

**Strengthening Regional Governance of the Oceans in the Southeast Pacific
STRONG High Seas Project**



Attendants to the workshop. Photo by WWF-Colombia

**II Regional Expert Workshop
"Socioeconomic Analysis in ABNJ"
October 23rd to 25th, 2019
Barranquilla, Colombia**

Summary of the workshop

The STRONG High Seas Project is a five-year project that aims to strengthen regional ocean governance for the conservation and sustainable use of marine biodiversity in Areas Beyond National Jurisdiction -ABNJ. In collaboration with the Secretariat of the Permanent Commission for the South Pacific (CPPS), the project aims to develop and propose specific measures to support the coordinated development of integrated and ecosystem-based management approaches for the management of the oceans in the South East Pacific.

Twelve representatives from Colombia, Ecuador, Chile and Peru (Member States of the CPPS) participated in the workshop held in Barranquilla (Colombia). Fifty-two (52) additional people attended the first day of the workshop, which was open to the public attending the National Seminar on Science and Technology of the Sea - Senalmar, representatives of different regional organizations, regional scientific institutions, academic institutions and NGOs. The workshop took place on October 23-25, within the framework of Senalmar. The objective of the workshop was to contribute to the analysis of threats in ABNJ in the Southeast Pacific and to discuss socio-economic aspects of ecosystem services generated in high seas areas, within the framework of the STRONG High Seas project.

Key Messages

- Greater investment and cooperation between countries is required to support research projects on deep-sea biodiversity in high seas areas in the South-East Pacific region. This would allow a better understanding of the ecosystem services that this biodiversity provides to humans.
- The delegation of Colombia (Ministry of Environment) provided examples of how this country is addressing the issue of access to genetic resources and how these procedures would apply to BBNJ. A very interesting discussion was generated due to the different positions and approaches on the subject.
- Presentations were made on traditional approaches used so far to value ecosystem services at sea. However, the importance of examining and implementing new forms of marine resource valuation that do not necessarily involve money (e.g., cultural ecosystem services of ancestral communities) was stressed and discussed.
- The implications of the concept "Common heritage of mankind" for the agreements currently being negotiated and the implications this has for the possible exploitation of resources in ABNJ were discussed at length.
- The lack of knowledge and the great gaps that must be overcome, such as the lack of transfer, were highlighted.
- Participants continued the discussion on the creation of an open access platform for scientific issues in high seas areas of the South East Pacific region. They also discussed the need for a programme to disseminate scientific information on these issues to civil society.

Objective

This expert workshop is expected to contribute to an analysis of threats and socio-economic aspects of ecosystem services generated in the high seas, in the framework of the STRONG High Seas project.

Result 1

In the Atlantic and South-East Pacific, integrated approaches to regional ocean governance for the conservation and sustainable use of biodiversity in marine areas beyond national jurisdiction (ABNJ) have been developed, the technical capacity of national and regional actors has improved and technical and scientific collaboration has been institutionalized.

Activity I.4

Analysis and further development of knowledge on the ecological baseline for each target region, through

- c. A scientific description of the threats to vulnerable marine areas from human activities, including for this case deep sea mining.

Activity I.5

Analysis of the socio-economic importance of NBAs for the target region, through economic valuation of vulnerable marine areas and analysis of economic benefits of important ecosystem services, e.g. food security, as well as the costs of biodiversity loss and ecosystem degradation

Day 1: Wednesday 23 October 2019

Description of the STRONG High Seas project (objectives, partners, geographical coverage) and main objectives of the workshop

Luis Zapata, Coastal Marine Coordinator WWF Colombia

The presentation includes an overview of the STRONG project, which focuses on the governance of ocean areas and aims to strengthen regional governance of the high seas. The project is funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), through the International Climate Initiative (IKI), and coordinated by the Institute for Advanced Studies in Sustainability (IASS). It is an regional work and two areas were chosen to serve as pilot cases for the management and strengthening of ocean areas outside national jurisdiction, one is the zone included in the Abidjan Convention and the other is the case of the Permanent Commission for the South Pacific - CPPS. In the case of South America, we have worked together with the Secretary General of the CPPS as a regional partner, whose work is guided by the criteria that the countries have established in needs and priorities and provides an in-kind contribution to the project.

The objectives of the STRONG project are:

- Facilitate the development of comprehensive and cross-sectoral approaches to the conservation and sustainable use of biodiversity in ABNJ
- Better understanding of the ecological dynamics of the region
- Institutional and legal challenges
- Better understanding of the socio-economic values and challenges in the region
- Develop of options for the region
- Identifies best practices and supports regional institutions and national authorities in implementing existing regional instruments and developing new approaches
- Capacity building in the region on the subject of ABNJ and BBNJ
- Ensure a better understanding of the issues
- Knowledge exchange between regions
- Develop possible options for regional governance in a future international instrument under UNCLOS and transfer regional lessons learned to the global level to promote ocean governance at different scales (not all countries are signatories, but are part of the project to create a binding mechanism, focused on the management of biodiversity in the high seas)
- Exchange of knowledge between the parties
- Support the BBNJ negotiations at the United Nations
- To support the region in its technical processes on issues of regional governance and conservation and sustainable uses of marine biodiversity in the high seas, for decision making
- Develop a stakeholder platform to ensure dialogue on issues of regional governance and conservation of marine biodiversity in the high seas (technical support Universidad Católica del Norte, Chile)

Workshop Expectations

- The 2nd Expert Workshop is expected to contribute to an analysis of threats and socio-economic aspects of ecosystem services generated in the high seas.
- Develop integrated approaches to regional ocean governance for the conservation and sustainable use of biodiversity in ABNJ.
- Improve the technical capacity of national and regional actors and institutionalize technical and scientific collaboration in CPPS member countries.
- To know a scientific description of the threats to vulnerable marine areas by human activities, including for this case deep sea mining.
- Analysis of the socio-economic importance of NBAs for the target region, through economic valuation of vulnerable marine areas and analysis of economic benefits of important ecosystem services such as food security, costs of biodiversity loss and ecosystem degradation.
- Identify the main information gaps in the scientific knowledge of the ABNJ areas of the region.

