Oceans Accounts Unpacked

Oceans Economies, Blue Economies and Ocean Accounting for Ocean Governance

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Oceans Accounts Unpacked

Firstly a word of introduction – I am Ken Findlay, the incumbent CPUT Research Chair; Oceans economy, Cape Peninsula University of Technology, Cape Town, South Africa. I have a very strong interest in ocean accounting and its positioning in ocean policy development and ocean governance. I drive a number of different Communities of Practice / Working Groups on Ocean Accounts in Africa – Members of which are present in today's workshop.

This workshop will be recorded. If there are any participants who wish not to be recorded, I ask that they leave and arrange an alternate non-recorded presentation of this workshop content.

I will chair the workshop. Please remain muted unless taking the floor through the Chair. The same for video to remain switched off unless speaking from the floor. Please utilise the chat screen or raised hand for questions.

Dr Taina Loureiro will moderate the "raised hand" and the chat panel for questions. Please feel free to ask questions as we proceed. Questions will be addressed at the end of any slide. The aim of the workshop is to allow for dialogue and to advance an awareness of ocean accounts. Periodically the Chair may ask for comments or input.

Participants in the workshop come from a diverse background of economic, social and environmental / ecological sciences and or management or from other diverse areas such as media. The fundamental aim of the workshop is to introduce ocean accounting and the associated frameworks at a basic level for the understanding of all. Links between the introduced domains are important. Please bear with us if your particular field of speciality is addressed simplistically. Greater detail can be provided in subsequent workshops.

BACKGROUND - WHAT IS AN ACCOUNT?

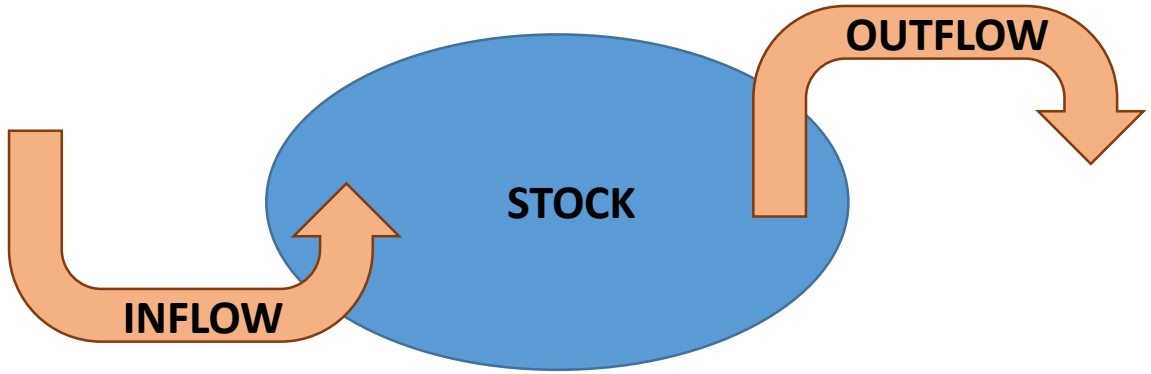
Accounts measure quantities but need to distinguish between quantities that are stocks and those that are flows.

A *stock* is measured at a specific time, and represents a quantity existing at that point in time (e.g. a fish stock).

A *flow* variable is measured over an interval of time (e.g. an annual fish catch).

A stock (or "level variable") is some entity that is accumulated over time by inflows and/or depleted by outflows. Stocks can only be changed via inflows (adding to the stock) and outflows (subtracting from the stock).

An account measures a particular entity over a set period of time in **consistent and standardised manners** so as to allow temporal and spatial comparability.



BACKGROUND - WHAT IS AN ACCOUNT?

Entity / Unit		Bank Account	Fish Stock	Minerals Stock
			Renewable	Non-Renewable
Date	Opening Stock	Opening Balance	Initial Fish Stock	Initial Ore Reserve
Date	Inflow	Deposit	Recruitment	Null
Date	Positive growth	Interest gain	Growth	Null
Date	Use Outflow	Withdrawal	Fishing Mortality / Catch	Ore Extraction
Date	Natural Outflow	Account Charges	Natural Mortality	Null
Date	Impact Outflow	Theft	Impact	Impact
Date	Closing Stock	Closing Balance	Final Fish Stock	Final Ore Reserve
		Monetary	Physical / Monetary	Physical / Monetary

Stocks and Flows can be Economic, Social or Environmental and be Physical or Monetary

BACKGROUND - WHAT ARE NATIONAL ACCOUNTS?

National accounts are a coherent, consistent and integrated set of accounts, balance sheets and tables based on a set of internationally agreed concepts, definitions, classifications and accounting rules. They provide a comprehensive accounting framework in a format that is designed for purposes of analysis, decision-taking and policy-making. They are compiled for a succession of time periods, providing a continuing flow of information for monitoring, analysis and evaluation of performance.

