

Norwegian Blue Forests Network

LANDSCAPE MAPPING BLUE FORESTS POLICY IN NORWAY



Abstract

“Blue forests” are coastal and marine habitats that have the ability to store carbon and provide a range of important ecosystem services for coastal communities. Blue forests are considered integral ecosystems for biodiversity and the development of sustainable food sources and materials.

Within Norway, interest in the blue forests concept is growing. However, the domestic and international initiatives and projects supported by the Norwegian Government have yet to be condensed into a singular strategy. Within this context, a series of stakeholder interviews were conducted to identify relevant projects and to gain an understanding of the potential opportunities and perceptions regarding blue forests policy in Norway. This report presents a first-level landscape map and data set of the blue forests projects supported by the Norwegian Government in 25 countries around the world, with a combined budget of approximately 327 million Norwegian kroner. Overall, the findings presented within this initial assessment will allow relevant policymakers to evaluate current priority areas and consider future opportunities for blue forests policy in Norway.

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Abbreviations

CBD	Convention on Biological Diversity
CORDIS	European Union Community Research and Development Information Service
EU	European Union
IMR	Institute of Marine Research
KLD	Norwegian Ministry of Climate and Environment
LDC	least-developed countries
MPA	Marine Protected Areas
NBFN	Norwegian Blue Forests Network
NFD	Norwegian Ministry of Trade, Industry and Fisheries
NIVA	Norwegian Institute for Water Research
NOK	Norwegian kroner (currency)
NORAD	Norwegian Agency for Development and Cooperation
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
RAMSAR	Convention on Wetlands (UNESCO)
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SDG	Sustainable Development Goal (UN)
SIDS	small island developing state
UN	United Nations
UNEP	United Nations Environment Programme
WWF	World Wide Fund for Nature



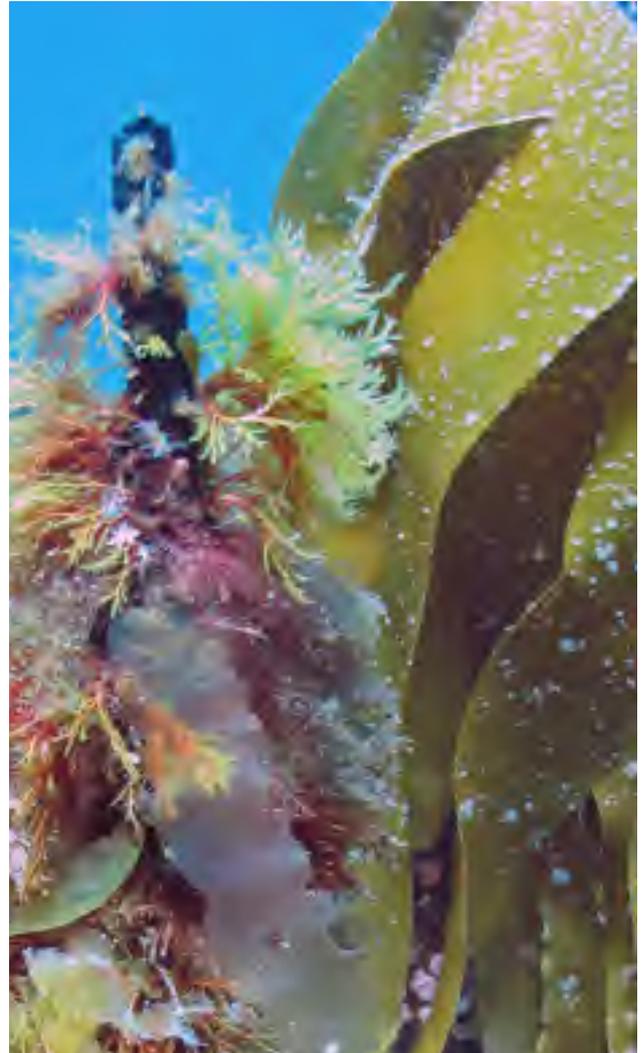
Executive summary for policymakers

“Blue forests” are marine and coastal ecosystems that have the ability to store carbon and provide important ecosystem services for coastal communities around the world. These services include protecting shorelines, filtering water and supporting food security and marine biodiversity.

The Norwegian Government’s recognition of the value of blue forests has been communicated by various strategies and policies concerning environmental protection, foreign aid and economic development. The Government has financially supported various domestic and international blue forests projects over the years. However, these projects have yet to be condensed into a singular blue forests strategy.

This assessment aims to provide a first-level identification of the international and domestic blue forests projects supported by the Norwegian Government from 2015 to the present. Civil society and policy and management stakeholders were interviewed to collect project information, and participants also offered compelling insight into the state of blue forests policy in Norway.

The overall finding of this report shows that there is positive support within the Norwegian Government for blue forests policy, as evidenced by the granting of approximately 327 million Norwegian kroner towards blue forests projects in 25 countries around the world (see map below). Of this sum, 80.7 per cent was used for domestic projects and 19.3 per cent for international projects.



Interviewee recommendations

By suggesting recommendations and identifying potential opportunities, participants offered insight as to how they believe blue forests policy can be advanced within Norway. These recommendations can be summarized by the following six points:

- 1. Increase scientific research:** There are still gaps within blue forests knowledge that require research, particularly regarding the potential capacity of carbon storage in kelp forests.
- 2. Increase national mapping:** A nationwide mapping programme would allow for enhanced monitoring and comprehensive integrated management plans to preserve and protect blue forests along the Norwegian coastline.
- 3. Expand international carbon frameworks:** Natural carbon storage of blue forests should be incorporated into international target-setting frameworks and implemented in a way that avoids double-counting of emissions.
- 4. Collaborate:** Managing and researching blue forests requires additional collaboration between diverse stakeholders – particularly between scales of governance. This also includes additional dialogue with the cultivated macroalgae sector to explore the potential ecosystem services that cultivated macroalgae can provide.
- 5. Value ecosystem services:** Financial mechanisms should recognize the value of the ecosystem services provided by blue forests, although the capacity of Reducing Emissions from Deforestation and Forest Degradation (REDD+) to incorporate blue carbon on a wide scale is disputed.
- 6. Increase understanding of blue forests:** Knowledge of blue forests needs to be disseminated through outreach to multiple sectors, including the public, students, fisheries and decision makers.





1. Introduction

1.1 Background

The ocean is recognized as the most vital ecosystem for sustaining human and non-human life on Earth. As we embark on the United Nations Decade of Ocean Science, our marine resources are under immense pressure because competing interests continue to use oceans at an increased rate (Visbeck 2018). The ocean provides economic opportunities, supports biodiversity, increases global food security and regulates our climate by protecting against the impacts of global climate change and absorbing carbon (Intergovernmental Panel on Climate Change [IPCC] 2013).

Along global coastlines, “blue forests” are particularly efficient at storing carbon. These coastal and marine habitats include mangrove forests, kelp forests, seagrass meadows and salt marshes. Of these, vegetated coastal habitats are estimated to bury 70 per cent of the carbon sequestered in oceans, despite only comprising 0.5 per cent of the ocean’s surface area (McLeod *et al.* 2011).

The term “blue carbon”, introduced by the United Nations Environment Programme (UNEP) in 2009, is defined as the carbon captured by living marine organisms (Nellemann *et al.* 2009). “Blue forests” later emerged as a term to recognize the value of blue carbon and the other important ecosystem services that coastal habitats support, as this report will highlight. The term itself is thought to be in flux and may be conflated with blue carbon; however, it has been adopted by multiple parties including the Global Environment Facility, UNEP and partners via the Blue Forests Project; the Arabian Blue Forests Working Group, which was formed in 2019 to promote research in coastal carbon systems throughout the Arabian Peninsula region; and the Indian Ocean Rim Association via a recent webinar to highlight sustainable blue forest economy solutions.

BLUE FORESTS are the coastal and marine ecosystems that sequester carbon and provide a multitude of ecosystem services and co-benefits.

BLUE CARBON refers to the carbon stored in the biomass and sediments of blue forests.