Summary of the last Dialogue workshop (Guayaquil, February 2019) main results

Jaime Aburto - Catholic University of the North - UCN, Chile

Eight working sessions were held, where topics such as the current state of the projects, progress on ABNJ and BBNJ issues in the region, planning based on ABNJ areas, capacity building, in which decision makers should be involved, the state of biodiversity in the South East Pacific, governance and biodiversity in ABNJ and the focus on the BBNJ negotiations were analyzed.

As for the current state of the project, scientific evaluations and publications have been made on legal and institutional aspects, ecological baseline and technological tools for control and monitoring in ABNJ. The aim is also to evaluate capacities and develop a platform for the involvement of relevant actors. Workshops and training courses were held and participation in the BBNJ negotiations in September/18, March/April and August 2019. Dialogues between relevant actors have been supported. The aim is to test area-based methodologies for ABNJ and provide policy advice.

Debate on some relevant aspects:

- The importance of sharing knowledge and experience on tools between regions.
- Bulletin summarizing connectivity between EEZs and ABNJ, including the migration of marine mega-fauna and analyzing the cumulative impacts in these areas.
- Analysis of governance frameworks, the process under the Convention on Biological Diversity (CBD) on the identification of ecologically and biologically significant marine areas (EBSAs) and marine spatial planning for cross-sectoral management.
- Exchange platform: inventory with different types of information on environmental and social aspects, etc. The idea is to use an available product that people can consult.

- It reiterates the importance of ABNJ for the region and the commitment to the BBNJ process within the United Nations framework for the development of an international agreement on the conservation and sustainable use of marine biodiversity in ABNJ.
- There are elements of convergence in the negotiating package in relation to marine genetic resources, area-based management tools, environmental impact assessments, and capacity building and technology transfer.
- Generation and management of information in the region to fill the knowledge gaps about ABNJ
- The capacity of the CPPS Secretariat to coordinate activities in the region.
- Concern over U.S. decision not to continue funding oceanographic monitoring in the Central Pacific Define alternatives to compensate.
- The effect on the BBNJ process of recent developments at the International Seabed Authority (ISA).

Description of the main advances (preliminary report) of the STRONG High Seas Ecological Baseline analysis.

Gustavo Castellanos - WWF Colombia

The Ecological Baseline document aims to compile and present in language suitable for decision makers, the most relevant and up-to-date information from the Beyond National Jurisdiction Areas in the South East Pacific.

- Main characteristics of the marine environment
- Existing or potential human activities that impact these areas

The report being evaluated contains the following information:

- Oceanography
- Areas of ecological importance (recognized)
- Areas of ecological importance (potential, unrecognized)
- Key biodiversity characteristics
- Distribution of the main living resources (fishery resources)
- Distribution of major non-living resources
- Existing human activities
- Future human activities
- Past and future trends in the state of resources
- Identify information gaps

The sources of information are based on scientific literature, global databases and sources of regional and local experts.

Examples of information: Areas of potential ecological importance, areas less affected by human activity, megafauna, satellite telemetry, charismatic or vulnerable organisms to fishing, maps that summarize tracks. Turtle migration patterns that include ABNJ areas of

the southeast Pacific. Benthic sea floor: hydrothermal vents. Areas of importance for minerals, cobalt deposits Resource extraction: catches by taxon, sea around us database, graphs for the specific area of the southeast Pacific, species and catch volume records, the main one being tunas, catches between 350,000 and 450,000 tons per year.

Collecting information has been a challenge, as it comes from external sources and the resolution is too coarse, there are over-represented groups, smaller organisms have little information available, we seek to integrate the different research initiatives of these other species that are not megafauna. Filling information gaps to feed policy discussions The document should be easy to read for decision makers.

Deep-sea biodiversity of the Southeast Pacific with emphasis on Areas Beyond National Jurisdiction - ABNJ.

Javier Sellanés - Universidad Católica de Norte - UCN, Chile (Video-conference)

General characteristics of the FAO 87 Area in the South-East Pacific on benthic biodiversity

Most important benthic habitats:

- Hydrothermal springs
- Underwater mountains
- Abyssal plain (approx. 4,200 metres)

General characteristics:

- High levels of volcanic activity
- Plate moves at high speed (4-5 cm per year)
- Ridges and mountain ranges and seamounts generated by volcanic activity (zone of divergence, oceanic plate formation)
- Zone enclosed by three ridges (Eastern Pacific, Galapagos and Chile)
- High primary productivity in the coastal area, mainly associated with the Humboldt current
- Towards the center of the area (Southeast Pacific Gyre zone), it is considered an ultra-oligotrophic zone thanks to the low levels of primary productivity only on the surface, towards the center the high levels of chlorophyll deepen, higher levels of primary productivity at 150 meters depth
- Minimum oxygen zones (MOZs), for the benthic and deep environment in ABNJ, are with minimum oxygen areas

As for the benthic biodiversity of the area found through OBIS, Ocean Biographic Information System, with a back up of 57 million records worldwide, is that between 0 and 11,000 meters deep, there are hundreds of thousands of records per quadrant, from 50 meters deep changes quite a lot the amount of records we have, the deeper the biodiversity records decrease. There are only 2,940 records for the Southeast Pacific area, between 3,000 and 11,000 meters deep, between 2000 and 2019, only 119 records have been added, and there are not many studies on the subject at present.

The GBIF database includes land records, most of them in developed countries, most of the South East Pacific area does not have a large number of records, in general there are very few on biodiversity.

MORE CHARACTERISTIC BENTHIC HABITATS:

- Hydrothermal sources maintained by primary chemosynthetic production
- Very pronounced chemical and thermal gradients
- It is estimated that there are 500-1000 hydrothermal sources in the world, which are distributed on the oceanic ridges. Galapagos Ridge, Eastern South Pacific and Chile Ridge; 35 active observed, 36 active inferred, seven inactive. All the fauna that inhabits this area is classified as endemic to this type of environment, it is also visited by fauna that is not necessarily from this habitat, but that are being opportunistic and benefit from the chemical matter that originates there.

