



North Pacific Marine Science Organization
Annual Meeting 2022 - Busan

Science Board Symposium Sustainability of Marine Ecosystems through global
knowledge networks during the UN Decade of Ocean Science

Identifying the Ocean Decade challenges: A common framework for Small Island Developing States

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A CONSERVAR O QUE É NOSSO



Introduction



Small Island Developing State (SIDS)

- ❖ Remoteness: Unique challenges & vulnerabilities
- ❖ Climate Change & Sea level rise
- ❖ Ocean-dependent economy:
 - ❖ e.g. Tourism and fisheries



(UNWTO, 2014)

Introduction



Ocean science & knowledge



Decision-making & policy



Sustainable Development

“The science we need for the ocean we want”



Introduction

10 UNDOSS Challenges



Understand and
beat marine
pollution



Protect and
restore
ecosystems and
biodiversity



Sustainably
feed the global
population



Develop a
sustainable and
equitable ocean
economy



Unlock
ocean-based
solutions to
climate change



Increase
community
resilience to
ocean hazards



Expand the Global
Ocean Observing
System



Create a digital
representation
of the ocean



Deliver data,
knowledge and
technology to all



Change humanity's
relationship with
the ocean

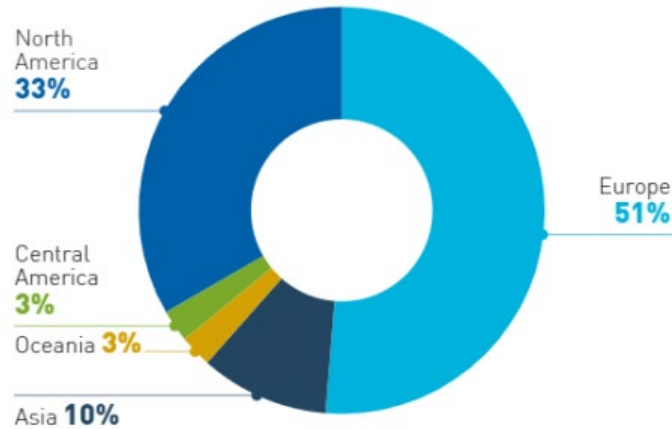
Introduction

Figure 5: Established National Decade Committees.



