Greenhouse Gas Observation & Climate-Smart Agriculture

GEOMAR

INDP

TROPOS
Leibniz Institute for Tropospheric Research

Report on feasibility and synergy potential of the "three-spheres-approach"

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Outline

Executive Summary

Deliverable 6.3 reports about the feasibility and synergy potential of the “three-spheres-approach” that was applied in Cabo Verde within the framework of the EU H2020 project SEACRIFOG. The concept synergistically connects the local research agenda of an African country with global research programmes and regional capacity development efforts in a sustainable way. Conducted activities such as various stakeholder dialogue events, high-level science-policy meetings, and scientific workshops are briefly described with respect to their role in the “three-spheres-approach”. The report also provides a conclusion on the outcome of the various activities and their combined synergy potential and gives some recommendations for future actions based on the experiences made during the SEACRIFOG WP6 work.

1 Introduction

The overall task of WP6 is to explore the possibility to synergistically overlap three relevant "spheres" in marine and atmospheric research in Cabo Verde and West Africa (i.e., the national, regional, and global research and capacity development sphere) and to formulate a strategy for its implementation as a demonstration case.

Objectives:

- Explore the possibility to synergistically overlap the following three relevant "spheres" in marine and atmospheric research in Cabo Verde and West Africa (Fig. 1):
    - **Global/International Research Sphere**: State-of-the-art marine and atmospheric research according to highest international standards exposing and connecting the "National Research Sphere" to the international community and science.
    - **National Research Sphere**: Support the national research capabilities to enhance marine and atmospheric research on local/regional topics of high socioeconomic relevance. Assure high scientific standards through support and knowledge exchange with the "International Research Sphere"
    - **Regional Marine Human Capital & Capacity Development Sphere**: Support the development of a West African human capital and capacity in the Mindelo hub. Embed education and training into the context of active national and international research activities (TTR – Training-Through-Research).
- Contribute to "Aim 3" of SEACRIFOG by assessing the possibility of implementing this "three-spheres-approach" in a sustainable way and estimating the synergy potential to all parties involved.

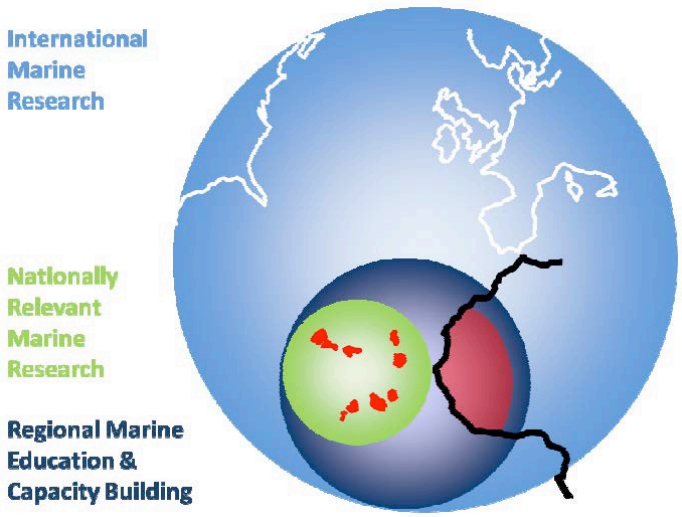

Figure 1 – Three-spheres-approach to identify synergistic overlaps between national and international research activities and regional development and capacity building.

This document first (section 2) provides background information about the state of marine research in Cabo Verde and the existing partnership between Germany and Cabo Verde. Section 3 reports about main activities that were carried out within the framework of SEACRIFOG and about activities and events that are relevant for or associated with SEACRIFOG WP6. In section 4 the synergy potential of these activities (representing all three spheres) will be elaborated and the added value of this three-spheres approach will be discussed.

2 Starting conditions – bilateral partnership

The German and Cabo Verdean partners have a proven record of long-standing cooperation for almost 15 years. Over the years, both sides were involved in several EU research projects.