1. Economic account systems (e.g. the SNA, 2008) provide information on
    a) economic activities,
    b) the levels of an economy's productive assets and the wealth of its inhabitants at particular points of time, and
    c) the links between an economy and the rest of the world.
2. Environmental – economic account systems (e.g. the SEEA – CF, 2012; SEEA – EEA, 2013; SEEA - EA, 2021) extend the economic accounts to
    d) the environment,
    e) natural capital
    f) the underpinning ecosystems (type, extent and condition) and ecosystem services and abiotic services;
3. Social accounting systems (e.g. SAMs) provide information on the distribution of economic opportunities.

Flows link systems into an accounts framework – Ocean Accounts are such a framework

1. The ocean plays a major role in the provision of goods and services to people (as Natural Capital)

2. There are global increases in Ocean Economies and Blue Economies* as nations or regions turn to new opportunities to foster economic growth and ensure food and energy security

3. Subtle Difference between an Ocean Economy and a Blue Economy / SIOE

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WHAT IS AN OCEAN ECONOMY?

An ocean economy refers to economic sectors and the economic activities that are carried out on, in or under the ocean, linked to the ocean or dependent on the ocean (and to some extent adjoining coastal areas) (based on Park & Kildow, 2014; OECD, 2016).

Oceans economies relate to ocean resource production or mobilization – Means to maximise *production* of current *consumable (intermediate, final, accumulation, export)* output, business transactions, income and employment opportunities dependent on or linked to marine systems.

Ocean economy valuations are often required for ocean governance (for example, in trade-offs). These are :

- Largely undertaken as gross value add of market value **ocean contribution to GDP** by Sector or Value Chain.
- Important metric for strategic macroeconomic planning, investment decisions, measures of economic growth.

WHAT IS AN OCEAN ECONOMY?

OCEAN MARKET CONTRIBUTION TO NATIONAL ACCOUNTS (VALUE CHAIN APPROACH ACROSS SECTORS)

1. Economic activities that take place at, on or under the sea

1A. Consumptive Use of Living Resources
e.g. fisheries

1B. Non-consumptive Use of Living Resources
e.g. scuba tourism

1C. Use of Non-living Resources
e.g. mining, offshore oil and gas

1D. Dependent on Ocean Space / Ocean Environment
e.g. shipping

2. Economic Activities elsewhere but dependent on sea or linked to sea

e.g. Shipbuilding, Maintenance and Repair
Maritime equipment provision and repair
Coastal tourism, Recreational activities and leisure
Commercial Maritime Services (consulting services, maritime finance and insurance, trade activities, information services).

3. Non-Commercial Maritime services

Education, training and RTI

Ocean governance activities

Defence and maritime security

Marine protection services

Maritime information and communication services

Safety and Remediation

4. Indirect Contribution

e.g. aesthetics and property prices

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HOW TO MEASURE AN OCEAN ECONOMY?

The values of ocean economies have largely been estimated as the contribution of ocean economic sectors to GDP through gross value add along value chains.

This process requires :

1. Choice of sectors to include / exclude - ISIC five digit codes
2. Disaggregation of the values of the ocean contribution

The individual categories of ISIC have been aggregated into the following 21 sections:

Section	Divisions	Description
A	01–03	Agriculture, forestry and fishing
B	05–09	Mining and quarrying
C	10–33	Manufacturing
D	35	Electricity, gas, steam and air conditioning supply
E	36–39	Water supply; sewerage, waste management and remediation activities
F	41–43	Construction
G	45–47	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	49–53	Transportation and storage
I	55–56	Accommodation and food service activities
J	58–63	Information and communication
K	64–66	Financial and insurance activities
L	68	Real estate activities
M	69–75	Professional, scientific and technical activities
N	77–82	Administrative and support service activities
O	84	Public administration and defence; compulsory social security
P	85	Education
Q	86–88	Human health and social work activities
R	90–93	Arts, entertainment and recreation
S	94–96	Other service activities
T	97–98	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
U	99	Activities of extraterritorial organizations and bodies

Challenges

1. Seldom standardised metrics across nations or regions
2. No accounting of Natural Capital Assets and Sustainability
3. No accounting of Inclusivity
4. Monetarised and market values only

Serious flaws in this approach with respect to **inclusivity, sustainability**, sectoral inclusion, information disaggregation and monetarised approaches.

WHAT IS A BLUE ECONOMY?

Acknowledge that the term "Blue Economy" is used in a number of ways:

1. As used by the Small Island Developing States in the lead up to the Rio+20 UNSD conference (with their large EEZs) as a parallel to a green economy concept to include pillars of sustainability and inclusivity,
2. As used by Pauli (2010) to describe business models that prioritize local economies, using innovation to pursue production efficiency using renewable resources
3. In more limited cases in a somewhat "greenwashing" approach to describe ocean economies.