Less than 20% of the ocean's crust has been explored for hydrothermal activity. The Southeast Pacific Ridge is the area that hosts the largest number of hydrothermal sources in the FAO 87 area, mostly in ABNJ. The rate of expansion is between 40 to 55 mm per year. There is also a high rate of hydrothermal source formation in this area, with a short distance of approximately 100 km between each source. Zone with a lot of potential to find new hydrothermal sources. In this area there are flows of material of origin, geofluids, precipitation of chemical compounds that form these polymetallic deposits of high interest for the mining industry. Most of these potentially exploitable polymetallic deposits are located in the dorsal area of the South East Pacific. The Galapagos Ridge and the Pacific Ridge form two biogeographic provinces in the FAO 87 area. However, some barrier to dispersal in Ecuador prevents the flow of a significant number of species.

- **SUBMARINE MOUNTAINS:** Areas of high biodiversity and productivity, they are areas of larval retention and aggregation, areas of aggregation of pelagic predators, provide protection and food for migratory species and are therefore considered "Hotspots" of diversity and endemism. They are very isolated areas, which produces speciation and endemism, have a low resilience, the species are very sensitive and / or slow growing, with very long life cycles, the size of first reproduction of some fish species, take up to 30 or 40 years. This causes for example the collapse of fisheries on the seamounts where they are conducted. It is estimated that there are around 940 seamounts in the FAO 87 area (700 in ABNJ). 8 % of the world's seamounts are in this area, but only 22 of these have been sampled. As for these geological formations, the Nazca mountain range and Salas Gomez have been declared EBSAs by the CBD. In previous studies from 1997, it was found that there are many invertebrate and fish genera represented by a few species. There is a great diversity at the specific level and also at the generic level, 226 species of invertebrates have been described, mainly of megafauna, only focusing on the largest species. It also includes 170 species of fish. The same study shows a level of endemism of 46.3%, considered to be among the highest worldwide, and 41% endemism only in fish.

It is very expensive to do research in the area, so there are not many projects in the region.

- **PLANICIE ABISAL:** the largest environment in the area, it is located between 2,000 and 6,000 meters deep, the ecosystems are maintained mainly by primary production on the surface, by the help of the detritus and organic matter that comes from the surface. It is the largest habitat on the planet, covering about 50% of the planet's surface, and making up approximately 70% of the seabed. The plain plays a very important role in the biogeochemical cycles and as a carbon sink. Much of the anthropogenic carbon is being captured by the ocean and much of it is buried in the abyssal plain. The biomass of the fauna is low, not necessarily the diversity.

QUESTIONS

WHAT IS THE RESEARCH PERSPECTIVE AT THE REGIONAL LEVEL OF THESE HABITATS IN WHICH IT IS DIFFICULT TO CARRY OUT RESEARCH, HOW CAN WE ADVANCE IN KNOWLEDGE OF THE REGION?

Considering the high costs of conducting research cruises to these areas, about 26,000 USD per day, is very high and there are no local instruments that finance trips of this magnitude. This makes research in these benthic areas difficult. Agreements between countries, joint studies are required to increase the scientific capacity of the area.

Genetic resources and derived products under ABNJ.

Paula Andrea Rojas Gutiérrez, Ministry of Environment and Sustainable Development -MADS Colombia

What is ABS?

It refers to how genetic resources can be accessed, and how benefits from their use are shared between the persons or countries that use those resources (users) and the persons or countries that provide them (providers). It operates with Prior Informed Consent (PIC) given by the provider to the user and is an agreement between them to develop mutually agreed terms (MAT) to ensure that benefits arising from the use of genetic resources are shared equitably.

The ABS process consists of a system that manages genetic resources for conservation and use, both in situ and ex situ. They also relate it to traditional knowledge.

Among the non-monetary benefits are: Research and development, training and education, and technology transfer. Monetary benefits include royalty payments and intellectual property rights.

There are two uses for genetic resources, commercial and non-commercial. Among the non-commercial uses are taxonomy and conservation, and among the commercial uses are those for the agricultural industry, bioremediation, biomedicine, cosmetics and the food industry, among others.

The issue of genetic resources is related to ABNJ, in the issue of bioprospecting, when benefit-sharing begins to be evaluated. In Colombia, biological resources are interpreted as: individuals, organisms or parts thereof, populations or any biotic component of actual or potential value or utility contained in the genetic resource or its derived products. Its

interpretation is an organism or its parts from an individual cell to the complete organism, for unicellular organisms it will include the complete organism.

The definition of genetic resource is any material of biological nature containing genetic information of actual or potential value or utility. It is interpreted as hereditary material, which contains all the information necessary to generate an organism and keep it alive. In the case of viruses, viroids and similar, it is hereditary material that allows replication.

Derived products are a topic of attention since developments in bioprospecting projects have an economic value because of the derived products. Per se the genetic resource is important for the generation of information, but when talking about the negotiation of the instrument, should the discussion of the derivative products be linked, which are the molecules, the combination or the mixture of the molecules coming from a metabolism and what is patented is the product or the procedure? In the case of the genetic resources, this generates a discussion about the ingredients of these genetic resources. In Colombia there is an ambiguous interpretation framework since 1997, which says that the derived products are part of the genetic resource.

Value derived product: patents are reviewed for pharmaceutical, food, cosmetic industry. And we look at traceability and the importance of the derived resource.

In Colombia there is a regime for access to genetic resources that applies to derived products and there is a differentiation of regulation and now the raw extracts do not apply as derived products and the regime for access to genetic resources does not apply, since there is no molecular activity.

Ways to access genetic resources: in situ, ex situ, In silico, digital sequence information (DSI). This topic presents great battles in the negotiation processes, since they say that the digital sequences are not part of the genetic resources, the positions on the subject are scattered.

Another important issue is synthetic biology: what will happen to these organisms that are the product of synthetic biology? These organisms are part of the mandate of biodiversity agreements. Synthetic biology is defined as the synthesis of biomolecules or engineering of biological systems with new functions not found in their nature. This generates a discussion, if the product, is a product of synthetic biology its base is not natural and megadiverse countries have no mandate on the products of synthetic biology.

The activities that make up access are, biological prospecting for commercial and industrial purposes, they can subscribe to the genetic resource access contract and they are given a collection permit.

Conpes 3697 defines bioprospecting as the systematic and sustainable exploration of biodiversity in order to identify and obtain new sources of genetic products.

