, harmful pollutants, and helps reduce salinity.

7. Consistency with National Priorities

Is the Project consistent with the National Strategies and plans or reports and assessments under relevant conventions

Yes

If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc

National Strategies/Plans	Alignment
Viet Nam	
Viet Nam Seaweed Development Plan	<p>The Plan outlines seaweed development oriented towards:</p> <ul style="list-style-type: none"> • Developing Agar-Agar, kappa- carrageenan and other high value seaweed products • Emphasis on Eucheuma farming technology with a variety of system types (bottom monoline, floating bamboo, net-bag technique etc.) • Investments in semi-intensive and intensive systems • Promoting research and development of seaweed to meet consumer needs and applications of carrageenan • Development of industrial-scale seaweed with integrated value chains • Expand seaweed farming in lagoons and islands
Resolution on the strategy for the sustainable development of Viet Nam's marine economy by 2030, with a vision to 2045 (Resolution No. 36-NQ/TW)	<p>Among other aspects, the Resolution orients Viet Nam's Marine Economy towards "developing the marine economy sustainably on the basis of green growth and conservation of biodiversity and marine ecosystems; ensuring harmony between economic and natural ecosystems, between conservation and development, and between the interests of coastal and landlocked localities".</p>
Viet Nam MSP Planning Law (Law No. 21/2017/QH14 dated November 24, 2017)	<p>The stated aim of the national MSP is to ensure the efficient and sustainable exploitation of marine and island resources on the basis of multisector planning and management. MSP allows for a</p>

	more ecosystem-based approach to planning and to identifying a nd mitigating user use conflicts in the marine space, and forms t he legal basis for sectors, branches, and localities to align or adj ust all plans related to the exploitation and use of marine space
Marine Aquaculture Strategy to 2030	Under MARD, the marine aquaculture strategy is oriented toward s sustainable production, technological expansion, climate chan ge adaptation, eco-certification and the gradually shift of product ion models to the offshore. Identified priority provinces for offsh ore marine aquaculture include Kien Giang, Phu Yen, Khanh Hoa, Quang Ninh, Hai Phong, Ba Ria - Vung Tau, Ninh Thuan and Binh Thuan , Binh Dinh, Ca Mau. The strategy targets 400,000 MT of s eaweed production by 2030, of which 100,000 MT will come fro m offshore operations.
Sustainable Development Goals	Viet Nam is committed to the Sustainable Development Goals, in cluding goals (1) ending poverty, (2) gender equality, (3) responsi ble production.
Philippines	
Sustainable Development Goals	The Philippines is committed to the Sustainable Development Go als, including goals (1) ending poverty, (2) gender equality, (3) res ponsible production.
National Science and Technology Plan for Sea weed	Includes milestones/targets for 2020, including interventions on research and development, promotion of technology transfer, poli cy, and capacity building. ^[1]
Philippine Seaweed Development Authority Act – proposed/filed 2018	This would establish a Philippine Seaweed Development Authorit y to promote “the rapid, integrated development and growth of th e seaweed industry in all its aspects and to ensure that the seaw eed farmers become direct participants in, and beneficiaries of, s uch development and growth.” This bill has not yet been enacted into law.
Seaweed Carrageenan Roadmap	The Seaweed/Carrageenan Industry Roadmap 2016-2020, focus ed on two major red seaweeds species produced namely, Eucheu ma and Kappaphycus. The roadmap was spearheaded and imple mented by the Department of Trade and Industry (DTI)

BFAR National Seaweed Development Program (NSDP)	<p>Masaganang Sakahang Pandagat (MSP)- Seaweed Livelihood Development Program 2017-2022</p> <p>The seaweed roadmap includes 3 components: (1) Improved/increased production; (2) organized seaweed farmers; and (3) promotion/commercialization of seaweed products.</p>
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[1] <http://www.pcaarrd.dost.gov.ph/home/isp/images/matrices/seaweeds.pdf>

8. Knowledge Management

Outline the Knowledge management approach for the Project, including, if any, plans for the Project to learn from other relevant Projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

Knowledge management will be supported under Component 4 of the project. Lessons learned, best practices, and guidance notes for scaling up will be collated and disseminated according to a communication strategy developed during project development. In particular, the project will develop/publish (i) best practices and standards for seaweed value chains via a knowledge platform, (ii) off-shore seaweed production methodologies supported by the project to ensure these technologies can be replicated and scaled up in other parts of the region as well as globally by private sector actors, (iii) Lessons on improved zoning, private sector engagement, feasibility of carbon markets, supply demand models for different seaweed products, (iv) a seaweed toolkit, and (v) annual global seaweed coalition communication briefs.

Further details of the project’s approach to knowledge management will be determined during the project development phase in consultation with the relevant stakeholders.

9. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

Overall Project/Program Risk Classification*

PIF	CEO Endorsement/Approval	MTR	TE
Medium/Moderate			

Measures to address identified risks and impacts

Provide preliminary information on the types and levels of risk classifications/ratings of any identified environmental and social risks and potential impacts associated with the project (considering the GEF ESS Minimum Standards) and describe measures to address these risks during the project design.

The project has preliminarily been screened as a medium risk (B) project for environmental and social safeguards. The safeguards risk categorization is based on current available information on the project design and the project location. A full safeguards categorization and screening will be undertaken during project development once activities have been explicitly defined and specific locations determined. The safeguards categorization memo will be issued based on the screening. Any safeguards management plans or measures to address the identified risks will be developed during the project development phase.