The many co-benefits of blue forests – beyond carbon sequestration – include: protection from erosion, storm surge and flooding (Madsen *et al.* 2001; Costanza *et al.* 2014); water filtration through the absorption of nutrients and sediments (Gundersen *et al.* 2017); supporting ocean biodiversity (Lau 2013); providing nutrients and habitats for fish and crustaceans (Norderhaug *et al.* 2005); and providing sustainable resources, such as food for humans and animals, and materials for building or ingredients for medicine and cosmetics (Gundersen *et al.* 2017).

Due to the abundance of blue forests in Norway and the co-benefits they provide, there is growing national interest in preserving, restoring and, in some cases, cultivating them. Indeed, the cold-temperate and arctic zones of the Norwegian coastline are optimal areas for macroalgae cultivation (Skjermo *et al.* 2014) and it is estimated that, by 2050, Norway will be able to produce 20 million tons of macroalgae, with an annual value of 40 billion Norwegian kroner (Olafsen *et al.* 2012).

Given the growing interest in macroalgae cultivation (Solsletten 2018), there is an ongoing debate as to whether cultivated kelp and seaweed should be included within the wider definition of blue carbon or blue forests. The terms blue carbon and blue forests have historically only pertained to natural ecosystems. However, the cultivation of kelp does not occur in a vacuum – cultivated macroalgae and the hard substrate from anchors and canopies can become part of an ecosystem (Wood *et al.* 2017), and the most recent report of the High Level Panel for a Sustainable Ocean Economy notes that the creation of artificial habitats and nursery grounds for fish can potentially improve wild fisheries (Stuchtey *et al.* 2020). Thus, for the purposes of this assessment, projects related to the commercial cultivation of macroalgae and kelp will be included within landscape maps and blue forest project totals.

The Norwegian Government’s recognition of the value of blue forests has been communicated by various reports and strategies (the Ocean Strategy 2017; Meld. St. 4 2018–2019; Meld. St. 20 2019–2020; Prop. 1 S 2018–2019; Prop. 1 S 2019–2020; the Long-Term Plan for Research and Higher Education 2019–2028). In addition, blue forests are highlighted in Norwegian foreign development strategies, with the Government noting in 2017, “Norway supports blue forest ecosystem projects in order to improve management and involve local coastal communities in fighting poverty by promoting sustainable use” (Meld. St. 22 2016–2017).

Norway also co-chairs the High-Level Panel for a Sustainable Ocean Economy with Palau, a 14-country panel formed in 2018 to provide diverse economic and political perspectives on oceanic sustainable development. The panel's most recent report highlighted the Mikoko Pamoja project in Gazi Bay, Kenya – a Global Environment Facility/ UNEP Blue Forests Project site – which is the world's first community-based blue carbon finance project focusing on mangrove restoration (Stuchtey *et al.* 2020).

The Norwegian Government has financially supported various domestic and international blue forests projects over the years. However, these projects have yet to be condensed into a singular strategy. The Norwegian Blue Forests Network seeks to support this discussion by landscape mapping blue forests projects from 2015 to the present.

1.2 Aim and scope of the report

This report aims to provide an estimated overview of the domestic and international blue forests projects financially supported by the Norwegian Government by using landscape maps to present the data visually. Additionally, this report will present key findings from stakeholder interviews conducted in 2020, which identify potential opportunities and perceptions regarding blue forests policy within Norway. Overall, the findings from this report will allow the relevant policymakers in Norway to evaluate current priority areas and consider future policy opportunities for blue forests moving forward.

This report is an initial assessment, serving as a preface to any subsequent in-depth analyses. Therefore, this study focuses on the four types of blue forest considered most pertinent to Norwegian interests: kelp forests, seagrass meadows, mangrove forests and saltwater marshes. Kelp forests and seagrass meadows are the most abundant blue forests in Norway, covering over 8,000 km² (Gundersen *et al.* 2011) and an estimated 93 km² (Gundersen *et al.* 2018) of the Norwegian coastline respectively.

Saltwater marshes – i.e. coastal wetlands flooded and drained by ocean tides – are also found in Norway (Borgersen *et al.* 2020) but are less common. Mangrove forests are only found in tropical and subtropical coastal zones; however, they are prevalent in countries where Norway provides international support for climate and sustainable development efforts.



2. Methods

To gain a baseline of project information and perceptions regarding blue forests in Norway and abroad, a survey instrument was used to guide semi-structured interviews. The survey instrument (see appendix 1) is adapted from a previous study completed by GRID-Arendal and the Abu Dhabi Global Environmental Data Initiative (Lutz 2021). The survey instrument explored five main themes:

1. perceptions of the potential importance of blue forests to marine and climate policies
2. identifying policies that are relevant to blue forests (both domestic policies and international agreements)
3. understanding recent, current, future and ideal blue forests projects
4. perceptions of potential co-benefits and impacts of blue forests
5. recommendations and future opportunities for blue forests policy

Existing project databases were reviewed, including the following resources: the national database (minidata) of the Norwegian Ministry of Foreign Affairs and the Norwegian Agency for Development Cooperation, Innovation Norway, the Research Council of Norway, and the European Union Community Research and Development Information Service. Annual reports and grant letters over the past five years from the Norwegian Environment Agency, the Ministry for Climate and Environment and the Ministry for Trade, Industry and Fisheries were also examined. Annual reports and web pages of relevant research institutions within Norway were consulted. Relevant Norwegian embassies were also contacted.

A group of 10 stakeholders were strategically selected to represent a wide range of interests within the national discussion on blue forests. This group was adjusted due to availability and expanded to include others recommended by the participants, resulting in 11 participants in total. In some cases, agencies were represented by multiple stakeholders.

The identities of individual participants are anonymous; however, they represent the following organizations, agencies and industries:

- the Institute of Marine Research
- the Norwegian Institute for Water Research
- the Norwegian Ministry of Climate and Environment
- the Norwegian Agency for Development Cooperation
- the World Wide Fund for Nature, Norway
- REV Ocean
- Seaweed Energy Solutions
- Agder County (Fylkeskommune)
- Møre og Romsdal County (Fylkeskommune)

Interviews were conducted through the video conferencing application Zoom to properly comply with national safety precautions and prevent the spread of COVID-19. Interviews took place between October and December 2020.

The survey questions employed for this analysis included multiple-choice or five-point Likert scale-style questions and open-ended questions. Interviews were conducted in English and lasted an average of 40 minutes. Consent was requested i) for each interview and ii) to record audio using the Zoom application. Before administering the survey, interviews began with an introduction to the rationale for this report, followed by a definition of blue forests.

Following the interviews, the recorded audio files were transcribed. Due to the open-ended questions and semi-structured nature of the interviews, participants were able to add supplemental information throughout the survey. These qualitative data were then coded for common threads and key findings, which will be presented in the following sections.



3. Interview results

3.1 Demographic overview of interview participants

The majority (63 per cent) of participants are employees of the Norwegian Government, representing both the national and regional levels of governance. Non-governmental organizations accounted for 27 per cent of participants, while members of private industry accounted for 9 per cent of participants. Although familiar with blue forests, the participants represent diverse interest groups and backgrounds ranging from aquaculture to fisheries, macroalgae cultivation, conservation, marine biology, deep-sea ecology and spatial planning.

3.2 Policy and management

This section aimed to identify participant perceptions of the potential importance of blue forests to marine and climate policies. Table 1 displays participant responses to each statement

Figure 1. Employment sectors of survey participants

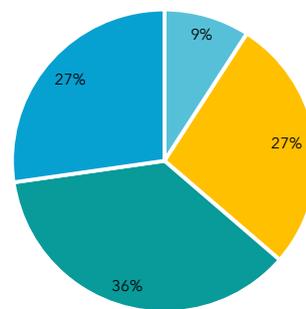


Table 1: Perceived importance of blue forests to marine and climate policies

Policy and management	Strongly agree	Agree	Neutral	Disagree	Don't know
1. Recognition of the value of blue forests can help improve the management of marine ecosystems within Norway.	73%	18%	9%	-	-
2. Recognition of the value of blue forests can help improve the management of marine ecosystems within coastal nations (small island developing states (SIDS), least developed countries (LDCs)).	91%	9%	-	-	-
3. Recognition of the value of blue forests can help improve efforts to address the global climate change challenge within Norway.	37%	27%	27%	9%	-
4. Recognition of the value of blue forests can help improve efforts to address the global climate change challenge within coastal nations (SIDS, LDCs).	37%	36%	18%	-	9%

Note: "Strongly Disagree" was included as a possible response but was not selected by any participants for this question

3.3 Relevant policies

Domestic policies

This section aimed to identify domestic policies relevant to blue forests. After thoroughly reviewing government reports and white papers, specific national policies containing blue forests language were selected. Participant views are identified in the following table.