Not to be confused with blue ocean / red ocean business strategies of Kim and Mauborgne (2017)

Here we use Blue economy as in 1 – a sustainable and inclusive ocean economy (SIOE).

WHAT IS A BLUE ECONOMY?

Blue Economy - Three central pillars

1. **As per Ocean Economy - Resource production or mobilization** Maximise production of current consumable output, business transactions and employment in marine systems / Means of producing and mobilising for current consumption and jobs / *Production of opportunities today.*
2. **Well-being and distribution of income.** Share the proceeds of production in an equitable way as produced means are converted into outcomes and improvements in well-being for people / Providing and equitably distributing real income / *Distribution of opportunities today.*
3. **Future opportunities for use of / sustainability of ocean wealth.** Protecting systems and opportunities for future generations / Conserve marine ecosystems and processes / *Allocating opportunities between today and tomorrow.*

After Fenichel et al., 2020

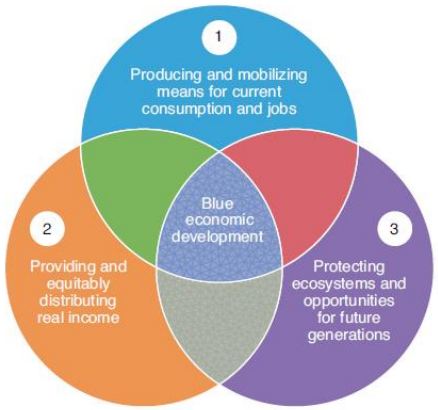

Fig. 1 | The three objectives of blue economic development. Sustainable development at a minimum requires balance of three spheres of interest; production of opportunities today, distribution of those opportunities today, and allocating opportunities between today and tomorrow. Sustainable development is the intersection and balancing of these three areas of concern.

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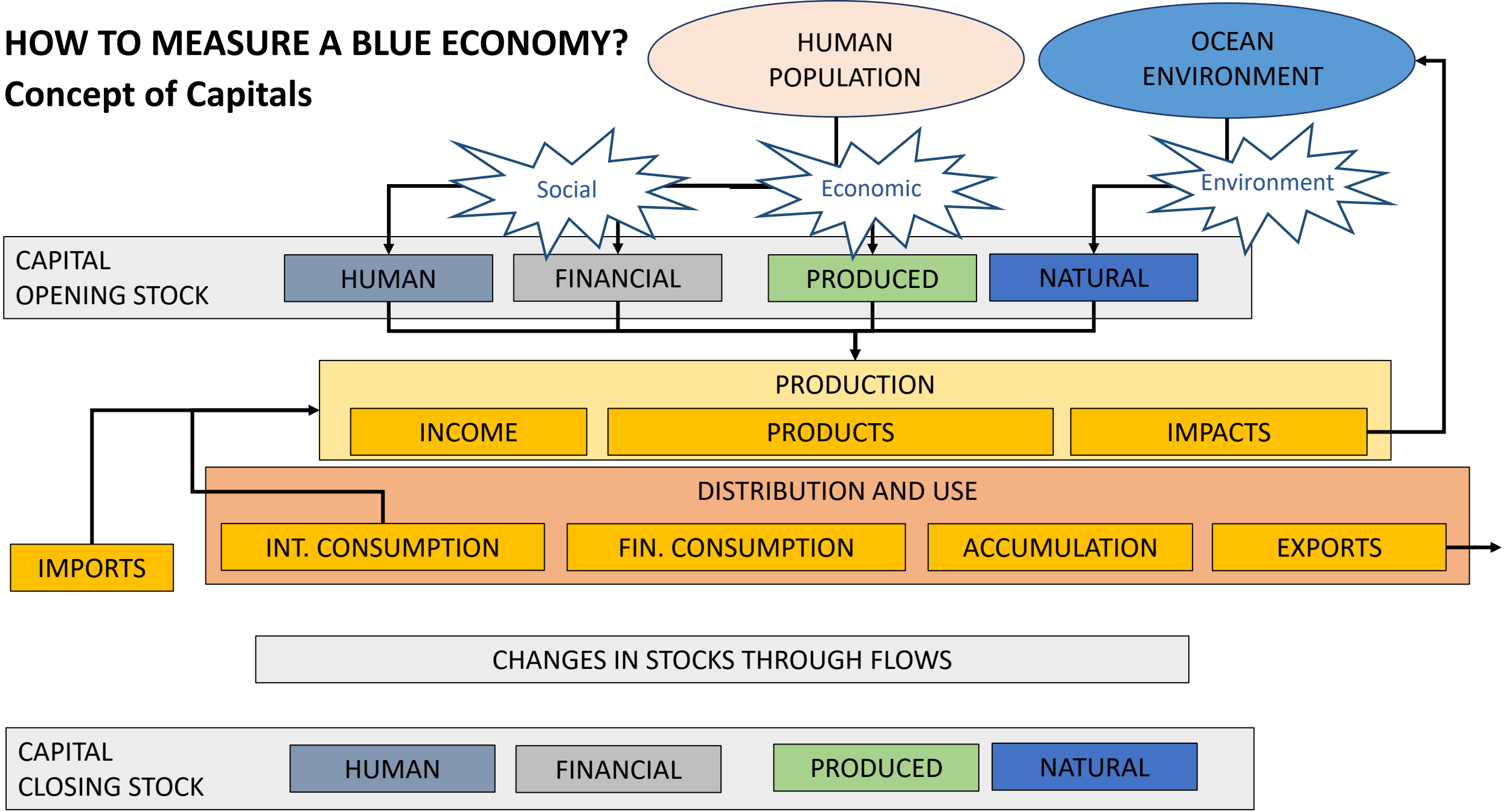
HOW DO WE VALUE A BLUE ECONOMY?