Res. 1348 of 2014 says that activities shape access to genetic resources and about which species:

- The separation of functional and non-functional units of DNA and/or RNA, in all forms found in nature

- The isolation of one or more molecules, understood as micro and macro molecules, produced by the metabolism of an organism
- A patent application for products or processes obtained or developed from genetic resources or their derived products

In Colombia there are currently 329 contracts for access to genetic resources, only 11 commercial, 19 framework contracts and 299 research contracts, most of which do not scale to the next phase due to lack of economic resources, and therefore do not scale to the commercial phase. 63 projects added, 14 patents derived from the contracts.

Main beneficiaries in marine ecosystems in Colombia:

| Solicitante | Nombre del proyecto |
|----------------------------------|--|
| Universidad Nacional de Colombia | Bioprospección de microorganismos marinos de Colombia. |
| Universidad Nacional de Colombia | Detección, purificación y caracterización bioquímica y funcional de lectinas presentes en algas marinas colombianas. |
| Invermar | Búsqueda de sustancias activas de microorganismos de ambientes marino – costeros para su potencial aplicación en los sectores: Salud, Industria, Agropecuario y Ambiente. |
| Invermar | Obtención de extractos de organismos marinos para pruebas de actividad biológica antimicrobiano. |
| Universidad de Antioquia | Estudio químico y de actividad biológica de compuestos extraídos de esponjas marinas colombianas. |
| Universidad de Antioquia | Ingeniería genética: estrategia molecular para el mejoramiento del proceso de producción de ficobiliproteínas a partir de la microalga <i>Porphyridium cruentum</i>. |
| Universidad de la Sabana | Bioprospección de octocorales del Caribe Colombiano, como una fuente potencial de compuestos citotóxicos. |
| Universidad de la Sabana | Diversidad taxonómica, funcional y bioprospección de la microbiota de ambientes salinos en Colombia. |

GENETIC RESOURCES IN THE GLOBAL AGENDA: it is on the rise in different instruments in CBD, ITPGRFA (International Treaty on Plant Genetic Resources for Food and Agriculture), industrial property, synthetic biology, post 2020 agenda and in BBNJ.

This issue is on the agenda of all countries as a very advanced development potential within the line of conservation and use. A mandate is being sought that will allow them to negotiate as negotiating partners; legally robust instruments must exist.

QUESTIONS: State positions on the issue: although we are not committed as a country it is possible to access resources in an individual way, there is some collective position action, how useful is it for the CPPS to implement a collective block position, so as not to have to go for particular interests?

The advantage of negotiating en bloc, as a group of mega-diverse countries that meet to take a joint position to the COP, generates guarantees of having a greater voice when several countries are in the line of negotiation.

In Colombia, there are still many challenges and there is no agreed position, it is still under discussion, Colombia does not propose a massive exploitation, only an opportunity to exploit as long as it follows a line of conservation and use. In BBNJ, we see a great opportunity since there is no sovereign jurisdiction to make decisions, although there is already unregulated exploitation in those areas which should be implemented with minimum measures to be regulated for the benefit of all those who are part of the instrument.

Submarine mining in the Pacific Ocean: socio-economic and political implications for CPPS and developing countries.

Sandor Mulsow - Universidad Austral de Chile, Former Director of the Office of Environmental Management and Mineral Resources - AIFM

Minerals are the common heritage of mankind, governments must be the guarantors of the protection of the ocean floor, they must encourage marine research, they must assure all members that the benefits of exploitation will be shared.

The International Seabed Authority is the regulatory body for natural resources found on the seabed. If at any time these goods are exploited they must ensure that the benefits will be shared by mankind.

167 state members have signed the regulations regarding underwater mining.

DEVELOPMENT OF THE MINING ACTIVITY IN THE AREA

There are 17 exploration contracts in progress for manganese nodules in the North Pacific.

Most European countries, especially the United Kingdom, own the largest manganese nodules. The way the activity is regulated, that is each member state supports an application for exploration, prospected a larger area and then provides the authority with two areas, one left as a reserve for underdeveloped countries, which is called the parallel plan to apply for an exploration contract, but since 2012 this has changed.

Which countries have these 18 contracts of the nodules (polymetallic nodules)? Fifty percent of the concessions are from the British Commonwealth.

In that the common good is used, most gold is used in jewelry, silver 33% is jewelry, as citizens of the world we must ask ourselves are we doing the right thing with this? The only thing being handled is economic opportunities, nothing else, we are not responding to any need for human welfare.

The biggest problem that underwater mining has for developing countries is that the markets that control commodity prices are very volatile, which means that it responds to speculation.

South Africa has a monopoly on manganese mines, and manganese is worth six times less than copper.

In terms of climate change, producing primary minerals (when you take it out of something and modify it) the amount of CO₂ per kilo produced per ore is high, one kilo of copper

produces 10 kilos of CO₂, so in terms of climate change we should not do underwater mining.

The cost of a research cruise to the manganese area: between 1.4 and 2.5 million dollars. In the sampling effort, every 200 km² there is an environmental sample, the ocean is being intervened at all levels, populations are decreasing because calcium is dissolving, due to the acidification of the waters that are passing over, these phenomena have occurred very quickly. Many communities have not survived because they cannot maintain their skeleton, they cannot calcify it because it is dissolving. Significantly, it has been estimated that 2-9% of the calcium carbonate is dissolving in the ocean.

The current sampling resolution of ISA is one sample per 1000 km², and current sampling efforts fall far short of what is needed to properly understand harmful effects at sea depths. They should conduct a research cruise every 3 months to really understand the impact we are having on the oceans.