One participant also noted the potential relevance of blue forests to the National Ocean Resources Law (Havressursloven) regarding the cultivation of wild kelp and seaweed.

Table 2: Views on the relevancy of blue forests to national policies and management strategies

National marine management and climate policies within Norway	Relevance rate (% of participants)
National policy on ocean management (e.g. the Norwegian Government's Ocean Strategy)	82%
National policy on biodiversity (e.g. the National Diversity Act)	73%
The management of Marine Protected Areas within Norway (e.g. the Integrated Management Plan for the Norwegian Sea)	91%
National policy on foreign aid and sustainable development (e.g. Strategy for Foreign Affairs, Norwegian Agency for Development Cooperation)	55%
National policy on the blue economy (e.g. the Norwegian Government's Bioeconomy Strategy, the Norwegian Government's Strategy for Green Competitiveness)	82%
National climate change policies (e.g. Norway's Climate Strategy for 2030)	73%

Note: The term "relevance rate" within this table combines "very relevant" and "relevant responses" from participants.



Additionally, many participants offered supplemental comments to their answers and noted other areas of national policy where they felt blue forests should be relevant. Their comments have been summarized by the following four statements:

- The value of blue forests should be better incorporated into cooperative, integrated regional approaches for resource management along the coastline.
- Restoration policies for blue forest ecosystems should be developed at both the national and municipal levels.
- The value of blue forests should be embedded within the national fisheries policy, as well as within the energy policy (oil and gas, offshore wind) and the tourism policy.
- Municipal and regional governments should champion the protection and conservation of vulnerable coastal ecosystems at the local level.

International treaties and agreements

This section aimed to identify international treaties and agreements relevant to blue forests. Participant views are provided in Table 3.

Participants also noted the potential relevance of blue forests to other international agreements, such as the Ramsar Convention on Wetlands of International Importance, the OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic and the European Union Water Directive, which requires all regions within Norway to report the status of water quality – including biological indicators and nutrient levels within bodies of water.

3.4 Current project areas and landscape mapping

This section aimed to identify the current blue forests policy landscape and understand how the various blue forests categories are prioritized. Participants listed any recent or current blue forests projects of which they had knowledge.

Responses to this question, in conjunction with supplementary research, were used to produce the policy landscape maps and inform estimated project totals.



Figure 2. Participant rankings of blue forests categories

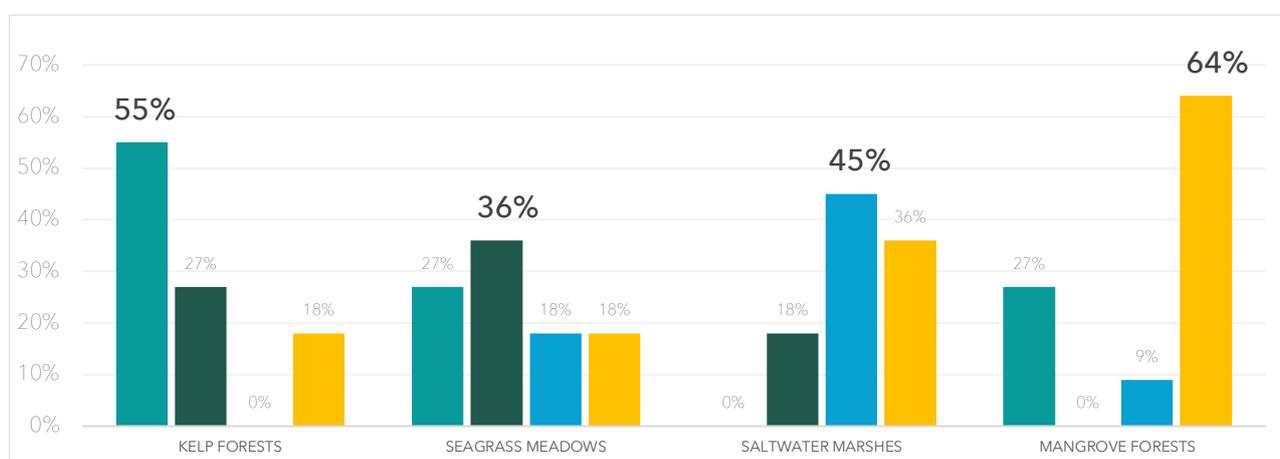


Table 3: Views on the relevancy of blue forests to international treaties and agreements

International agreements	Relevance rate (percentage of participants)
National support for the REDD+ programme in developing nations	55%
Carbon accounting and pledges under the Paris Agreement	64%
Actions to fulfil the Convention on Biological Diversity	82%
Actions to achieve United Nations Sustainable Development Goal 14	91%

Note: The term “relevance rate” within this table combines “very relevant” and “relevant” responses from participants.

Blue forests’ priority areas

Participants were first asked to prioritize the blue forests categories highlighted within this report – kelp forests, seagrass meadows, salt marshes and mangrove forests – in relation to their area of work. Fifty-five per cent of participants ranked kelp forests as their top priority, 36 per cent ranked seagrass meadows second highest, 45 per cent ranked saltwater marshes third highest and 64 per cent ranked mangrove forests as their lowest priority.

Additionally, Figure 2 illustrates the overall breakdown of participant rankings for all blue forests categories. In some cases, participants did not rank all categories due to their lack of relevance to the participant’s area of work. In other cases, participants attributed equal priority to some blue forests categories.

Landscape mapping of blue forests projects

Maps 1 and 2 represent an estimated overview of the blue forests projects supported by the Norwegian Government from 2015 to the present day. The data provided for all landscape mapping are a combination of participant responses from stakeholder interviews and analyses of databases and annual reports, as described in section 2. The following totals are not comprehensive and should be understood as estimates.

Highlighted in blue are the 25 countries that have received an estimated total of 327 million Norwegian kroner (NOK) for various blue forests projects. This map includes domestic projects which, as previously mentioned, can include projects relating to the harvesting and cultivation of kelp. Additionally, Table 4 lists the corresponding data specific to regions and the estimated funding allocated per region.

Map 1. Worldwide Norwegian-supported blue forests projects

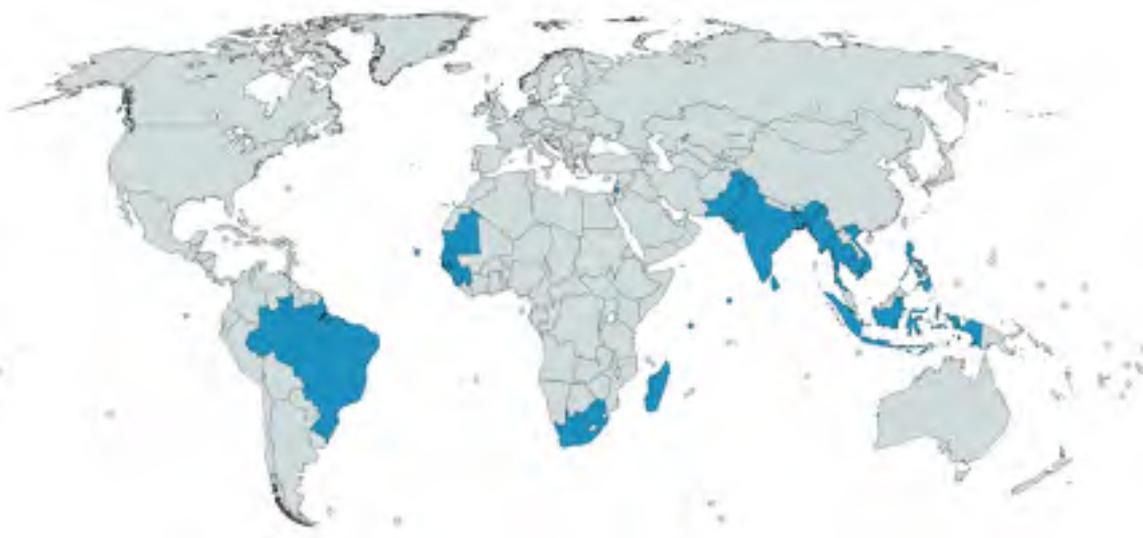


Table 4: Total Norwegian-funded international blue forests projects by region (in Norwegian kroner)