Introduction

Endorsed Decade Programmes



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NA + EU = 84%

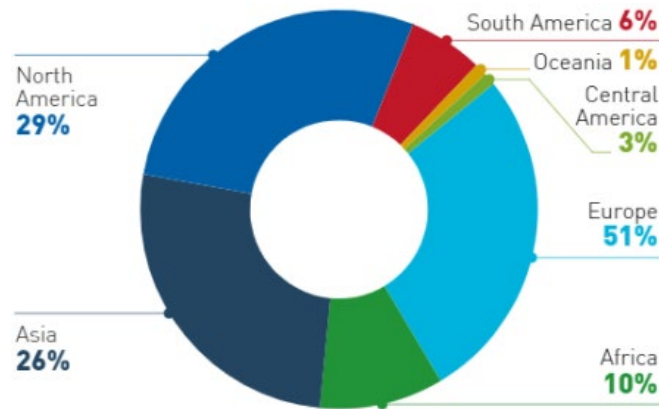
Resource Mobilization



Decade Actions



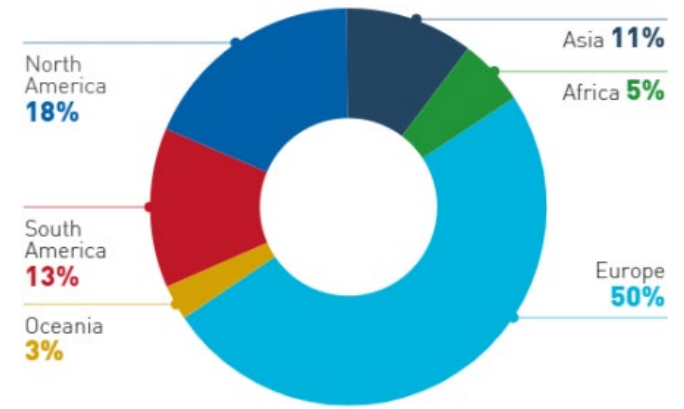
Endorsed Decade Projects



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NA + EU = 80%

Endorsed Decade Activities



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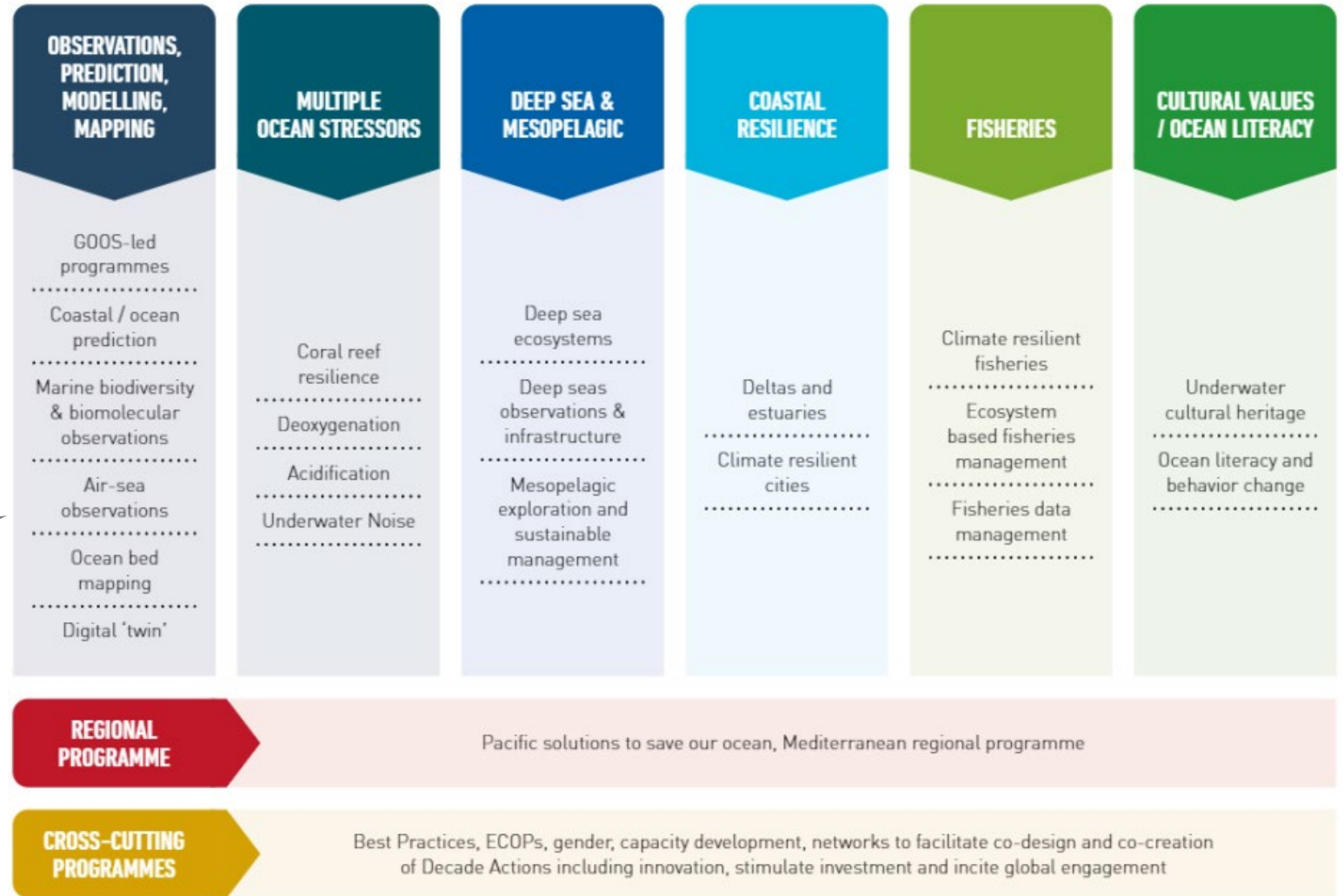
NA + EU = 68%

Introduction

Main themes by endorsed Decade programmes



SIDS specific themes



Objectives

In the context of the model case, Cabo Verde, the objectives are:

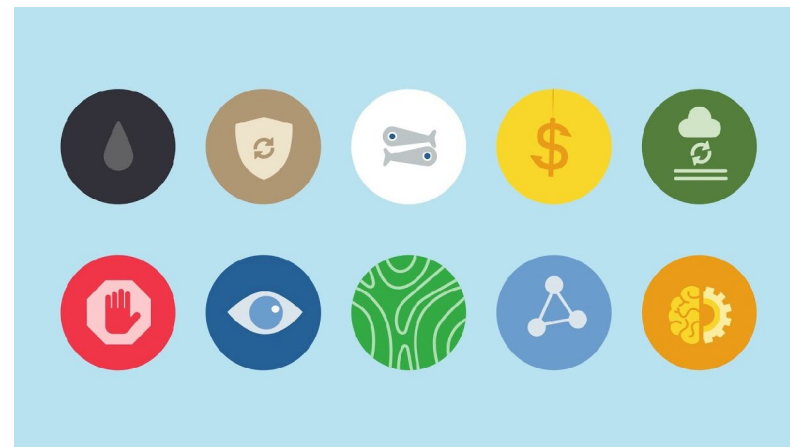
- ❖ To identify the research needs in ocean science for SIDS
- ❖ To analyze the UNDOS challenges for SIDS
- ❖ To contribute to the global knowledge regarding SIDS and UNDOS



Sal

B. Vista

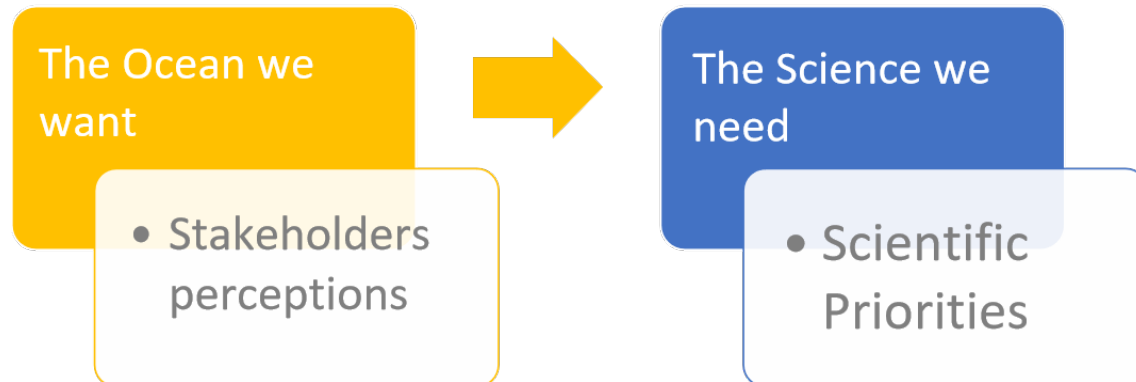
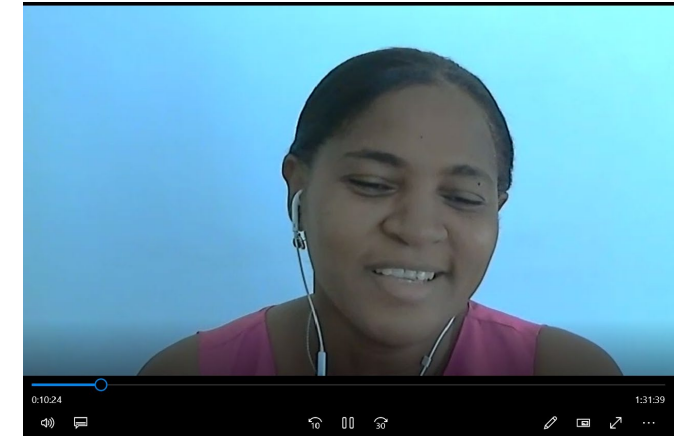
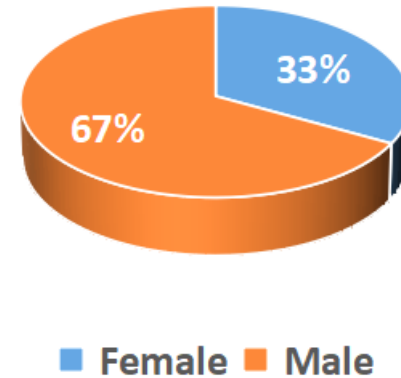
Cabo Verde