Conclusions:

- We have a solid set of rules and regulations that must be adhered to, not overwritten by new ones.
- There are too many knowledge gaps for proper management of high seas resources. The performance of contractors must be enforced.
- The economy does not add up to explain deep sea mining as an emerging industry yet.
- The resources of the high seas are considered as the common heritage of mankind, their benefits are for all and for peace, without any negative socio-economic impact of the developing Member States.
- The deep ocean has begun to modify fundamental ecological functions: the geochemical regulation of acidity. This implies the extinction of calcifying species in the water column and deep-sea inhabitants.
- Developing countries will be able to accept ISA-UK-driven business. The knowledge is available. The land-based Cu and Mn miner will lose his advantage in the Cu and Mn market. Deep negative impacts at the socio-economic level.
- A moratorium on underwater mining.
- Incorporate circular economy parameters into our economic model.
- For REE (rare earth chemicals), the specific emissions avoided by state-of-the-art recycling are reported to be even higher. Recycling of REE would also provide significant benefits with respect to groundwater protection, acidification, eutrophication and climate protection. (To obtain one gram of rare earth, I must move 6 tons of soil. (REE) are not very abundant).
- We should not ignore the fact that extracting metals with modern recycling processes is 2 to 10 times more energy efficient than smelting metals from ores. 1 kg Cu ore equals 10 kg CO₂, 1 kg Cu recycling equals 1 kg CO₂ and is more energy efficient than smelting ore.
- The CPPS does not have a political position on the issue, even though several of its members are and will be land-based miners.

The contribution of the marine ecosystems of the Tropical Eastern Pacific to economic and social well-being.

Cesar Viteri Mejia - Charles Darwin Foundation

The global ocean economy is estimated to be about \$1.5 trillion in gross value added in 2010, which is an underestimate because with current tools limited to the instrumental type that countries have to monitor their economy, ecosystem services that are not currently being valued at market prices are not considered. There is an estimate made for Colombia, where it was estimated that about 12% of the GDP came from ocean-related activities. About 31 million jobs depend directly on the ocean, but this is an underestimate as artisanal fisheries are not taken into account.

In terms of the value of the ocean's assets globally, the most valuable are those related to tourism and fisheries, and the mangrove ecosystems that are highly productive. The number of ocean-related jobs is estimated at 500 million when all are taken into account.

The economy of the oceans consists of all the economic activities that occur in them, activities that take place on land that depend on the ocean (fish processing, desalination) and activities that occur properly on land but support activities in the ocean, such as boat building and the management of related businesses.

There are a number of industries related to the oceans, and if we think about one of those activities, such as fisheries globally, which are generating 200 billion dollars a year. But these types of measurements are underestimates because they don't take into account certain variables such as the fact that around 82 billion dollars are lost due to bad fishing practices. One billion people depend on fisheries as their main source of nutrition and livelihood.

In the ocean, which is a space where a series of economic activities and competing interests converge, it is diminished by some conflicts that force a bad management of resources in these spaces, conflicts such as overexploitation and degradation and loss of well-being. In this case, economic analysis can guide decision making to ensure sustainability.

To value natural capital, the externalities that are generated in production are usually the result of ignoring the value of nature in decision making, and the solution includes

- Valuation of ecosystem services, for example, the mangrove is valued at \$61 million per year, for services to the tourism industry in Galapagos.
- To demonstrate the profitability of fisheries under better management schemes. For example, using economic instruments, it is possible to evaluate the profitability and cost benefit of applying different management schemes to the fisheries and demonstrate that profitability can be better.
- The use of economic analysis to analyze dilemmas in the use of natural resources. For example, Lynham *et al.* 2014, estimate the value of a Galapagos shark at \$360,000 for tourism vs. \$158 for fishing.

How to address the economic causes of ocean degradation

- Valuing the assets that the ocean possesses to reduce externalities.
- Integrate the value of the oceans into national accounts to alleviate existing information asymmetries
- Internalize the value of natural capital in private sector decision-making.

The blue economy program has three main components:

1. Work with governments to value the natural capital of the ocean, such as mangroves and fisheries, so that these assets are included in national accounts. Destroying or degrading them, results in a decrease in national GDP.
2. Working with businesses, so that they can assess their impacts and dependence on ocean resources and help them design sustainable business models.
3. Incentives are provided to small and medium enterprises through contingent leadership to expand the implementation in industries of best practices in the ocean sectors (fisheries, aquaculture, etc.).

In the case of the oceans there is an initiative called the Global Oceans Account Partnership, which is led by the Economic and Social Commission for Asia and the Pacific and is used to value ocean ecosystem services.

Update on the status of the BBNJ treaty negotiations.

Gustavo Arévalo- Director of Legal Affairs CPPS

An account is made of the BBNJ process from 1972 to the present, this is a multilateral negotiation, with international organizations as observers, the negotiation is an effective instrument, whose purpose is to establish a treaty.

An account is given of the concepts and articles that appear in the treaty and that generate strong debate, such as what is meant by transfer of marine technology: elements such as information and data provided in a user-friendly format, on marine science and related marine operations and services. It is precisely the developing countries that need these concepts to be clarified, so that they can count on marine technology transfer and capacity building. The EU states point out that this is not necessary because the CONVEMAR, does not define and it is not possible to go further, which generates a debate and it is difficult to move forward with the gaps that exist. This can affect the effectiveness of the agreement.

Cooperation should be promoted among the states party to the agreement.

Most countries propose replacing words with a more imperative, more emphatic sense, for example, instead of talking about promoting, talking about creating.

Marine genetic resources are the common heritage of mankind or are generally offshore resources. RGM, PRINCIPLE OF FREEDOM OF THE HIGH SEAS, ? Some countries do not support this.

With regard to environmental impact assessments, the intention is that all countries should require them, since not all countries are obliged to do so and this may have a negative

impact on marine ecosystems. What the agreement proposes is to help states through a series of criteria or thresholds of when it will be necessary for the state to require environmental impact assessment, this helps states to identify when assessment is necessary. The state must correctly require the evaluation or not, when a state considers that it is not necessary, its decision will be subject to an evaluation by a scientific body where it will be corroborated that the state is correct.

Group discussion, CPPS and WWF moderation

Negotiations are driven by interests, natural resources are treated as public goods in the current system of government and economy. All negotiations are driven by interests.

As a region, we must establish a mechanism to be able to talk, so that when appropriate we can make decisions. It is important that we all sit down and talk and work with the Secretary so that we can come to the negotiations with a single regional position, to form a block and to have greater strength, weight and reaction.

All CPPS member states have similar but not equal interests. The CPPS can be the place where the four countries can discuss their specific situations and agree, as well as discuss our different visions.

DAY 2. Day 1: Thursday 24 October 2019

Socio-Economic Aspects of the BBNJ- The Value of Greater Cooperation.