HOW TO MEASURE A BLUE ECONOMY?

Concept of Capitals

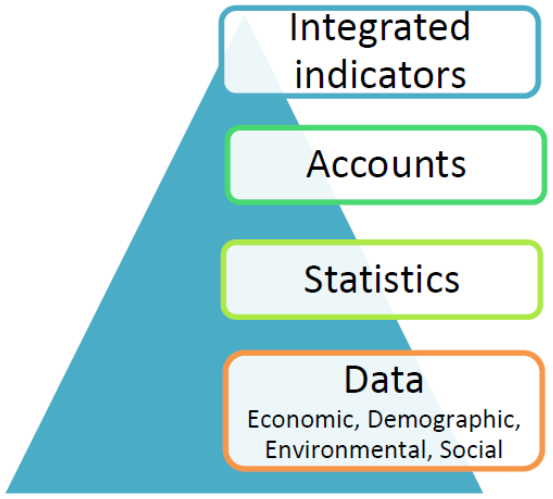


WHAT ARE OCEANS ACCOUNTS ?

Oceans accounting is a novel approach of integrating records of economic activities, social conditions, and environmental characteristics relating to ocean, ocean resource-uses and the marine and maritime domains on a regular basis using international statistical standards

A framework of oceans accounts is a complex framework of systems including economic, social and environmental components that allow stocks within systems and flows between systems (segues) to be identified.

They facilitate and allow for comparability across spatial and temporal domains – particular value as indicators.



The objective is not to obtain an estimation of the absolute value of an ocean space, - an exercise in the estimation of infinity (Fenichel et al 2020).

However standardised estimation of relative metrics allows for temporal comparisons in terms of trend data.

They facilitate and allow for standardised comparability across spatial and temporal domains – particular value as indicators.

HOW DO WE USE OCEAN ACCOUNTS TO INTEGRATE DATA FROM ACROSS THE ENVIRONMENTAL, SOCIAL AND ECONOMIC DOMAINS IN CONSISTENT, STANDARDISED AND COMPARABLE MANNERS?

THIS IS THE SAME QUESTION AS EARLIER – HOW DO WE VALUE A BLUE ECONOMY?

BREAK - DISCUSSION

GOAP & OCEAN ACCOUNTING

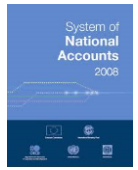
The Global Ocean Accounts Partnership (www.oceanaccounts.org) aims to measure and manage progress towards sustainable ocean development, through the inclusion of **environmental, social and economic domain metrics** in the estimation of holistic measures of the contribution of oceans to societal well-being.

Oceans Accounting advances **standardised consistent frameworks** to include metrics from across these three domains using both accepted and novel accounting frameworks.

- **Ocean Economy Satellite Accounts** within the **System of National Accounts** allow for the economic contribution of ocean sectors to be measured.
- Ecosystem and abiotic flows of natural capital to the **SEEA – Central Framework** (which incorporates both the flows to economic sectors and impact flows from sectors to the environment).
- The spatial **System of Environmental Economic Accounting (SEEA) Ecosystem Accounting (EEA)** frameworks includes assessments of ecosystem asset condition and extents, and identification of ecosystem service and abiotic service assets.
- The Framework also introduces **guidance on novel accounting of ocean risk; access and inclusivity in terms of ocean use, benefits and costs; and ocean governance**