The cornerstone was a scoping workshop funded by the Volkswagen-Stiftung in 2004 during which the scientific need for sustained marine and atmospheric observations in the West African region was formulated. To adequately address these needs, modern marine and atmospheric researchers needed reliable partners and infrastructure in the region. The conditions for this were found to be ideal in the Republic of Cabo Verde, a politically and socially remarkably stable country that has high ambitions particularly in the field of education as well as its marine affairs. The nation is developing quickly and has made all its marine aspects a central policy focus. In marine research and university education the country needs and seeks international partners. The German-Cabo Verdean cooperation in marine sciences, which was initiated during the 2004 workshop and formalized by a contract between INDP and GEOMAR, forms a sustainable and solid basis for long-term ocean observation and facilitation of field research in the region and to create opportunities for capacity building and education in West Africa. As one of the most significant outcomes of this, the construction of the OSCM started in 2015. In Nov. 2017, the OSCM – featuring laboratories, workshops, large maintenance hall, meeting rooms, guest researcher offices, storage space and many other scientific facilities – was put into operation. The OSCM is a modern and multi-purpose hub for international marine research and education, serving both international and local purposes. Thus, the OSCM plays a major role in the implementation of the Three-Spheres-Approach.

3 Activities & Events

3.1 SEACRIFOG stakeholder dialogue in Cabo Verde

For task 6.1, a six-month research stay in Cabo Verde was carried out by a researcher from GEOMAR (Dr. Björn Fiedler, Sept. 2017 – Mar. 2018). Local stakeholders were identified and asked for their contribution to the SEACRIFOG project by participating in a dialogue among work package members, stakeholders, and decisionmakers. This dialogue has been fostered by three means: a contribution to a national summer school at a Cabo Verdean university, an exhibition about multidisciplinary marine research with both global and regional relevance and a dedicated “World Café” workshop. The Ocean Science Centre Mindelo (OSCM) was chosen as venue for the two latter activities, whereas the summer school took place at the Praia Campus of Universidade de Cabo Verde (UniCV).

While the exhibition was organized over the course of the research stay, the World Café workshop took place in February 2018 and a total of 28 stakeholders (Africa/Cabo Verde: 16, Africa/other: 5, Europe: 7) participated. Participants covered most of the relevant sectors (science, education, private, authorities, policy, NGO) except tourism.

This workshop followed the concept of a "World Café" dialogue that brought together stakeholders with different background and expertise. The objective was to discuss societal needs and challenges against the background of a global climate change and how environmental research both at the international and the regional level can address these topics adequately.

The World Café is a structured conversational process intended to facilitate discussion, initially in small groups and then linking ideas within a larger group to access the collective intelligence or collective wisdom in the room.

The topics covered during the dialogue were: **Regional Matters**, **International Matters** and **Capacity Building** in the field of environmental sciences in West Africa. Each theme was discussed at a different table (Fig. 2). For 25 minutes, the participants per groups were able to express their opinions and present ideas and suggestions on the proposed topics. After that time the groups moved on to the next table.

Each dialogue table was attended by a facilitator and a notes taker.