Regions	Estimated total NOK
Africa: Mauritania, Senegal, Gambia, Guinea-Bissau, Guinea, Cabo Verde, Sierra Leone, Madagascar, South Africa	23,495,000
Americas: Haiti, Brazil	6,376,619
Asia: Bangladesh, Cambodia, India, Indonesia, Maldives, Myanmar, Pakistan, Seychelles, Sri Lanka, Thailand, Viet Nam, Philippines	27,699,000
Europe: Norway	264,059,999
Middle East: Palestine	5,500,000
Estimated total	327,166,618

Note: For a more detailed account of project titles, years, coordinating organizations, and funding sources please see the Blue Forests Project Database provided in Appendix 2.

This map illustrates an approximate breakdown of the different categories of international blue forests projects supported by Norway. This map does not include domestic projects. Additionally, Table 5 lists the corresponding data for each blue forests category and the estimated funding totals

per category, as well as the percentage that each category represents. In some instances, projects may involve two or more blue forests categories simultaneously. Projects of this nature are classified in Table 5 as “multiple blue forests”.

Map 2. Categories of blue forests projects supported by the Norwegian Government

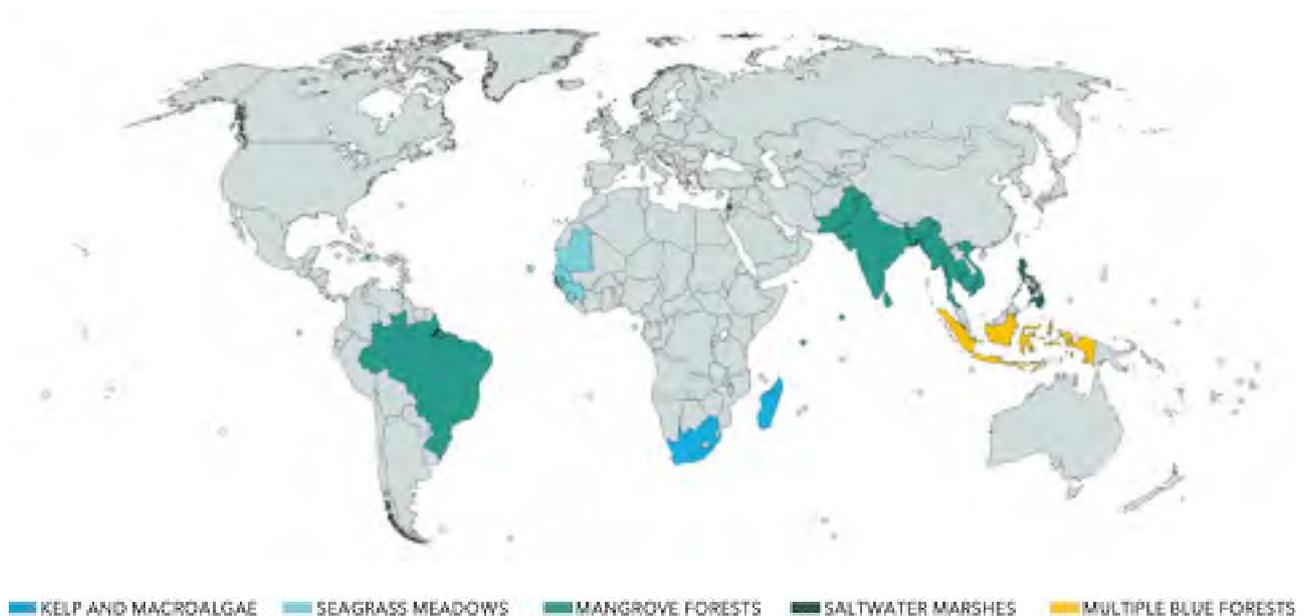


Table 5: Norwegian-funded international blue forests projects listed by category (in Norwegian kroner)

Blue forests categories	Estimated total NOK	Percentage of total
Kelp forests and macroalgae	20,495,000	32.5%
Seagrass meadows	3,000,000	4.8%
Saltwater marshes	6,050,000	9.6%
Mangrove forests	14,525,619	23%
Multiple blue forests	19,000,000	30.1%
Estimated total for international projects	63,070,619	

Domestic blue forests projects supported by the Norwegian Government

Table 6 presents the domestic blue forests projects financially supported by the Norwegian Government, broken down by the estimated total of Norwegian kroner granted and the percentage that this represents per category.

The majority of domestic projects are affiliated with kelp and macroalgae, while multiple blue forests account for approximately 43 per cent of projects. All projects associated with seagrass meadows are included within the multiple blue forests category.

Table 6: Norwegian-funded domestic blue forests projects, listed by category (in Norwegian kroner)

Blue forests categories	Estimated total NOK	Percentage of total
Kelp forests and macroalgae	151,345,999	57%
Saltwater marshes	100,000	0.04%
Mangrove forests	-	-
Multiple blue forests	112,650,000	42.96%
Estimated total for international projects	264,095,999	



Domestic blue forests projects supported by the European Union

Table 7 focuses on the domestic projects that have received outside funding from various European Union programmes and funds. These projects are predominately related to kelp and macroalgae (94 per cent), though some involve kelp and other blue forests categories simultaneously.

These data, though not within the immediate scope of this report, reflect the considerable international interest in selecting Norway as a prime research and development location for kelp and macroalgae projects.

Table 7: European-funded domestic blue forests projects, listed by category (in Norwegian kroner)

Blue forests categories	Estimated total NOK	Percentage of total
Kelp forests and macroalgae	133,327,733	94%
Seagrass meadows	0	0%
Saltwater marshes	0	0%
Mangrove forests	-	-
Multiple blue forests	8,320,199	6%
Estimated total for international projects	141,647,932	



3.5 Co-benefits and impacts

This section aimed to identify potential co-benefits and impacts of blue forests. Table 8 presents participant responses to each statement.

Additionally, participants had the opportunity to comment or list any other co-benefits of blue forest ecosystems not mentioned in the survey. Four themes emerged from participants' comments:

- Communicating the importance of potential co-benefits of blue forests ecosystems to fisheries and acknowledging the value of these co-benefits within the national fisheries policy are necessary next steps.
- The empowerment of local communities and women, particularly in developing nations, is a crucial co-benefit that blue forests can provide.
- Blue forests harbour significant benefits for above-sea species, including seabirds and seals.
- Blue forests can also provide co-benefits for commercial macroalgae cultivation operations.

Table 8: Perceived co-benefits and impacts of blue forests by participants. Response values represented in percentages

Co-benefits and Impacts	Strongly agree	Agree	Neutral	Disagree	Don't know
1. Recognition of the value of blue forests can help increase marine biodiversity within Norway	73%	27%	-	-	-
2. Recognition of the value of blue forests can strengthen coastal climate adaptation strategies within Norway and/or in coastal nations	91%	8%	-	-	-
3. Recognition of the value of blue forests can help purify ocean water within Norway	18%	37%	18%	-	27%
4. Recognition of the value of blue forests can help increase blue economy opportunities within Norway	73%	27%	-	-	-
5. Recognition of the value of blue forests can help increase coastal tourism within Norway	18%	55%	18%	9%	-
6. Recognition of the value of blue forests can help maintain essential habitats for commercially valuable fish, crustaceans and invertebrates within Norway	73%	27%	-	-	-

Note: "Strongly Disagree" was included as a possible response but was not selected by any participants for this question.