Jessica Battle Senior Expert on Global Ocean Policy and Governance WWF Int.

As it is well known the ocean provides many benefits to our planet, in fact, in a recent study the ocean is put as the seventh largest economy compared to the economies of the countries, a very interesting fact. Yet we are not contributing to the ocean, and we have declining trends in species, fisheries, habitats, and oxygen levels. This is affecting the economic potential of the ocean to help sustain our coastal, national and global economies.

So for the BBNJ treaty, which is of course about ABNJ, it is very important because more and more activities are taking place in the ocean, which includes many more actors in them. It is not only about fishing, but now there are more efficient vessels, and more and more uses of the ocean, so continuing business as usual, "Business as usual", is not going to work anymore, if we want to restore and protect the economic potential that the ocean provides.

There is also more knowledge about the connections between the coasts and the people who live there and generate income and food, which comes from the sea and the ABNJ. These connections are best understood in terms of currents, and how fish move, and also in terms of other connections such as with migratory whales. So what is required is to stop seeing the ocean as something that does not belong to anyone, as we all have rights and duties, which are not being taken into account. So the vision of WWF and various states now, is to see the ocean in a different way. Countries collaborate on ocean issues, we

would like to see the oceans managed through an integrated and holistic mechanism. And this is based on what the marine ecosystem can sustain, in terms of food and other ecosystem services. And this vision is that states should be more collaborative and accountable, while fulfilling their obligations and responsibilities that they had to do with each other and other international entities.

It is very important that there is cooperation between sectors and between jurisdictions, and also between coastal states and outside on the high seas, as significant impacts affecting the oceans are increasingly being seen. In a more legal view, UNCLOS has a general obligation to cooperate and this obligation must be implemented through this cooperative regime.

In terms of the treaty and socio-economic aspects, migratory species are important for tourism, this sector can affect local and coastal businesses, and this is happening to many coastal states and islands. It is necessary to think about how regional mechanisms are respecting treaties on how to manage ocean space in international waters, as these states are important actors for NBAs.

We would like to see through the ABNJ treaty, a way to implement global standards for decision making. The United Nations resolutions at the General Assembly level are being implemented on a large regional scale and we suggest doing it on an ocean scale. Because this scale is really where coastal states and islands can come together and cooperate to achieve the goals they have set for themselves, in terms of treaties.

For protected areas, there should be a forum where coastal and fishing states can meet to decide on how to manage these areas, which are important to their economic interests.

The management of the oceans should not be done on a sectoral basis, there is a need for cooperation between all sectors and different actors and for collaboration between them.

Approaches to marine area assessment: challenges and possible applications to NBAs in the South East Pacific.

Marcelo Olivares - Catholic University of the North - UCN, Chile

Topics to be covered:

- In the framework of the STRONG project, the development of an analysis of the socio-economic importance of NBAs is carried out
- Work in the information review and design stage
- Reduced literature on marine ecosystem valuation
- The objective is to show how the valuation of ecosystem services is approached from the economic point of view, by presenting some particular cases (studies) as an input for discussion.

With respect to the economic value, this is an anthropocentric idea, the economic value is given to the ecosystems by the people, insofar as these ecosystems affect the human welfare, therefore, what happens in the interaction and development of the ecosystems and their different functions, is generating services that are the ones that finally generate these benefits to the human being. Likewise, these benefits are providing feedback to the

way in which institutions are configured and human judgment about this also defines the management of ecosystems or the lack thereof.

The ecosystem services of the High Seas areas are provisioning services, such as food, raw materials; there are regulating services, such as climate regulation, carbon sequestration; also supporting services, such as nutrient recycling and primary production; and cultural services of recreation, spirituality, science, history and education.

In consideration of the different services of the marine environment, the concept of total economic value is raised, which recognizes that there is not only a use value, but also an option value and a non-use value. Use value includes direct and indirect use, such as food, livelihood and ecological functions, option value is for future uses and non-use value can be altruistic, by inheritance and existence. The idea of economic value is based on the utilitarian vision: the best action is the one that produces the greatest utility, for the greatest number of people involved, the one that maximizes the utility.

The reason why ecosystem services are valued, firstly, to raise awareness of the value of the marine environment, to make visible the existence and distribution of costs and benefits of their use, to evaluate management plans and to compare costs and benefits of alternative uses, is important to value because it allows the creation of markets, such as payments for environmental services.

Valuation principles and approach: when markets exist for products associated with ES, such as fisheries, we can use market prices as a value reference

Value = P x Q

Therefore, that production that is being traded in the market, we can value it directly by observing the prices that are being defined, where the value will be the multiplication between prices and quantities, so the value can increase by any of the two variables, by the willingness to pay of people or by the quantities that are being traded in the market. However, when markets do not exist it is necessary to use alternative valuation methods, based on the preferences of individuals (related or hypothetical).

In the case of the fisheries sector, the value of this sector directly influences the value of landings. However, the sector also generates benefits through the processing, distribution and final consumers of the various fishery products. Therefore, it is important not only to value in terms of the product landed, but also the series of linkages associated with the fisheries sector and ideally a comprehensive analysis of the value chain and the impact on other sectors of the economy. It should also allow the identification of the multipliers associated with the sector, i.e. how many additional dollars are generated for each dollar of landed value. However, this analysis is not trivial, some national accounts consider it, there are input-output matrices that manage to identify parts of these relationships, but the cases in which these exist are updated and are made on productive sectors grouped in a more general way, as for example, in the case of Chile we talk about the forestry, agriculture and fishing sector, this makes it very difficult to separate or identify what is the effect that the fishing sector has on the rest of the economy.

Taking a case study on the fishing sector of Peru, the methods used to value from the market can be evidenced:

- Structure the value chain to describe the flow of fish products between companies to the consumer.
- Combine information from official statistics, direct observation and interviews with informants regarding crew size, employment in processing plants, cost structures, among others.
- In terms of results they present the benefits through the trigger that is generated from that activity to be valued.