Methods

- ❖ 27 Semi-structured interviews
- ❖ Target: local stakeholders
- ❖ Zoom recorded video calls
- ❖ June - August 2021
- ❖ Content Analysis (by Graham Gibbs):
 - NVivo Qualitative Analysis Software

Local Stakeholders



Methods

Stakeholders

- ❖ Researchers & Academics
- ❖ NGO leaders
- ❖ Eco-tourism operators
- ❖ Government officials
- ❖ Environmental activists

Stakeholders' Area of Action



Results

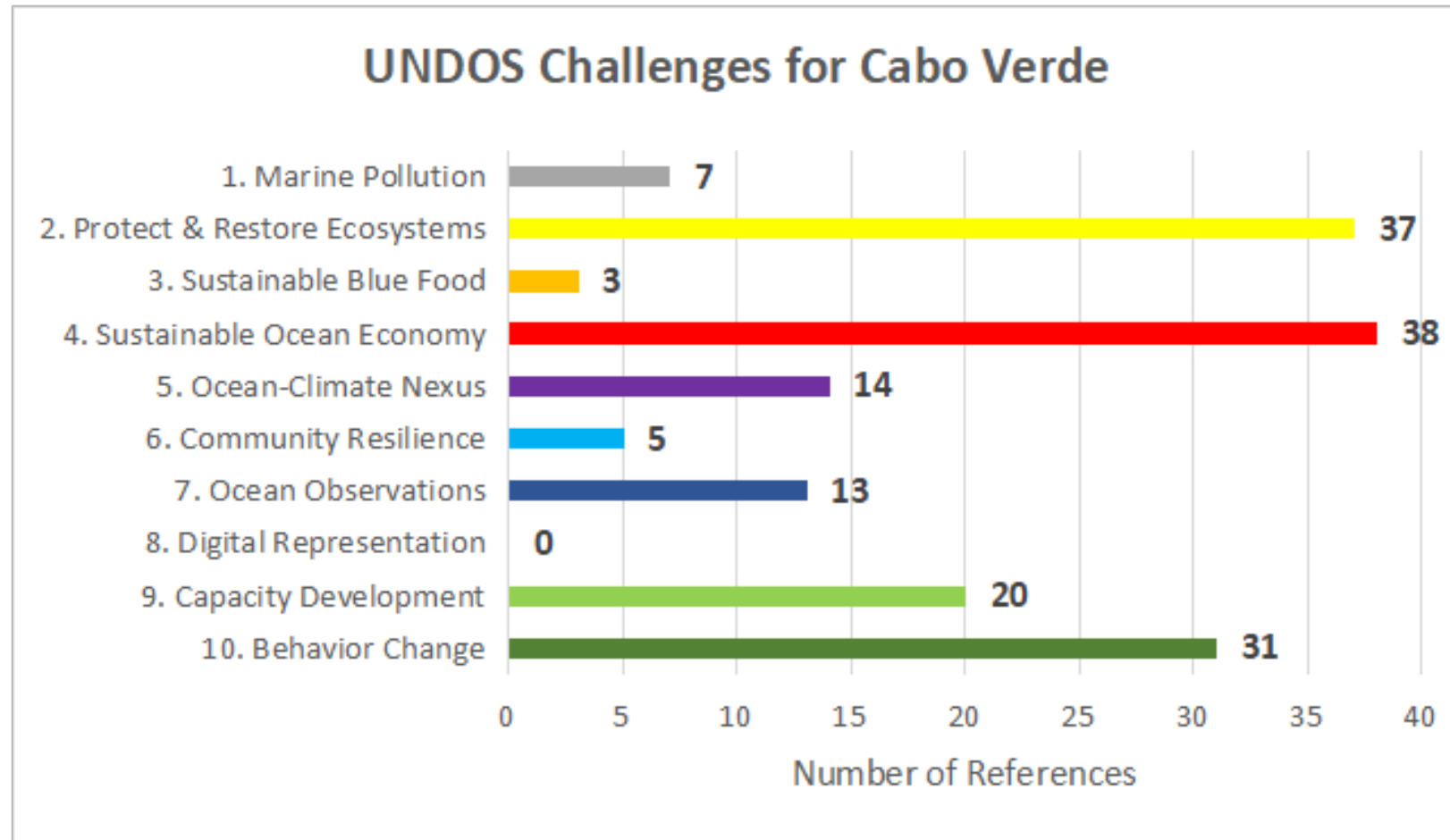


Figure 1. Most referenced UNDOS Challenges for Cabo Verde according to stakeholders' survey.

Results

1. Marine Pollution	Reduce agriculture impacts on marine resources (pesticides run-off, farming waste, contamination of water bodies, etc)																			
	Improve urbanization of coastal cities & waste management- to avoid floods and contamination of ocean, to prevent solid waste going to ocean																			
2. Protect & Restore Ecosystems	Design and implementation of protected areas management plans																			
	Mobilization of funds for conservation & research																			
	Protection of coastal areas (for their cultural, historical and intrinsic value for island nations)																			
	Promote conservation of resources valuable for blue economy																			
	Increase knowledge on coastal, marine resources to better manage																			
	Reduce the urbanization and industrialization (tourism) of coastal areas																			
	Reduce sand extraction																			
	Community engagement in conservation																			
	Alternative livelihoods as a tool for conservation and reducing the pressure on marine environments																			
3. Sustainable Blue Food	Predict food crisis due to climate related changes																			
	Reduce, prevent seafood/fish price inflation																			
4. Sustainable Ocean Economy	Blue tourism income /taxation for the conservation of ecosystems and biodiversity																			
	Blue tourism income /taxation for local sustainable development - blue economy for local sustainable development																			
	Improved Regulation and Consistent Monitoring of Blue Tourism business sector																			
	Gentrification of coastal areas (construction, industrialization) - try to balance gentrification and traditions - balance mass tourism and local tourism - decrease anthropogenic pressure on coastal areas																			
	Increase Blue Exports (fisheries) - increase contribution of Blue business in country's GDP																			
	Fair international trade in fisheries - Review international fishing agreements																			
	Change blue economy - from extractive to productive and transformative																			
	Increase aquaculture and technology production																			
	Diversify the blue economy activities (biotechnology, aquaculture, maritime shipping, etc)																			
	Modernize fishing industry, fleets and system																			
	Create legislation that promotes blue businesses while ensuring conservation of species and habitats																			