3.6 Future blue forests projects

This section aimed to identify potential co-benefits and impacts of blue forests. Table 8 presents the responses to each statement.

This section aimed to identify where future efforts for blue forests should be directed. This entailed participants answering a hypothetical question that aimed to identify ideal blue forests projects that they would like to see completed, as well as listing any future blue forests projects that they or their place of employment have plans to complete.

Ideal blue forests projects

In this hypothetical question, participants were asked if offered unlimited funding, what types of projects would they want to be supported (domestically or internationally) within kelp forests, seagrass meadows, saltwater marshes, and mangrove forest ecosystems? This question yielded many interesting responses, with 10 themes emerging throughout interviews:

More projects should be funded with the goal of developing a coherent, international strategy and framework for governing blue forests globally.

More funding ought to be directed towards the national mapping, measuring and monitoring of blue forests – as well as biodiversity in general – using proper methodological tools.

Norway should take on a leadership role internationally by championing projects regarding the global management and restoration of kelp forests.

Projects involving the restoration of all blue forests, both in Norway and abroad, should be highly prioritized.

The blue forests ecosystems that are most threatened globally should be given higher priority.

Aid for mangrove forest projects should also continue to be prioritized due to their societal impact.

More longitudinal research projects ought to be funded within Norway in order to track how blue forests ecosystems decline over years of incremental development.

More localized research exploring the co-benefits offered to individual regions from blue forests ought to be completed in order to secure these benefits for coastal communities.





More projects that focus on the dissemination of knowledge of blue forests to students, policymakers, fisheries and the general public should be funded.

Blue forests projects with a particular focus on blue carbon should be included within international financial mechanisms such as REDD+.

Future blue forests projects

The overwhelming majority of participants were not aware of any concrete future blue forests projects that have detailed information. This question also included space for participants to identify any potential needs or opportunities necessary to advance potential projects. The two most common themes were:

- More collaborative efforts are needed in order to pursue cross-sector projects moving forward, especially between energy (offshore wind) and macroalgae cultivation.
- Many prospective projects lack the funding necessary to begin. Potential projects related to mapping and international mangrove preservation and restoration efforts were specifically mentioned.

3.7 Additional thoughts on blue forests projects

This section allowed participants to express any additional opinions regarding blue forests not covered by the survey instrument. The opinions most frequently expressed by participants within this section were as follows:

- More research regarding the sustainability of macroalgae cultivation is highly necessary, particularly regarding the topic of ocean ionization.
- It is crucial to incorporate blue forests into sustainable integrated coastal management plans. Plans of this nature often have to balance many competing interests, and the value of natural ecosystems should be appropriately considered within this process.
- As municipal governments often have more capacity to manage coastal ecosystems than counties in Norway, spatial planning efforts to protect vulnerable blue forests ecosystems ought to be executed at the municipal level.
- There is a tendency for blue forests to be only associated with blue carbon, and the term blue forests itself can be confusing for audiences less acquainted with the terminology.
- Financial mechanisms outside of REDD+ may be better suited to supporting widespread, international blue forests projects due to the challenges associated with incorporating blue carbon into REDD+.



4. Discussion

The overall finding of this report is that the Norwegian Government demonstrates positive support for blue forests policy, having granted approximately 327 million Norwegian kroner to blue forests projects in 25 countries around the world since 2015. Domestically, 161 million kroner is estimated to be allocated to kelp forests, 100,000 kroner to saltwater marshes, and 103 million kroner to multiple blue forests. Internationally, 14.5 million kroner is estimated to be spent on mangrove forests, 3 million on seagrass meadows, 6 million on salt marshes, 20.5 million on kelp forests and macroalgae, and 19 million on multiple blue forests. Overwhelmingly, interview participants stated that the Norwegian Government should continue to support projects related to the conservation, restoration and management of blue forests worldwide.

4.1 Interviewee recommendations and future opportunities

At the end of the survey instrument, participants were able to offer insight as to how they believe blue forests policy can be advanced within Norway by suggesting recommendations and identifying potential opportunities (please see executive summary for this list). Additionally, Table 9 presents participant responses to each recommendation statement from the survey instrument:

Table 9: Blue forests recommendations recognized by participants. Response values represented in percentages.

Recommendations	Strongly agree	Agree	Neutral	Disagree	Don't know
1. National recognition of the value of blue forests should be increased	82%	18%	-	-	-
2. International recognition of the value of blue forests should be increased	73%	18%	-	-	9%
3. Scientific research of blue forests should be supported and funded	82%	18%	-	-	-
4. The concept of blue forests should be expanded to include oceanic blue carbon	37%	27%	9%	9%	18%
5. Conservation and restoration of blue forests projects should be supported and funded	64%	36%	-	-	-

Note: "Strongly Disagree" was included as a possible response but was not selected by any participants for this question.

4.2 Key interviewee perceptions

Stakeholder interviews also provided key insight into how participants perceive the current state of blue forests policy in Norway, and the general challenges this policy faces. Listed below are the 10 most common themes that emerged from participants' responses:

- **Blue forests should be adopted** as a distinct category within major policy frameworks, both nationally and internationally. Specifically, there is a need to include blue forests as its own category within Norwegian Marine Protected Areas, the National Diversity Act, the Norwegian Nature Index, the European Union Water Directive, and prospective national policies on the blue economy. At the regional level, blue forests should be explicitly included for conservation metrics within municipal and spatial planning policy. Internationally, there is a need to develop and implement blue forests carbon targets that take into consideration the potential issue of double-counting emissions cutting. The possibility of incorporating blue forests and blue carbon into the REDD+ financial mechanism was also discussed, though this point was disputed by some participants.
- **The science behind the carbon storage potential of kelp and seagrass** is still limited, thus hindering blue carbon policy from being widely implemented. Additionally, robust scientific research should inform policy and commercial activities, and the carbon storage potential of kelp forests should not be overestimated.
- **Other ecosystem services and co-benefits** provided by blue forests beyond carbon sequestration should be more highly valued in policymaking settings.
- **Norway should continue supporting international projects** related to the conservation and sustainable management of blue forests in developing coastal nations, with a strong emphasis on empowering local communities and women.
- **Norway could take on a greater leadership role** to help establish international guidelines for the sustainable management of kelp harvesting, as well as for the preservation, conservation and restoration of kelp forests worldwide.
- **There is a critical need for a nationwide coastal mapping programme** and a standardized methodology to identify vulnerable marine areas as well as to evaluate potential zones for commercial activity and macroalgae cultivation.
- **In Norway, collaboration between different scales of governance** (regional, municipal and national) is critical for efficiently managing and monitoring blue forests ecosystems.
- **The ecological consequences** of large-scale macroalgae cultivation and ocean ionization using macroalgae biomass must be fully examined and researched thoroughly before their widespread adoption.
- The dissemination of blue forests knowledge to the public, coastal communities, decision makers and students and outreach activities for these groups are currently limited.
- Integrated management plans for coastal zones – which incorporate both blue economy opportunities and the preservation of blue forests – must be developed.





4.3 Limitations and drawbacks

This report is an initial assessment, allowing future research opportunities to expand upon its findings. The data collected and used to map blue forests projects could potentially be enhanced and the totals should be understood as estimates. Blue forests projects are often indirectly supported by larger coastal or ecosystem management programmes. In some instances, identifying the precise amount of financial support allocated to specific blue forests was not feasible within the parameters of this report. For projects that encompassed different blue forests categories simultaneously, the term “multiple blue forests” was adopted by this assessment. However, this term is limited in its ability to offer a concise breakdown of how much funding each blue forests category received per project.

Since this report is exploratory in nature, only a limited number of participants (11 in total) were interviewed. All participants had previous knowledge of blue forests and many are involved in discussions regarding blue forests policy in Norway, likely skewing responses to value blue forests at a higher rate. A significant limitation of this assessment is that views and perceptions from the fishing industry were not accounted for (though attempts were made to include fishing industry representatives in the stakeholder interview process).