Supporting Documents

Upload available ESS supporting documents.

Title	Submitted
ESS PIF pre-screen_Blue Horizon	

Part III: Approval/Endorsement By GEF Operational Focal Point(S) And Gef Agency(ies)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).

Name	Position	Ministry	Date
Nguyen Duc Thuan	GEF OFP, Director of Vietnam Environment Protection Fund	Ministry of Natural Resources and Environment	3/20/2020
Ms. Analiza Rebuelta - Teh	GEF OFP, Undersecretary Finance, Information Systems and Climate Change	Department of Environment and Natural Resources	10/27/2020

ANNEX A: Project Map and Geographic Coordinates

Please provide geo-referenced information and map where the project intervention takes place

Figure 1: Philippines. Shortlisted target sites include Balabac in southern Palawan, Malampaya and Taytay in Northeastern Palawan, Zamboanga in Mindanao



Figure 2: Viet Nam. Target sites will be identified in PPG Phase. Identified priority provinces for offshore marine aquaculture include Kien Giang, Phu Yen, Khanh Hoa, Quang Ninh, Hai Phong, Ba Ria - Vung Tau, Ninh Thuan and Binh Thuan, Binh Dinh, Ca Mau.

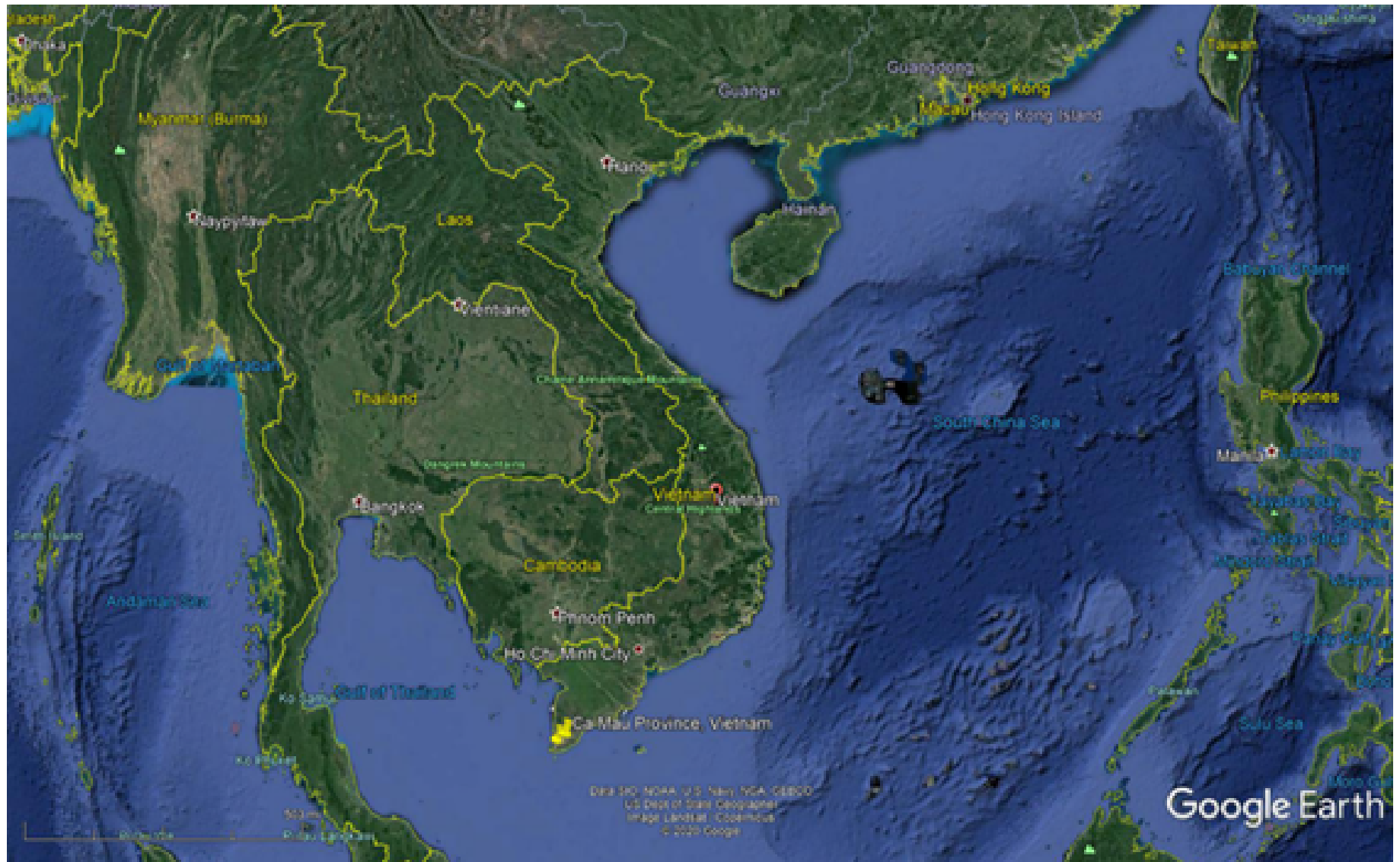


Figure 1. Map showing Philippines and surrounding seas

Figure 2. Map showing Vietnam and surrounding seas