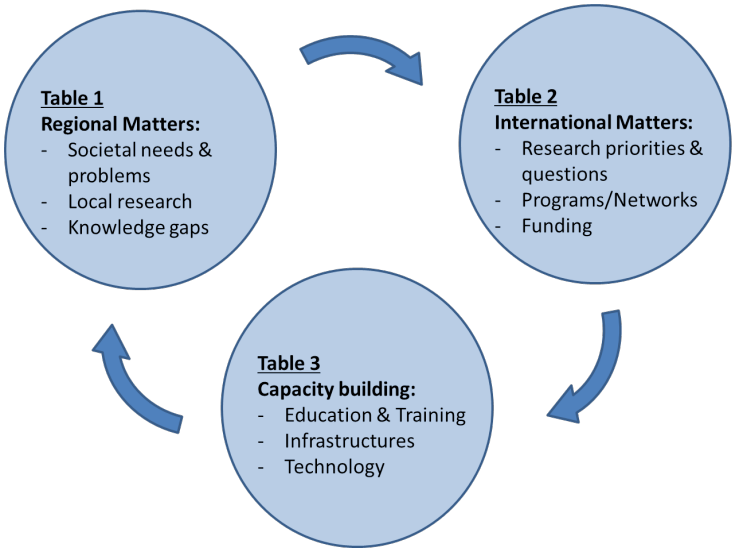

***Figure 2**- Figure schematic of the 3 tables dialogue and their respective themes and key issues.*

Participants found out, that across the Macaronesian archipelagos many similar challenges exist with regard to environmental research. Although some institutions in Cabo Verde are very engaged in regional research projects, a demand for better connection between local and international research initiatives was formulated. This has to go along with systematically developing capacities. Cabo Verde appeared to have a very high demand for this when compared to the other regions.

Outcome: SEACRIFOG deliverable report D6.1.; joint development of a research proposal that applies the Three-Spheres-Approach (see section 4).

3.2 Three-Spheres-Workshop in Cabo Verde

In order to maximize the success of the SEACRIFOG workshop, it was embedded into the "International Workshop on Marine and Atmospheric Sciences in West Africa" which was held in November 2017 at the OSCM in Cabo Verde. Both workshops benefitted from each other due to largely increased attention, enhanced visibility and relevance, as well as more efficient logistics. The workshop was attended by 163 participants representing 25 nations (13 African, 8 European, and 4 North- and South American countries).

Two other international projects were present who had previously gained significant experience in multilateral cooperation in West Africa, thereby providing valuable input to the workshop: The EU FP7 project PREFACE (Enhancing prediction of tropical Atlantic climate and its impacts) as well as the trilateral German-French-Africa research project AWA (Ecosystem approach to the management of fisheries and the marine environment in West African waters).

The three components of the "Three-Spheres Concept" were covered in separate sessions and in each session local stakeholders and international participants were present. The sessions helped the wide spectrum of local and regional stakeholders to better understand the international scope of ongoing research efforts in Cabo Verde. Vice versa, international participants were exposed to local and regional research questions and priorities. This combination allowed to explore potential connections between local research needs and international research agendas (for further details refer to D6.2 deliverable report).

Outcome: SEACRIFOG deliverable report D6.2.; co-design of the WASCAL master programme curriculum.

Figure 3 – Group photo of workshop participants of the International workshop on Marine and Atmospheric Sciences in West Africa.

3.3 Monaco Explorations stakeholder dialogue

On the occasion of the execution of a joint field work campaign in Cabo Verde with the "Monaco Explorations" programme, a high-level stakeholder dialogue event was organized at the OSCM (SEACRIFOG WP6 co-organized this event). About 100 international and national stakeholders and policymaker followed the invitation. His Serene Highness, Prince Albert II of Monaco, participated in this event which allowed a dialogue on a high political level.

Several relevant stakeholders were identified during this event and contacts established which finally got involved in SEACRIFOG WP6 work. Furthermore, the political relationship between both countries has been intensified after this event and future collaborations in the field of blue economy development and marine sciences are being developed currently.

Outcome: A first map of local stakeholders and policymakers was created and formed the basis for subsequent WP6 activities.

Figure 4 – H.S.H. Prince Albert II of Monaco during the high-level stakeholder dialogue event at OSCM in Sept. 2017.

3.4 POGO annual meeting

The Partnership for Observation of the Global Ocean, POGO, is a forum created in 1999 by directors and leaders of major oceanographic institutions around the world to promote global oceanography. Of particular focus is the implementation of an international and integrated global ocean observing system. POGO is a partnership of institutions involved in oceanographic observations, scientific research, operational services, education, and training. POGO does not set scientific goals, but focuses attention on implementation issues such as technical compatibility among observing networks, shared use of infrastructure, and on public outreach and capacity building.

POGO's Mission is to:

1. Lead innovation and development of the crucial components of the ocean observing system.
2. Identify and contribute to the development of the key skills, capabilities and capacities needed to achieve the vision.
3. Work with Governments, Foundations and Industry, to articulate the benefits to society and required funding to build and sustain the system.