5. Conclusion

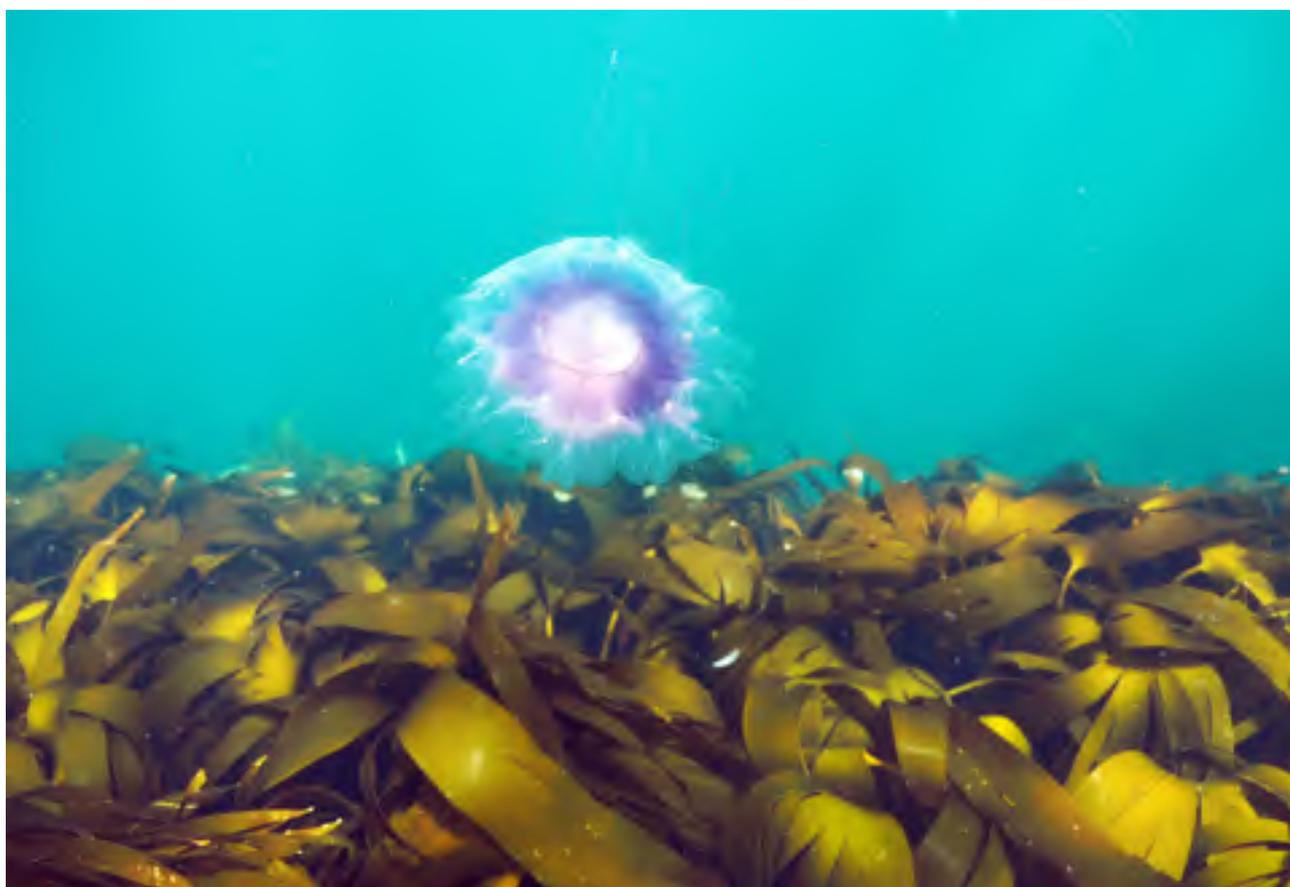
As human-led activities continue to produce exceptional amounts of carbon and to decimate global biodiversity each year, preserving the health of the oceans is critical. In order to do so, natural ecosystems must be comprehensively measured and their value must be commensurate with the myriad of benefits they provide. As carbon-storing coastal ecosystems, blue forests play a considerable role in supporting biodiversity and essential habitats; providing coastal protection from storm surge, flooding and natural disasters; and supplying sustainable resources such as food for humans and animals and alternative materials. Thus, blue forests should be considered a key resource for building global climate resilience.

This report provides a first-level assessment of how the Norwegian Government values blue forests within policies for environmental protection, foreign aid, and economic development. This report looked to projects supported internationally and domestically by the Norwegian Government over the past five years as the primary indicators for assessing blue forests policy engagement. Key stakeholders were interviewed to provide project information and participants offered compelling insight into the state of blue forests policy in Norway.

The key finding of this report is that over the past five years, the Norwegian Government has granted approximately 327 million Norwegian kroner to blue forests projects in 25 countries around the world. Of this, 80.7 per cent was granted to domestic projects and 19.3 per cent to international projects. Kelp forests and macroalgae appear to be the blue forests category prioritized highest by the Norwegian Government, which is consistent with the responses of interview participants.

Indeed, this research has shown that Norway – with its abundant kelp forests, scientific expertise, and growing interest in kelp and macroalgae – may be in a unique position to lead international efforts to develop a framework for the sustainable management of kelp harvesting, as well as for the conservation and restoration of kelp forests worldwide.

Overall, the findings from this report show that while the Norwegian Government supports blue forests projects domestically and internationally, there are still extensive opportunities available to advance coordinated and robust policy and scientific research within the field of blue forests.



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8. Appendices

8.1 Appendix 1: Survey instrument

Survey #:
Date:
Location:
Interviewee:
Interviewer:

Survey Instructions:

1. Introduce yourself and the project. Clearly state the project objectives:

This interview aims to identify the landscape of projects regarding the concept of Blue Forests in Norwegian policy and management, both domestically and internationally. It also identifies perceptions and attitudes on the concept, and potential blue forests opportunities.

The results of this interview will be used to develop a first-level assessment to help government, civil society and other stakeholders improve understanding of and coordination in blue forests activities. This interview will consist of a survey, including open-ended questions. Please feel free to interrupt if you have any questions.

2. Ask consent for interview. Ask for consent to record interview with assurance interview will be confidential and deleted upon publication of report.

Consent given for interview: Yes / No

Consent given for interview to be recorded: Yes / No

3. Read confidentially statement:

All views expressed in this interview are confidential, and the findings of this report will be anonymized and listed by stakeholder group. Participants will remain anonymous unless otherwise requested.

4. Describe Blue Forests:

'Blue forests' ecosystems include – but are not limited to – mangrove forests, seagrass meadows, kelp and saltwater marshes, which are noted for their potential to store and sequester atmospheric carbon, thereby helping to address the global climate challenge. These ecosystems are also vitally important to coastal and island communities around the world through the many important ecosystem services they provide, including biodiversity, essential habitats for marine life, protection against severe weather, and water purification.

5. Implement survey, it should take about 30 to 60 minutes.

6. Thank participant for their time and contribution.

- I. Stakeholder Group - This section identifies the stakeholder group and background of the person being interviewed.

(SG 1) What is your current occupation? Government / Non-Government Organization / Industry / Other: _____

- II. Policy and Management - This section aims to identify views on the potential importance of Blue Forests to marine and climate management and policy.

(5 = strongly agree, 4 agree, 3 neither agree nor disagree, 2 disagree, 1 strongly disagree)

(PM 1) Recognition of the values of Blue Forests can help improve the management of marine ecosystems within Norway

5 / 4 / 3 / 2 / 1 Don't know

(PM 2) Recognition of the values of Blue Forests can help improve the management of marine ecosystems within coastal nations (Small Island States, Least Developed Countries)

5 / 4 / 3 / 2 / 1 Don't know

(PM 3) Recognition of the values of Blue Forests can help improve efforts to address the global climate change challenge within Norway

5 / 4 / 3 / 2 / 1 Don't know

(PM 4) Recognition of the values of Blue Forests can help improve efforts to address the global climate change challenge within coastal nations (SIDS, LDCs)

5 / 4 / 3 / 2 / 1 Don't know

III. Relevant Policies - This section aims to identify policies relevant to Blue Forests.

(5 = very relevant, 4 relevant, 3 neither relevant nor irrelevant, 2 irrelevant, 1 very irrelevant)

(RP 1) How potentially relevant is or should the value of Blue Forests be to the following marine management & climate policies within Norway?