For those ecosystem services that cannot be valued through the market, in that there are no markets for these services, it is possible to value them through stated preference approaches (i.e. asking people directly how much you would value these situations), based on simulated markets. This is based on the theory of reasoned action, which tries to predict human behavior, then you have a series of demographic variables, as personality traits, which will define beliefs, which will lead to different attitudes and finally to a predicted behavior which is what interests us through the willingness to pay of people in a given situation. This willingness to pay can be associated with a particular change or a set of changes that are associated, in this case, with biodiversity and the value of existence on the sea floor.

The application of this type of method seeks:

Motivation:

- Importance of the seafloor in providing ecosystem services for the provisioning, regulation and support of life through the circulation of nutrients and habitat for species
- In general, the greatest challenge in assigning an economic value to these services and deep-sea biodiversity is not a lack of scientific knowledge, but a lack of knowledge on the part of the population.
- However, people are capable of learning, forming their preferences (based on information about attributes, their personal attitudes and beliefs) and valuing.

Conclusions:

- People care about protecting vulnerable areas despite their unfamiliarity and remoteness. However, lack of knowledge rather than lack of interest would explain the near-absence of social values.
- Understanding and quantifying the link between biophysical processes and the provision of ecosystem services is necessary to approximate monetary values to the costs of biodiversity loss and ecosystem degradation.
- Given the limitations of the economic approach to the (monetary) valuation of marine ecosystems, it is necessary to complement any estimate of their value with a description of those services whose value cannot be quantified.

Challenges associated with the Socio-Economic Assessment of High Seas in the framework of the STRONG project

- To what extent is it possible to establish a relationship between the biophysical functions of the high seas and the provision of ecosystem services?
- Can we consider as valid the extrapolation of parameters or data or the adoption of ecosystem service assessments carried out in other contexts and/or regions?
- Distinction/relationship between the "ocean economy" and the economic value of international waters Should we treat it as equivalent? Should the analysis be developed for all economic activity with an ocean origin?
- What sources of information can be identified that give an idea of the organization of national industries and in particular of the ownership of companies/conglomerates?
- Possibilities of identifying who gets the benefits versus who assumes the costs

What do the CPPS countries expect from ABNJ's socio-economic issues? Group discussion, UCN moderation

TOPICS FOR DISCUSSION

- MARINE GENETIC RESOURCES
- VALUATION OF MARINE RESOURCES
- GENERAL FRAMEWORK OF THE AGREEMENT (Instruments)
- HOW TO OVERCOME KNOWLEDGE GAPS
- IMPLICATIONS FOR REGIONAL GOVERNANCE OF THE POINTS DISCUSSED

Some reflections to contribute to the discussion of a framework for the socio-economic-environmental assessment of the High Seas ocean system for the East Pacific region.

Beatriz Yanicelli - UCN, Chile

- What does the global climate and the global market mean at the local level? And internationally?
- The three "no sense" dichotomies: Biodiversity, on exploitation and climate change
- There are new paradigms about biology, evolution and the nature of human consciousness and connectivity
- Dizzying moment in terms of scientific and technological progress
- Our current approaches are "limited" within a possible framework, based on assumptions that are no longer sustainable
- Stiglits, Pettifor, etc, the present economic model with environmental sustainability (regularizing the financial sector) is not sustainable. Debt crisis-environment
- How to include the value that the raw material has for the country that imports?

- Which way to go? Parallel development? Do we address it for the region? Do we forget and use the standard tools?

Round table discussion on the topics covered in the workshop, followed by Plenary

Marine genetic resources: first theme Access

Access in situ, ex situ: many of the documents do not want to recognize the derivative products, which are not only of scientific interest, but also of knowledge generation. It is important to recognize the derived product and its categories from which it is possible to have access to those genetic resources.

Benefit sharing has an edge that is fair and equitable, and the discussion is what will be the mechanism for making a fair distribution and that this benefit sharing will be received. Within these issues of access to resources, the utilization of the genetic resource always comes to light, since from here on it must be established whether we are talking about the economic resource or the creation of knowledge.

Another issue that was raised is the conservation of resources: This issue must radiate information such as knowledge on biodiversity. When a bioprospecting study is carried out, it should not be compared with a mining extraction process because it is not, that is molecular biology, small samples are taken and taken to a laboratory to know their genetic expression and synthesize, from here the molecules of interest are sought. In bioprospecting, the environmental impacts of mining do not exist. Within the topic of use and bioprospecting projects, the following can be found

- Generation of information
- Use of biodiversity
- Taxonomy
- Strengthening knowledge for decision making regarding the ecological status of species
- Technology
- Monitoring
- Monitoring capacity

The common heritage of humanity and freedom on the high seas, these two concepts directly impact the management and handling of genetic resources, because benefit sharing can always be controlled, that this sharing can be done through a global multilateral mechanism of participation. This mechanism will be in charge of the administration and distribution of benefits from bioprospecting projects.

Among the objectives pursued by the STRONG High Seas project is the creation of a platform for data transfer, the cost of a platform was discussed, and the CPPS suggested that the academy take charge of maintaining a database.

Sandor says that as part of his work at ISA, a platform was created to store databases with information on marine projects and the goal is that this platform will be the host of any marine database, free of charge. There are about 300 databases worldwide of the ocean alone and only 15 are active.

In order to achieve data and information sharing among states, there must first be political will on the part of the countries and institutions generating the data.