The 20th POGO Annual Meeting (POGO-20) was held from 22-23 January 2019, hosted by the Instituto Nacional de Desenvolvimento das Pescas (INDP) and the GEOMAR Helmholtz Centre for Ocean Research Kiel, at the Ocean Science Centre Mindelo (OSCM) on the island of São Vicente, Cabo Verde.

The Meeting was extremely well attended, bringing together 86 delegates from 25 countries. The location was strategically chosen in line with POGO's current focus on bringing in African countries to contribute to the global ocean observing agenda and to become members of POGO. Thus, representatives of institutions and universities in Benin, Côte d'Ivoire, Ghana, Nigeria, Senegal, and Tunisia were present and provided valuable insights to the needs and priorities of northern and western African countries.

Topical sessions focused on "Sustained observing in the South Atlantic Ocean and beyond", "Ocean observing technology and sensor development", and a lunch Side Event on Capacity Development. Discussions during the latter session included aspects of the Three-Spheres-Approach and provided further input to this deliverable.

Outcome: POGO Cabo Verde Declaration on Ocean Observations (see annex I); INDP became a new member of POGO (currently the only African member institution).

Figure 5 - POGO-20 delegates outside the OSCM in Mindelo, Cabo Verde. Photo Credit: Andreas Villwock, GEOMAR.

3.5 EU High-Level Science-Policy Exchange

On 21-22 November 2018, the European Commission in partnership with GEOMAR (Germany) and the National Institute for Fisheries Development (INDP, Cabo Verde) organized a high-level event "Our Atlantic Ocean for Growth and Well-Being" at the Ocean Science Centre Mindelo OSCM, Cabo Verde.

The highlight of the event was the signing of the *Cooperation Arrangement* between the European Commission and the Government of the Republic of Cabo Verde on Marine Research and Innovation Cooperation, on 22 November 2018.

This newly signed arrangement will constitute a new framework for cooperation and an important step for involving Cabo Verde in the ongoing work related to creating opportunities for an All Atlantic Ocean Community, as part of the implementation work of the *Belém Statement*[*)].

The event also included a Round Table Discussion on Innovation in the Blue Economy and the Prime Minister´s Speakers Series, where Commissioner Moedas, together with Cabo Verde Prime Minister Ulisses, spoke to the audience about entrepreneurship, innovation and the challenges of technology in modern days, prompting a great interest for further interaction with European startup and incubators initiatives.

November 21st was dedicated to the topic "Marine Science meets Policy: Project, Initiatives and Ideas Meeting Place", and interlinked stakeholders from Cabo Verde, Europe, and West Africa. Over 30 experts shared their insights in seven thematic sessions, which reflected well the key cooperation areas identified by Cabo Verde and the European Commission.

WP6 members were involved in developing the agenda, participated in this event and presented examples from all three spheres of the Three-Spheres-Approach. The concept has been discussed in panel discussions with international participants from science and science-policy.

Outcome: Cooperation Arrangement between the European Commission and the Government of the Republic of Cabo Verde on Marine Research and Innovation Cooperation (see annex II).

3.6 TROPOS summerschool

To improve on the awareness and build capacity towards the understanding of atmospheric and marine sciences in Cabo Verde, a marine and atmospheric science summer school was organised at the University of Cabo Verde (UniCV) in Praia the capital of Cabo Verde from the 16th to 18th of October 2017. The school lasted for three days with 46 local participants including 30 undergraduate and six postgraduate students and ten University lecturers as well as 14 international participants from France, UK, China and Germany including students and renowned professors in the fields of atmospheric and marine sciences. The local stakeholders were the UniCV and the national institute of meteorology and geophysics (INMG). The summer school focused on the fundamentals of atmospheric sciences, measurement techniques and quantification of aerosol constituents, understanding aerosol impacts on the environment relating to air quality, climate and ocean atmosphere interaction, marine sciences perspective in Cabo Verde, and last but not least, understanding climate change and trends of greenhouse gases in the Cabo Verde region. The lectures were offered by both local and international experts in the respective fields.