5. Ocean-Climate Nexus	Increase climate change adaptation and mitigation research																			
	Prevent or precaution Climate migration (due to sea level rise, desertification, rural exodus, etc)																			
	More studies on climate change effects on changes of species distribution, invasive species, migration, etc																			
	Research on coral reefs and communities - as indicators of climate change																			
	Prevention of coastal erosion, floods, and tropical storms - natural disasters prevention																			
	Increase research on agriculture and farming - to fight period of droughts (most fishermen are also farmers)																			
	Climate change - sea level rise - droughts -agriculture - coastal erosion - sand extraction - saline intrusion																			
6. Community Resilience	Creation of alternative livelihoods																			
	Promote sustainable development of coastal communities																			
	Fair international trade in fisheries (increase local transformation of products, fair value trade, etc)																			
	Supply chain (more steps done in the community)																			
	Community participation in decision-making processes/management and business investments																			
7. Ocean Observations	Increase scientific knowledge of local marine resources (identification of new species, censos)																			
8. Digital Representation																				
9. Capacity Development	National Scientific Committee for target species (e.g. seaturtles)																			
	More local science production - know more to better protect and use - capacitate local researchers																			
	Promote transdisciplinarity and multidisciplinary approaches to science/to research done locally																			
	Data sharing and availability																			
	Have more capacitated and specialized researchers (for SIDS context) - more marine-specialized research																			
	Capacitate and train local fishermen (security, using fishing tools, knowledge, adapting fishing skills, ect)																			
10. Behavior Change	Raise awareness within local population and decision-makers																			
	Increase government concern over environmental issues (more practical approach implement more) - increase government funds on research																			
	Targeted environmental education (in schools, as part of the educational program)																			
	Promote positive relationship with the ocean - beyond the economic value																			
	Enforce, review and monitor marine legislation (by government)																			
	Universities should change approach to research, invest more in marine science																			
	more governance of natural resources																			
	NGOs and government working closer with communities (e.g. case of boa vista)																			
	Change the language of communication of ocean science																			

Table 1. Identified and detailed Cabo Verde UNDOS Challenges, according to local stakeholders.