First Global Dialogue on Ocean Accounting
12–15 November 2019
Sydney, Australia

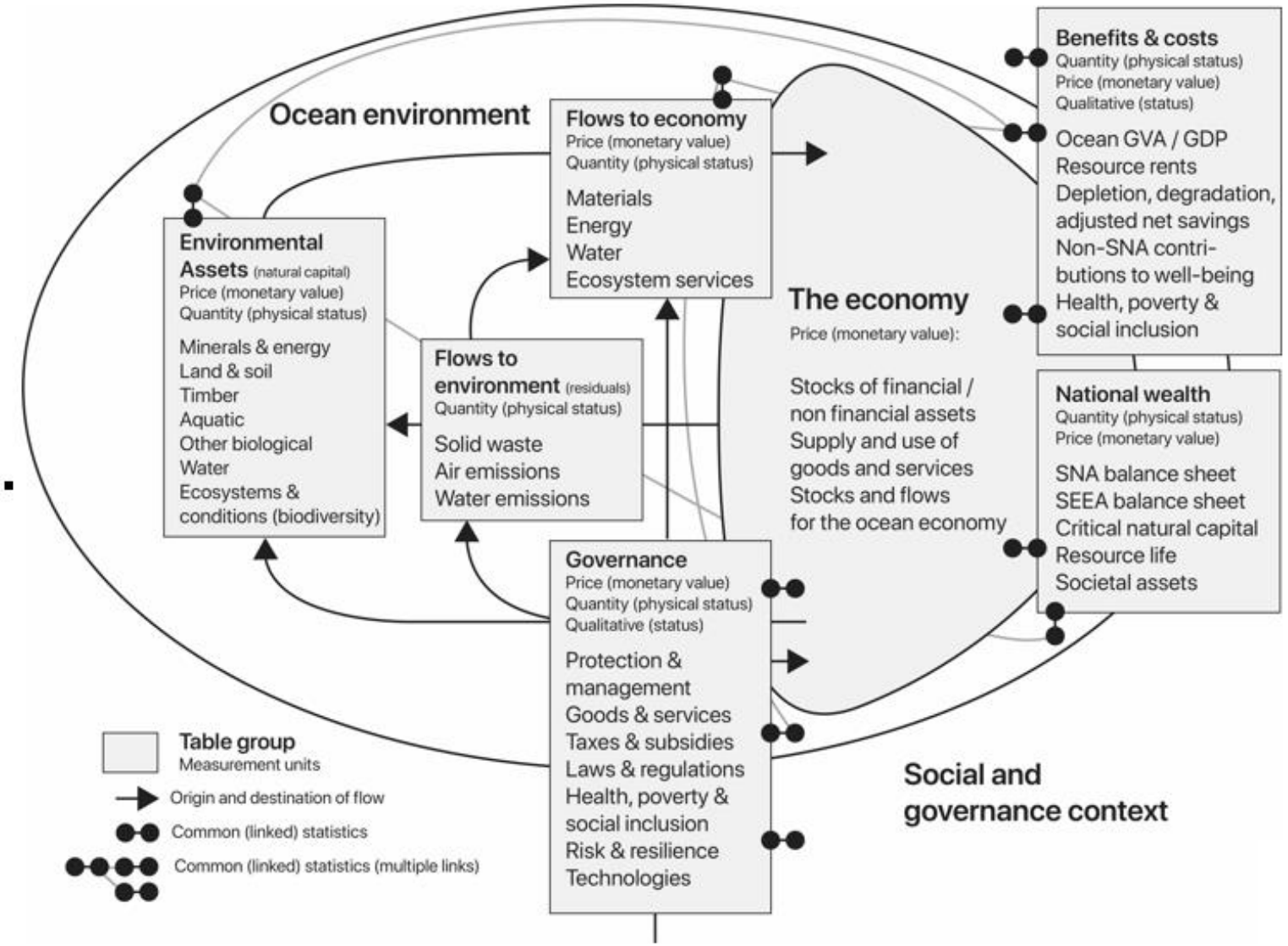
Second Global Dialogue on Ocean Accounting
20 April 2021
Virtual Meeting



Global Ocean Accounts Partnership

Technical Guidance on Ocean Accounting for Sustainable Development

Global Ocean Accounts Partnership



Governance Accounting Framework

Risk Accounting Framework

RISK ACCOUNTS

OCEAN RISK

DISASTER & NATURAL RISK

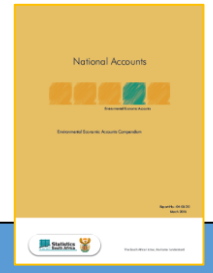
GOVERNANCE ACCOUNTS

ANTHROPOGENIC RISK

Unsustainable Extraction, Pollution, Habitat Modification, Climate Change, Invasive Translocations

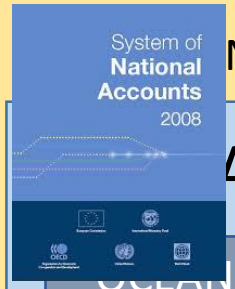
2. MARINE ECOSYSTEM ACCOU
(Spatially based)

Ecosystem typologies and inven
Ecosystem extent
Ecosystem condition
Ecosystem services
Environmental assets



3. ABIOTIC GOODS AND SERVICES

BLUE ECONOMY / SIOE



NAL ACCOUNTS (GDP)