The summer school provided the opportunity for students to interact with experts in the fields of marine and atmospheric sciences and learn about the necessity to protect their environment and further understand the role of the ocean in controlling atmospheric processes. On the other hand, it encouraged the students to develop career perspectives in atmospheric and marine sciences. At the end of the lectures, the participants had the opportunity to visit the mobile air quality laboratory of the INMG to familiarise themselves with the measurement techniques they learned about during the lectures. At the facility, participants were exposed to new and old methods used in quantifying meteorological events and air quality parameters in Cabo Verde.

*) https://ec.europa.eu/research/iscp/pdf/belem_statement_2017_en.pdf

Figure 6 - Summer school activities at the INMG air quality mobile laboratory facility. Photo: K. Wadinga Fomba, TROPOS

Finally, through the collaborative mood between the local and international participants, a network was created through which local capacity could be enhanced and strengthen through exchange of lecturers between participating institutions within local and EU initiatives such as the Horizon 2020 RISE MARSU project.

Outcome: Certificates of participation were issued and joint research exchange proposal between UniCV and TROPOS was developed for the TWAS collaboration program.

4 Conclusion of the Three-Spheres-Concept demonstration case for Cabo Verde

The various activities described in section 3 provided us with a detailed in-depth picture of both the current academic education as well as the necessities, obstacles and ambitions in a developing state in Africa. SEACRIFOG WP6 either organised or co-organised these activities or was directly involved in the development of the agendas. Thereby, WP6 ensured that all three spheres were represented during these activities and that interactions and exchange between those were fostered. Further, representatives not only from science but also from policy, the private and public sectors where invited to enhance the dialogue.

The manifold outcomes can be summarized as follows:

- Without professional and dedicated coordination, the activities under the three spheres have a great risk to be carried out in separation, i.e. without adequate communication, coordination and co-design. In other words, international research projects could happen to be executed without active involvement and participation of local scientists thereby missing great opportunities for capacity development. Likewise, local research and education needs may remain unheard and unaddressed without an adequate forum to meet, thereby missing great potential for co-design of science questions and projects.

- Regardless to which of the three spheres they belong, individual researchers and academicians have a tendency to focus on their immediate projects where they feel secure and have control. Interaction across spheres, i.e. between communities and across educational, cultural and even language boundaries, often does not come naturally and therefore needs to be actively encouraged.

- Synergistic combination of the three spheres has the potential to mutually augment research and education agendas. Co-design of research questions, approaches and projects have the potential to yield better and more significant results.

- A joint research proposal was developed by different actors (scientists and private sector) who participated in various activities described in section 3. The proposal (CEM_CV: Coastal Ecosystem Monitoring in Cabo Verde) got selected for funding recently and will be implemented over the next two years. The project follows the Three-Spheres concept in order to augment the project's impact in Cabo Verde.

- Fostering three-spheres-interaction requires a dedicated platform and professional moderation. Meeting, discussion and exchange formats need to be developed and offered on a regular basis. Particularly smaller and less formal formats with smaller groups and casual settings lower hesitations and foster interaction among participants.

- Based on our experiences, we propose the development of a "Local Ocean Solutions Hub" – a communication and interaction platform that allows scientists and lecturer to meet with local stakeholders. This hub is meant to identify local/regional concerns and research needs and facilitate the joint development of small-scale projects to address those problems and provide ideas for solutions. We are convinced though, that such a hub can only be successful when local coordination is established which interacts regularly with a defined group of contact persons in all three spheres.

Annex I: Cabo Verde Declaration on Ocean Observations (POGO)

Partnership for Observation of the Global Ocean

Cabo Verde Declaration on Ocean Observations

A Statement by the Partnership for Observation of the Global Ocean (POGO), issued at its 20th Annual Meeting held in Mindelo, Cabo Verde, in January 2019.

Signed by the directors of POGO member institutions:

Call to Action

We call on all governments, as well as funders and stakeholders worldwide, to support ocean science institutions in Africa, Small Island Developing States, and other parts of the developing world to participate fully in global endeavours to measure and understand changes in their regional and local marine environments. Specifically, to establish and maintain observing systems, data sharing capacities and information development to advance science and inform ocean-related decision making in the context of the blue economy, environmental protection, improved ocean governance and sustainable development.