Workshop Agenda

| Day 1: Wednesday 23 October 2019 | |
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| Place: Centro de Convenciones Universidad del Atlántico | |
| <u>8:45 – 9:00</u> | Registration - Welcome Coffee |
| <u>9:00 – 9:20</u> | Opening (CPPS and WWF Colombia), STRONG High Seas project) <i>Mentor Villagómez - Secretary General CPPS and Luis Zapata - Coastal Marine Coordinator WWF Colombia</i> |
| <u>9:20 – 9:35</u> | Short presentations by participants <i>All the guests</i> |
| <u>9:35 – 9:50</u> | Description of the STRONG High Seas project (objectives, partners, geographical coverage) and main objectives of the workshop <i>Luis Zapata, Coastal Marine Coordinator WWF Colombia</i> |
| <u>9:50 – 10:20</u> | Summary of the last Dialogue workshop (Guayaquil, March 2019) main results <i>Jaime Aburto - Catholic University of the North - UCN, Chile</i> |
| <u>10:20 – 10:50</u> | <i>Coffee break</i> |
| <u>10:50 – 11:20</u> | Description of the STRONG High Seas Ecological Baseline Analysis (under revision) <i>Gustavo Castellanos - WWF Colombia</i> |
| <u>11:20 – 12:00</u> | Deep-sea biodiversity in the Southeast Pacific with emphasis on Areas Beyond National Jurisdiction - ABNJ <i>Javier Sellanés - Universidad Católica de Norte - UCN, Chile</i> <i>Video conference?</i> |
| <u>12:00 – 12:30</u> | Genetic resources and derived products under ABNJ <i>Paula Andrea Rojas Gutiérrez, Ministry of Environment and Sustainable Development -MADS Colombia</i> |
| <u>12:30 – 14:00</u> | <i>Lunch</i> |
| <u>14:00 – 14:45</u> | Submarine mining in the Pacific Ocean: socio-economic and policy implications for CPPS and developing countries <i>Sandor Mulsow - Universidad Austral de Chile</i> <i>Former Director, Office of Environmental Management and Mineral Resources - IAMF</i> |
| <u>14:45 – 15:15</u> | The Contribution of Tropical Eastern Pacific Marine Ecosystems to Economic and Social Well-Being <i>Cesar Viteri Mejia - Charles Darwin Foundation</i> |
| <u>15:15 -16:00</u> | Fishing in offshore areas and the feasibility of monitoring, control and surveillance <i>Juan Mayorga, University of California Santa Barbara</i> <i>Video conference</i> |
| <u>16:00 – 16:30</u> | <i>Coffee break</i> |
| <u>16:30 – 17:00</u> | Discussion of the topics discussed during the day <i>UCN moderation</i> |
| <u>17:00 – 17:30</u> | Closing of the first day of the workshop and feedback |

| Day 2: Thursday 24 October 2019 | |
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| Place: Escuela de Suboficiales Armada Nacional de Colombia | |
| <u>8:30 – 9:30</u> | Approaches to marine area assessment: challenges and possible applications to NBAs in the South East Pacific <i>Marcelo Olivares - Catholic University of the North - UCN, Chile</i> |
| <u>9:30 – 10:30</u> | What do the CPPS countries expect from this issue? Group discussion <i>UCN moderation</i> |
| <u>10:30 – 11:00</u> | <u>Coffee break</u> |
| <u>11:00 – 12:00</u> | Update on the status of the BBNJ treaty negotiations <i>Gustavo Arévalo- Director of Legal Affairs CPPS</i> |
| <u>12:00 – 12:30</u> | Group discussion <i>CPPS moderation</i> |
| <u>12:30 – 14:00</u> | <u>Lunch</u> |
| <u>14:00 – 15:00</u> | Round table discussion on the topics covered in the workshop followed by Plenary <i>Moderator: Luis Zapata - -Coordinador marino costero WWF Colombia y</i> <i>Beatriz Yanicelli, Universidad Católica de Norte - UCN, Chile</i> |
| <u>15:00 – 16:00</u> | Planning future actions and closing the workshop <i>Mentor Villagómez - Secretary General CPPS and</i> <i>Luis Zapata - Coastal Marine Coordinator WWF Colombia</i> |

List of Workshop Participants

| Name | Affiliation |
|---------------------------|-------------------------------------|
| Adriana Melissa Medina P. | Universidad de Atlántico |
| Dorandy Escorceu | Universidad de Atlántico |
| Yarethis Coronado | Universidad de Atlántico |
| Leslie Fozo | Universidad de Atlántico |
| Jhon Ramirez | Universidad Antioquia |
| Andrea Aguilar | WWF Colombia |
| Emmanuela Daza | CEMarin |
| César Viteri | Foundation Charles Darwin – Ecuador |
| Luis Alonso Zapata | WWF Colombia |
| Mishell Rivera Martinez | Universidad de Atlántico |
| Santiago Torrenega | Universidad de Atlántico |
| Thomas Dallares Rangel | Universidad de Atlántico |
| Mariuxi Yepez | CPPS |
| Anubis Velez Mendoza | Universidad de Atlántico |
| Daniel Rodríguez | Universidad Magdalena |
| Diana Quintana | DIMAR |
| Laura Camadro J. | Parques Nacionales |
| Isabel C. Avila | CVC – UniValle |
| Estefania Isaza | UniValle |
| Lia Quillot I. | WWF Colombia |
| Maria Jesús Ovalle | MMA – Chile |
| Sandor Muslow | VALN – Chile |
| Jaime Aburto | UCN – Chile |
| Beatriz Yannicelli | UCN – Chile |
| Gustavo Arévalo | CPPS |
| Méntor Villagómez | CPPS |
| Giovanna Sotil C. | IMARPE |
| Victor Masson | MREMH – Ecuador |
| Ximena Carranza H. | MinAmbiente |
| Carlos A. Garcia Arzote | Universidad de Atlántico |
| Mónica Espinoza M. | Global Fishing Watch |
| Rafael Hurtado | Comisión Colombiana del Océano |
| Marcia Zambrano | Universidad Antioquia |
| Maria A. Ferrer H. | Universidad de Atlántico |
| Lorence Cabora I. | Universidad de Atlántico |
| César Grisoles | DCMAR |
| Valentina Cubo | Universidad de Atlántico |
| Jorge Pérez J. | Universidad de Atlántico |
| María Gallego | Universidad de Atlántico |
| Doliany Lopez Munoz | Universidad de Atlántico |
| Janna Gonzalez Cano | Universidad de Atlántico |
| Leonorda Donúfiez | Universidad de Atlántico |
| Elian Parlaves S. | Universidad de Atlántico |
| Marely Calvo Venencia | Universidad de Atlántico |
| Pilar Nessuri | Ecomares |
| Roberto Lustra | Universidad de Atlántico |

| | |
|-------------------------------|----------------------|
| Paula Andrea Rojas | MinAmbiente |
| C.N. Andreo Mejia | Armada Colombia |
| Victor Manuel Junca Rodriguez | DAMCRA - MinAmbiente |
| Gustavo Castellanos | WWF Colombia |
| Carlos Andrés Burbano J. | WWF Colombia |