ANS ECONOMY

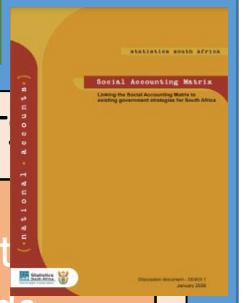
OCEAN SATELLITE ACCOUNTS
=
Ocean Contribution to National Accounts (GDP) By Sector

NMENTAL ECONOMIC ACCOUNTS

Natural Capital
ows from
environment to economy

Residual and impact flows from economic sectors to ocean environment

SOCIAL ACCOUNT



Social Accounting Mat
Distribution of Ends

Employment (FTE, Indirect, Induced)

Gender Equity

Traditional Economies

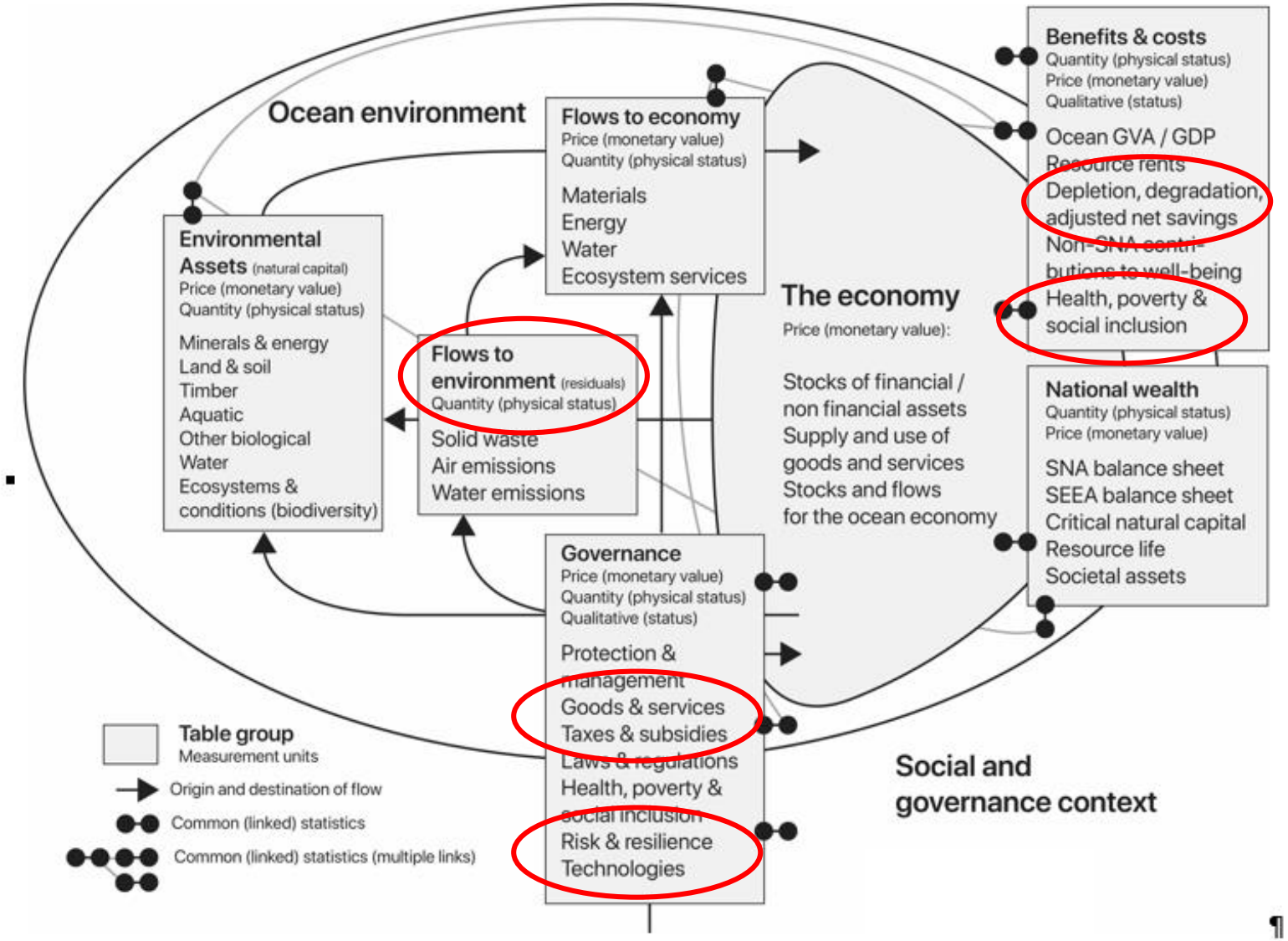
MAIN DIFFERENCES RELATE TO

THE POSITIONING OF NOVEL RISK, SOCIAL AND GOVERNANCE ACCOUNTS AS SEPARATE ACCOUNTS

THE POSITIONING OF RISK ACCOUNTS TO INCLUDE A GREATER COMPONENT OF ANTHROPOGENIC RISK FLOWS ACROSS DOMAINS

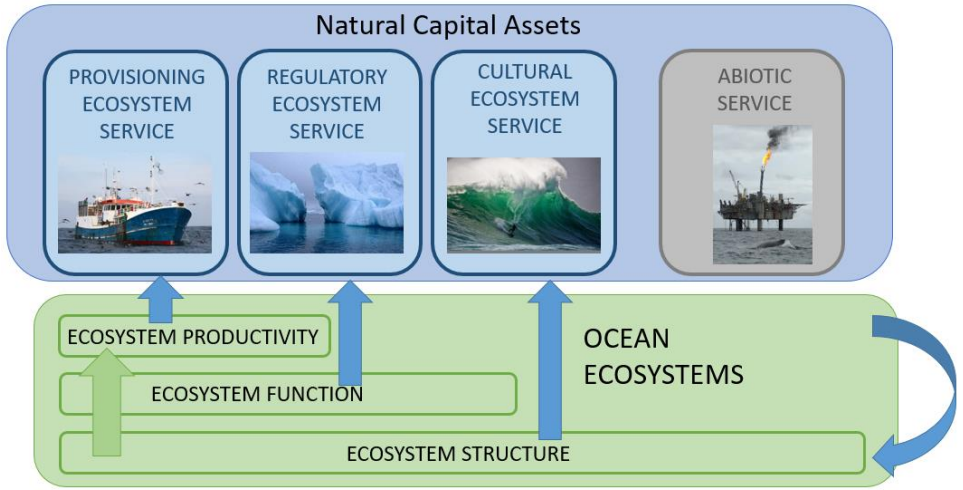