The Importance of Observing the Ocean

Despite its growing importance and pervasive impact, too little is known about the ocean. The Census of Marine Life[1] estimated that at least three species remain to be discovered for each already known. The First World Ocean Assessment (WOA) of 2016[2] points to the many gaps in our scientific understanding of the ocean, including sea-level rise, ocean acidification, nutrient distribution and cycling, primary production, biodiversity, population health and reproductive success, fish stocks, and threatened and declining species and habitats.

In recent years, the world has increasingly recognised the critical role that the ocean plays in the Earth's life-support system, as well as its importance for our societies and economies. The importance of the ocean has been emphasised at the highest political levels, as a critical dimension of the UN 2030 Agenda for Sustainable Development, as evidenced by the establishment of Sustainable Development Goal 14 "Life Below Water", the ongoing process for a second Assessment of the State of the Ocean (see also a recent statement by POGO)[3] and the recently established UN Decade of Ocean Science for Sustainable Development.

Nevertheless, the expected growth towards the full deployment of the Global Ocean Observing System (GOOS) has slowed down in the last decade, for the following reasons:

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[1] Census of Marine Life Highlights Report, 2010. http://www.coml.org/highlights-2010 (accessed 4th Feb 2019).

[2] The First Global Integrated Marine Assessment, World Ocean Assessment I, by the Group of Experts of the Regular Process. http://www.un.org/Depts/los/global_reporting/WOA_RegProcess.htm (accessed 4th Feb 2019), and Cambridge University Press, 2017 (ISBN-13: 978-1316510018).

[3] The Value of the Global Ocean Observing System and the Regular Assessment of the State of the Ocean in Support of Wise Decision-Making. POGO, September 2018. http://ocean-partners.org/sites/ocean-partners.org/files/public/attachments/POGO_statement_value_of_GOOS_WOA_final.pdf (accessed 12th March 2019).

1. the capacity for conducting ocean observations is lacking in many parts of the world, particularly in developing countries;
2. several critical sustained ocean observation activities are supported by short-term, research project funding with uncertain sustainability;
3. although technological developments are taking place for biological and biogeochemical observations, their high cost makes these technologies inaccessible to developing countries and currently prohibits their routine and large-scale deployment; and
4. the resources available for international coordination are currently insufficient for the scale of the work that is required.

Why prioritise ocean observations in developing countries?

The societies and economies of many developing countries rely heavily on the ocean, for example through coastal tourism, trade infrastructure, natural resource extraction, and small-scale and industrial fisheries and aquaculture. However, extreme weather events, sea-level rise, tsunamis, harmful algal blooms and water pollution threaten the world's poorest and most vulnerable coastal and island communities. Ocean observations and information services can be used to improve human health and safety and food security, support livelihoods and small-scale economic activities (artisanal fisheries and aquaculture, coastal tourism), and improve climate resilience and disaster risk reduction[4]. Thus, it is in the best interest of these developing countries to increase their capacity to access existing ocean information, and supplement that with support for ocean observing programmes in their coastal waters, alongside the development of targeted ocean information services, by taking advantage of capacity development opportunities provided by POGO and other international organisations.

GOOS established a diverse set of "Essential Ocean Variables" (EOVs) which range from physical quantities such as temperature, salinity and sea-level to chemical, biogeochemical and ecosystem variables, and important advances have been made, particularly in the realm of climate-related ocean observations. New and firm commitments are needed from all world nations to measure those EOVs, on a regular and sustained basis. The costs may seem high, especially during periods of economic downturn, but the societal, environmental and economic benefits will be far greater.

We believe that all nations must be involved in establishing the infrastructure that guarantees a manageable future for the global ocean and its resources. More than ever, it is critical that the world's governments prioritise funding of ocean observations and their coordination at the global level, to complete a comprehensive Global Ocean Observing System.

[4] Examples of such services and other activities developed by the GEO Blue Planet Initiative can be found at www.geoblueplanet.org.