- a. National policy on **ocean management** (e.g., the Norwegian Government's Ocean Strategy)
5 / 4 / 3 / 2 / 1 Don't know
- b. National policy on **biodiversity** (e.g., National Diversity Act)
5 / 4 / 3 / 2 / 1 Don't know
- c. National policy on **biodiversity** (e.g., National Diversity Act)
5 / 4 / 3 / 2 / 1 Don't know
- d. The management of **Marine Protected Areas** (MPAs) within Norway (e.g., the Integrated Management Plan for the Norwegian Sea)
5 / 4 / 3 / 2 / 1 Don't know
- e. National policy on **foreign aid and sustainable development** (e.g., Strategy for Foreign Affairs & Norad)
5 / 4 / 3 / 2 / 1 Don't know
- f. National policy on the **blue economy** (e.g., the Norwegian Government's Bioeconomy Strategy, the Norwegian Government's Strategy for Green Competitiveness)
5 / 4 / 3 / 2 / 1 Don't know
- g. National **climate change** policies (e.g., Norway's Climate Strategy for 2030)
5 / 4 / 3 / 2 / 1 Don't know
- h. Can you think of any other relevant national policies & management?

(RP 2) How potentially relevant is or should the value of Blue Forests be to the following **international agreements**?

- a. National support for the **REDD+ Program** in developing nations (e.g., the Norwegian Climate and Forest Initiative)
5 / 4 / 3 / 2 / 1 Don't know
- b. National **carbon accounting and pledges** under the **Paris Climate Agreement** (e.g., actions in Nationally Determined Contributions (NDCs))
5 / 4 / 3 / 2 / 1 Don't know
- c. Actions to fulfill the **Convention on Biological Diversity** (e.g., 2020 Aichi Biodiversity Targets)
5 / 4 / 3 / 2 / 1 Don't know
- d. Actions to achieve **UN Sustainable Development Goal 14**: To conserve and sustainably use the oceans, seas and marine resources for sustainable development
5 / 4 / 3 / 2 / 1 Don't know
- e. Can you think of any other relevant international agreements or treaties?

IV. Current Project Areas - This section aims to identify how the various elements of Blue Forests are prioritized within marine and climate policies in Norway.

Please rank the following Blue Forest ecosystems from 1 (highest priority area) to 4 (lowest priority area) in relation to your work area.

Please also identify any current or recent relevant projects (recent = within 5 years).

- (CPA 1) Kelp forests _____ Projects: _____
- (CPA 2) Seagrass meadows _____ Projects: _____
- (CPA 3) Saltwater marshes _____ Projects: _____
- (CPA 4) Mangrove forests _____ Projects: _____
- (CPA 5) Other? _____ Projects: _____

V. Co-Benefits and Impacts - This section aims to identify potential co-benefits and impacts from Blue Forests

(5 = strongly agree, 4 agree, 3 neither agree or disagree, 2 disagree, 1 strongly disagree)

(BI 1) Recognition of the value of Blue Forests can help **increase marine biodiversity** within Norway

5 / 4 / 3 / 2 / 1 Don't know

(BI 2) Recognition of the value of Blue Forests can strengthen **coastal climate adaptation strategies** within Norway and coastal nations (e.g., protect against erosion, storm intensity, flooding) 5 / 4 / 3 / 2 / 1 Don't know

(BI 3) Recognition of the value of Blue Forests can help **purify ocean water** within Norway

5 / 4 / 3 / 2 / 1 Don't know

(BI 4) Recognition of the value of Blue Forests can help increase **blue economy opportunities** within Norway (e.g., commercial macroalgae cultivation)

5 / 4 / 3 / 2 / 1 Don't know

(BI 5) Recognition of the value of Blue Forests can help **increase coastal tourism** within Norway

5 / 4 / 3 / 2 / 1 Don't know

(BI 6) Recognition of the value Blue Forests can help **maintain essential habitats** for commercially valuable fish, crustaceans, and invertebrates within Norway

5 / 4 / 3 / 2 / 1 Don't know

(BI 7) Other potential co-benefit? _____

VI. Recommendations - This section aims to identify a few recommendations for Blue Forests policy

(5 = strongly agree, 4 agree, 3 neither agree or disagree, 2 disagree, 1 strongly disagree)

(R 1) **National recognition** of the value of Blue Forests should be increased

5 / 4 / 3 / 2 / 1 Don't know

(R 2) **International recognition** of the value of Blue Forests should be increased

5 / 4 / 3 / 2 / 1 Don't know

(R 3) **Scientific research** of Blue Forests should be supported and funded

5 / 4 / 3 / 2 / 1 Don't know

(R 4) The concept of Blue Forests should be expanded to include **oceanic blue carbon** (e.g., the potential climate mitigation role of marine vertebrates)

5 / 4 / 3 / 2 / 1 Don't know

(R 5) **Conservation and restoration** of Blue Forests projects should be supported and funded

5 / 4 / 3 / 2 / 1 Don't know

(R 6) Other potential recommendations? _____

VII. Future Blue Forests - This section aims to identify where future efforts in Blue Forests should be placed

Q 1) If Norway hypothetically received unlimited funds to spend on Blue Forests projects– nationally or internationally– how would you allocate this money within the four different Blue Forests ecosystems (kelp forests, seagrass meadows, saltwater marshes, mangrove forests)? No numeric value here, we are just wondering what are the ideal projects you would want Norway to support regarding these ecosystems if funding wasn't an issue?

Please identify any potential needs or opportunities, or areas for Norwegian funding of future projects:

(FPA 1) Kelp forests	Projects: _____
(FPA 2) Seagrass meadows	Projects: _____
(FPA 3) Saltwater marshes	Projects: _____
(FPA 4) Mangrove forests	Projects: _____
(FPA 5) Other?	Projects: _____

Q 2) Can you think of any other opportunities for advancing Blue Forests related projects?

Q 3) Do you have any other thoughts or views on Blue Forests you would like to share?

Q 4) Would it be okay if we contacted you with additional questions? Yes / No

- Thank you -

8.2 Appendix 2: Blue forests project database

Worldwide Norwegian supported blue forests projects

PROJECT	LEADING ORG/ INST.	YEARS	NATIONAL/ INTL	BF ELEMENT(S)	TOTAL FUNDING (NOK)	FUNDING SOURCE
Mapping of Algae and Seagrass using Spectral Imaging and Machine Learning	UiT, Bodø & Nord Universitet	2020	NATIONAL	Multiple blue forests (Kelp, seagrass)	8000000	Forskningsrådet
ALTPRO	NIBIO	2014-2019	NATIONAL	Multiple blue forests (Kelp, seagrass)	8000000	Forskningsrådet
SeaBee	NIVA	2020-2029	NATIONAL	Multiple blue forests (Mapping of kelp, seagrass)	60000000	Forskningsrådet
Indeksrevidering	NIVA	2016-2017	NATIONAL	Multiple blue forests (Kelp, seagrass)	920000	NEA (Nordic Network for Aviation)
Blått Karbon (Blue Carbon)	NIVA	2017-2019	NATIONAL	Multiple blue forests	3200000	NEA (Nordic Network for Aviation)
CoastalServices	NIVA	2016	NATIONAL	Multiple blue forests	500000	NCM (Nordic Council of Ministers)
OSPAR Common Procedure National Report	NIVA	2016	NATIONAL	Multiple blue forests	350000	Miljødirektoratet
Marine Values (Inner Oslo Fjord)	NIVA	2015-2016	NATIONAL	Multiple blue forests	460000	Natural and Cultural Company Bygdøy
Macroalgae Indexes	NIVA	2015	NATIONAL	Multiple blue forests (Kelp, seagrass)	250000	NEA (Nordic Network for Aviation)
MARTINI	MET & NIVA	2018-2021	NATIONAL	Multiple blue forests	8200000	Forskningsrådet
BlueTrans: Ocean Health Under Blue Transitions	NINA (lead), NIVA, IMR, SALT, NOFIMA, UiT	2018-2021	NATIONAL	Multiple blue forests	11570000	Forskningsrådet
Red List Validation	Nature in Norway	2017-2018	NATIONAL	Multiple blue forests	1200000	Norwegian Biodiversity Information Center
Indonesia's Forest Reference Emission Level (FREL)	CIFOR	2019-2021	INTL - (Indonesia)	Multiple blue forests	19000000	KLD