STOCKS AND FLOWS MAY BE QUALITATIVE OR QUANTITATIVE AND BOTH PHYSICAL AND OR MONETARY.

Global Ocean Accounts Partnership



BREAK - DISCUSSION

MARINE ECOSYSTEM ACCOUNTS



MOVING FROM SPATIAL

MARINE ECOSYSTEM ACCOUNTS
Ecosystem Types (GET based)
Ecosystem Extent (ha)
Ecosystem Condition (IUCN Red List)
Provisioning Ecosystem Services
Environmental Asset Supply (P / M)

ABIOTIC GOODS AND SERVICES

Cultural Ecosystem Services
Regulatory Ecosystem Services

Natural Capital

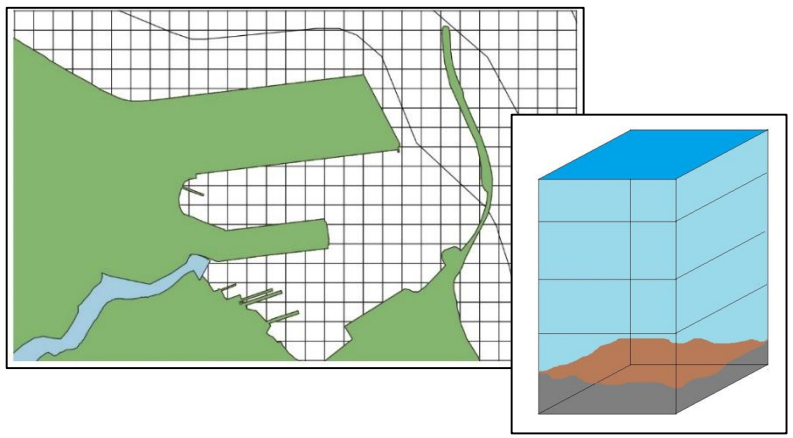
TO SECTORAL

ENVIRONMENTAL ECONOMIC ACCOUNTS BY OCEAN SECTOR
Provisioning Ecosystem Services
Environmental Asset Stocks
Environmental Asset Supply (P)
Environmental Asset Supply (M)