About POGO

Since 1999, the Partnership for Observation of the Global Ocean, POGO, has served as a forum for leaders of major oceanographic institutions around the world to promote global oceanography, particularly the implementation of international and integrated ocean observing systems. POGO is an international network of collaborators who foster partnerships that advance efficiency and effectiveness in studying and monitoring the world's oceans on a global scale. Through its efforts, POGO has promoted observations underpinning ocean and climate science, provided training and technology transfer to emerging economies, and built awareness of the many challenges still ahead.

The POGO membership comprises around 40 major oceanographic institutions from around the world, represented by their Directors (see http://ocean-partners.org/members).

Partnership for Observation of the Global Ocean is a charitable incorporated organisation registered and regulated by the Charity Commission of England and Wales, No 1171692.

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pogo Partnership for Observation of the Global Ocean

Annex II: EU – Cabo Verde Cooperation Arrangement

COOPERATION ARRANGEMENT

BETWEEN THE EUROPEAN COMMISSION AND THE GOVERNMENT OF THE REPUBLIC OF CABO VERDE ON MARINE RESEARCH AND INNOVATION COOPERATION

The European Commission and the Government of the Republic of Cabo Verde (hereinafter referred to as 'Sides') recognise that marine research, including ocean research, is a top priority for cooperation and they intend to foster this cooperation.

Research is embedded in the EU-Cabo Verde 'Special Partnership' (hereinafter referred to as 'the Special Partnership'), with a pillar on knowledge-based society. In the EU-Cabo Verde *'Joint Statement on the occasion of the 10th anniversary of the conclusion of the Special Partnership between the EU and the Republic of Cabo Verde'* (10 July 2017), Blue Economy and maritime affairs in general have been recognized as areas of common interest which should be further strengthened and enhanced. Research and Innovation cooperation plays a crucial role within this context.

The Sides acknowledge the key role that oceans play in developing national and regional economies, contributing to achieving sustainable development goals, and addressing climate change, biodiversity, and food security. The Sides are convinced of the mutual benefit that would accrue from linking research activities in the South Atlantic with those in the North Atlantic.

Against this background, the Sides intend to sign this Cooperation Arrangement. It is not intended to create rights and obligations under international law and it has no financial implications.

I. Objectives

The Sides intend to cooperate on marine science, research and innovation aiming at:

- improving the understanding of complex interrelations between various maritime activities and the marine environment with a view to sustainable use of marine resources and valorising the diversity of marine life;
- further developing a common understanding and deepening knowledge of marine ecosystems and the link between the Atlantic ocean and climate change and its impact on citizens and economies;
- encouraging and supporting the development of relevant technologies and research related to the sustainable management of fisheries and the potential of aquaculture;
- exploring international opportunities for sustainable marine cooperation.

II. Areas of cooperation

Both Sides intend to encourage cooperation for a coordinated and partnership-based approach based on mutual benefit in key common areas of interest such as:

- Climate variability and ecosystem approaches;
- Ocean technology and observations (including seabed mapping), forecasting and monitoring processes and systems;
- Food security, fisheries management, aquaculture and biodiversity.

III. Forms of cooperation

Cooperation under this arrangement may include the following forms:

- Exchange of scientific information and engaging in joint priority setting for potential cooperation actions;
- Organisation of and participation in seminars or other meetings on specific agreed topics in the areas described in Section II;
- Organisation of awareness-raising activities and events aiming at the promotion of ocean engaged citizens, including through ocean literacy;
- Actions to promote skills and competence development related to Blue Economy to facilitate human capital development and promote gender equality;
- Optimising the use and sharing of research infrastructures as well as access to and management of data and platforms, subject to applicable rules and regulations of each Side, aiming at increasing operational efficiencies.

Signed in Mindelo on 22 November 2018, in four originals, two in the English language and two in the Portuguese language.

For the European Commission

Carlos Moedas

Commissioner for Research, Science and Innovation

For the Government of the Republic of Cabo Verde

Olavo Correia

Deputy Prime Minister