PROJECT	LEADING ORG/ INST.	YEARS	NATIONAL/ INTL	BF ELEMENT(S)	TOTAL FUNDING (NOK)	FUNDING SOURCE
An Aquaculture Industry for Madagascar	NORAD, Norges Vel, Blue Ventures	2010-2019	INTL - Africa (Madagascar)	Kelp (macroalgae)	16400000	90% Norad support, 10% Norges Vel
BlueConnect	IMR	2018-2023	INTL - Africa (South Africa)	Kelp	40950000	Forskningsrådet
PROMAC	Moreforskning	2017-2020	NATIONAL	Kelp	35000000	Forskningsrådet
Seaweed Cultivation Vessel 2020	SINTEF	2017-2019	NATIONAL	Kelp	8700000	Forskningsrådet
Marine Algae for Better Heart Health	MarVitaAS	2017-2020	NATIONAL	Kelp	400000	Forskningsrådet
Breed4Kelp2Feed	NMBU	2018-2022	NATIONAL	Kelp	8000000	Forskningsrådet
EnMac	Nord Universitet	2019-present	NATIONAL	Kelp	3200000	Regionale Forskningsfond Nord-Norge
MACROSEA	SINTEF	2016-2019	NATIONAL	Kelp	27308750	Forskningsrådet
ProSeaFood	SINTEF (lead)	2018-2021	NATIONAL	Kelp	12387249	Forskningsrådet
SusFood2	Nofima	2018-2021	NATIONAL	Kelp	2400000	Forskningsrådet
Ocean to Oven	IMR	2019-2024	NATIONAL	Kelp	27500000	Forskningsrådet and Norwegian Ministry of Trade, Industry and Fisheries
Kelpro	NIVA	2017-2019	NATIONAL	Kelp	8500000	Forskningsrådet
OptimaKelp	NIVA	2018-2022	NATIONAL	Kelp	7200000	Forskningsrådet
DenGrense	NIVA	2016	NATIONAL	Kelp	250000	NIVA
COASTAL MARINE HABITATS ON SVALBARD	NIVA	2015-2016	NATIONAL	Kelp	450000	Svalbards Mijøvernfond
TallknusPublis	NIVA	2015	NATIONAL	Kelp	250000	NEA (Nordic Network for Aviation)
ALEALGE	Nordland Research Institute	2017-2018	NATIONAL	Kelp	300000	Regionale Forskningsfond Nordland
KELPEX	NBFN	2016-2018	NATIONAL	Kelp	9500000	Forskningsrådet
NBFN Projects (SUKER, KelpFloat, BURSE, SEAME)	NBFN	2017-2019	NATIONAL	Kelp, Seagrass	10000000	

Worldwide Norwegian supported blue forests projects continued

PROJECT	LEADING ORG/ INST.	YEARS	NATIONAL/ INTL	BF ELEMENT(S)	TOTAL FUNDING (NOK)	FUNDING SOURCE
ResilienSea	GRID-Arendal	2018-2022	INTL - Africa (Mauritania, Senegal, The Gambia, Guinea Bissau, Guinea, Cape Verde and Sierra Leone)	Seagrass	3000000	NORAD co- finance portion of project
Saltmarsh Norge	NIVA	2020	NATIONAL	Salt Marsh	100000	Miljødirektoratet
Protecting Natural Resources & Safeguarding the Environment	Norwegian Ministry of Foreign Affairs	2017 & 2019	INTL - Middle East (Palestine)	Salt Marsh/ Coastal wetland	5500000	Norwegian Ministry of Foreign Affairs
Mobilizing Stakeholders for a Support System for Coastal Wetlands	Norwegian Ministry of Foreign Affairs & ASEAN Centre for Biodiversity	2019	INTL - ASEAN (Philippines)	Salt Marsh/ Coastal wetland	550000	Norwegian Ministry of Foreign Affairs
Strengthening the Social Governance of the Amazon Mangrove	Norwegian Ministry of Foreign Affairs & FUNBIO	2018-2019	INTL - South American (Brazil)	Mangroves	498000	Norwegian Ministry of Foreign Affairs
Mangroves for the Future	Norwegian Ministry of Foreign Affairs & IUCN	2015	INTL - Asia (Bangladesh, Cambodia, India, Indonesia, Maldives, Myanmar, Pakistan, Seychelles, Sri Lanka, Thailand and Vietnam)	Mangroves	4000000	Norwegian Ministry of Foreign Affairs
Including Mangroves in REDD+ Asia	NORAD, IUCN	2017-2019	INTL - Asia (Myanmar, Indonesia and Vietnam)	Mangroves	4149000	NORAD
Gouvernance Sud	UNEP and the Norwegian Ministry of Foreign Affairs	2013-2015	INTL - Haiti	Mangroves	5878619	Norwegian Ministry of Foreign Affairs
SPENDING ON BLUE FORESTS PROJECTS (NOK):	NATL KELP:	NATL SALT MARSH:	NATL SEAGRASS:	NATL MANGROVES:	NATL MULT. BLUE FORESTS:	SUM (NATIONAL):
327166618	161345999	100000		0	102650000	264095999
	INTL KELP:	INTL SALTMARSH:	INTL SEAGRASS:	INTL MANGROVES:	INTL MULT. BLUE FORESTS:	SUM (INTERNA- TIONAL):
	20495000	6050000	3000000	14525619	19000000	63070619

Domestic blue forests projects supported by the European Union

PROJECT	LEADING ORG/ INST.	YEARS	NATIONAL/ INTL	BF ELEMENT(S)	TOTAL FUNDING (NOK)	FUNDING SOURCE
GAIN	Forskningsstasjon, Wiaster AS, Salten	2018-2021	NATIONAL	Kelp	9903518	EU H2020
MacroCascade	Hortimare	2016-2020	NATIONAL	Kelp	3027881	EU H2020
NorKHelp	Havforkingsinstu- itutet	2019-2020	NATIONAL	Kelp	2208281	EU H2020
PlastiSea	SINTEF	2020-2023	NATIONAL	Kelp/macroalgae	15884517	ERA Blue Bio Co-Fund (EU)
SNAP	SINTEF	2020-2023	NATIONAL	Kelp	17155357	ERA Blue Bio Co-Fund (EU)
GENIALG	SINTEF, Seaweed Energy Solutions	2017-2020	NATIONAL	Kelp/macroalgae	16385861	EU H2020
Mar3Bio	SINTEF	2016-2018	NATIONAL	Kelp	2384503	EU H2020
AquaVitae	Nofima (Bellona, NORCE, UiT)	2019-2023	NATIONAL	Kelp	22679480	EU H2020
TransAgae	NIBIO	2016-2019	NATIONAL	Kelp/macroalgae	4760887	EU Botnia- Atlantica Fund
SureMETs	UiT	2019-2021	NATIONAL	Kelp/macroalgae	17497448	ERA Blue Bio Co-Fund (EU)
MERCES	NIVA	2016-2020	NATIONAL	Multiple blue forests (kelp, seagrass)	5382507	EU H2020
NEGEM	NIVA	2020-2024	NATIONAL	Multiple blue forests	2847692	EU H2020
CIIMAR Drone	NIVA	2020-2021	NATIONAL	Multiple blue forests (mapping)	90000	EEA
TOTAL INTL. SPENDING ON BLUE FORESTS PROJECTS IN NORWAY (NOK):		KELP:	SALTMARSHES:	SEAGRASS:	MANGROVES:	MULTIPLE BLUE FORESTS:
141647932		133327733	0	0	0	8320199



Norwegian
Blue Forests
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