Results

2. Protect & Restore Ecosystems	Design and implementation of protected areas management plans				
	Mobilization of funds for conservation & research				
	Protection of coastal areas (for their cultural, historical and intrinsic value for island nations)				
	Promote conservation of resources valuable for blue economy				
	Increase knowledge on coastal, marine resources to better manage				
	Reduce the urbanization and industrialization (tourism) of coastal areas				
	Reduce sand extraction				
	Community engagement in conservation				
	Alternative livelihoods as a tool for conservation and reducing the pressure on marine environments				

Table 1. Identified and detailed Cabo Verde UNDOS Challenges, according to local stakeholders (modified)

1. Marine Pollution

Local Challenge: Reduce agriculture impacts on marine resources (pesticides run-offs, farming waste, contamination of water bodies, etc)

*Fisheries and agriculture
are practiced near the
coast... From the land to
the sea we have pesticides,
solid waste...*

Academic & Researcher



Santa Luzia Natural Reserve, Cabo Verde

tararecuperavel.org 

2. Protect & Restore Ecosystems

Local Challenge: Alternative livelihoods and socio-economic development as a tool for conservation - reducing the pressure on marine resources



 Cabo Verde Natura 2000

If we want to protect biodiversity we have to take into account the social or economic aspects...

Academic & Researcher

- Minimum wage - approx 120 USD/month
- Eco-tourism
- Mainly extractive activities
- The case of sand extraction


2. Protect & Restore Ecosystems



3. Sustainable Blue Food

Local Challenge: Seafood price control: affordable to locals & fair trade



 Admirio Inocência

Tuna, which used to cost 150 CVE/kg on the market, today is costing 350 CVE/kg. Then you go to supermarkets in Portugal, and you can find the Cabo Verde Tuna for less than 1 euro.

Academic & Researcher

Executive Plan for Fisheries Resource Management:

- ❖ Maximize economic and social returns
- ❖ Safeguard the sustainable management of fisheries


4. Sustainable Ocean Economy

Local Challenge: Diversify blue economy activities (biotechnology, aquaculture, maritime shipping, etc) & Promote local micro-economic development

We are training communities so they are able to develop these activities, giving them economic support to create their companies: Not only related to fishing, but also related to enhancement and processing of the fishing products and diversification of activities.

NGO member




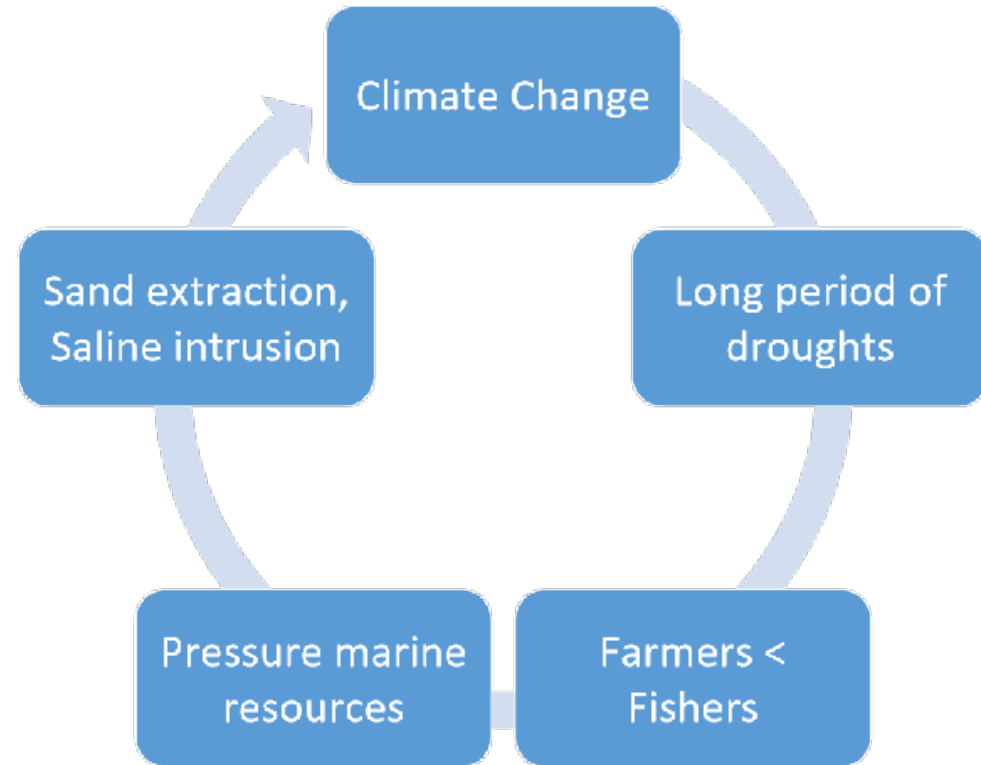
Carla Macedo 

5. Ocean-Climate Nexus

Local Challenge: Invest in transdisciplinary research: SEES Concept of Future Program; Agriculture, Fisheries, Sociology and others areas are impacted by Climate



 José Soriano



6. Community resilience

Local Challenge: Community participation in decision-making processes, management and business investments



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Greater participation and involvement of communities. Public participation, not only to give opinions but also executive participation in decision-making processes... Development of actions that promote local development

Academic & Researcher

7. Ocean Observations

Local Challenge: Increase scientific knowledge of local marine resources (identification of new species, censos, monitoring, etc)

Firstly, developing work and encouraging the production of scientific research. To protect and conserve what we have, we must know what we have in order to do conservation and have a rational use of these resources.

Government Official



Naya Sena 

9. Capacity Development

Local Challenge: Training and specialized capacitation of fishers, activists and local researchers.

We work with the guardians of the sea, and they are much more aware of resources and how to protect resources.

NGO member

Our fishermen have been fishing for two hundred years... and they are still using the same gear that their grandparents used, they don't know how to use technology (e.g. GPS)...

Researcher & Academic




 Maio Biodiversity Foundation

10. Behaviour Change

Local Challenge: Change of Behaviour in different groups of stakeholders:

- Government - more concern on environmental issues
- Academia - invest in marine science
- NGO - promote environmental education
- Scientists - simply and amplify scientific communication



 Projecto Vito

We need to invest in education, we need people to be more aware of their roles in protecting our seas. We have always seen the sea as an immense thing, where we can take what we want because it never ends, but it ends...

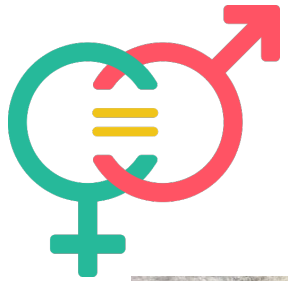
Environmental Activist

Discussion & Conclusions

- ❖ First assesment of UNDOS Challenges based on SIDS stakeholders' perceptions
- ❖ Top Challenges: Sustainable Blue Economy, Protect Ecosystems & Behaviour Change
- ❖ Challenge 8 - Digital Representation: not a real priority? Or lack of knowledge?
- ❖ SIDS context: marine & terrestrial enviroments are closely & particularly linked
- ❖ Reducing the pressure on SIDS marine and coastal resources seems to be the BIG CHALLENGE
- ❖ Local stakeholders should be involved in determining the “Ocean we want, so we can make the Science that we ALL need”

Discussion & Conclusions

The gender lens



Future Actions

- ❑ Similar assessments are necessary on other SIDS
- ❑ Increased UNDOS Programmes, Projects and Activities in SIDS is needed
- ❑ SIDS targeted Call for Actions ? - targeted funding
- ❑ Promotion Co-design: PICES and UNDOS how can we collaborate with

SIDS?