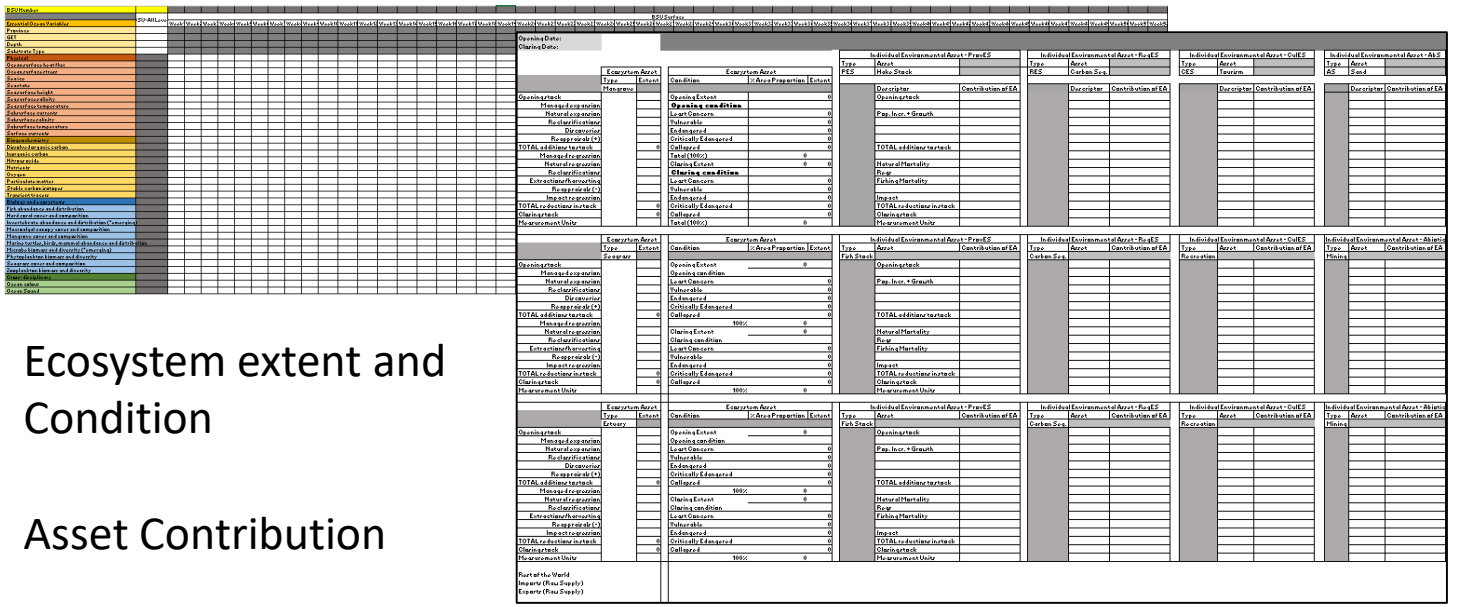
RISK

RISK ACCOUNTS
Natural Risk
Anthropogenic Risk

Essential Ocean Variables (EOV)
Empirically Derived Typologies in 3D

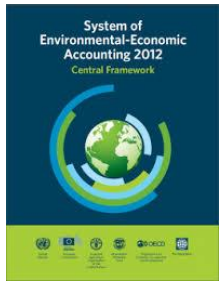


Data Input (EOVs)



Ecosystem extent and Condition

Asset Contribution



SEEA ENVIRONMENTAL ECONOMIC ACCOUNTS – CENTRAL FRAMEWORK

ENVIRONMENTAL

MOVING FROM SPATIAL

ENVIRONMENTAL ECONOMIC ACCOUNTS BY OCEAN SECTOR
Provisioning Ecosystem Services or Abiotic Services
Environmental Asset Stocks
Environmental Asset Supply (P)
Environmental Asset Supply (M)

ECONOMIC

TO SECTORAL

ANTHROPOGENIC IMPACT RISK ACCOUNTS
Unsustainable Extraction, Pollution, Habitat Modification, Climate Change, Invasive Translocations

Cost of Environmental Management

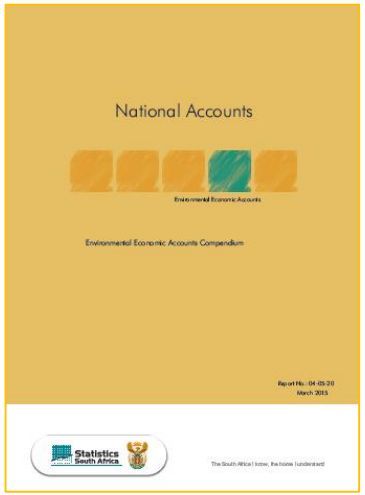
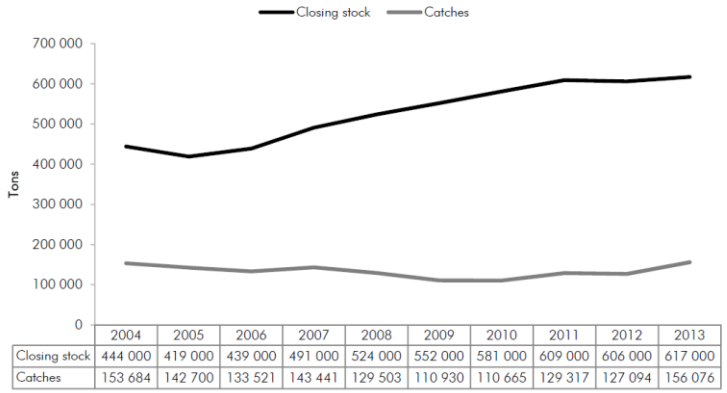


Figure 3.2.1: Hake closing stock and total catches, 2004–2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Closing stock	444 000	419 000	439 000	491 000	524 000	552 000	581 000	609 000	606 000	617 000
Catches	153 684	142 700	133 521	143 441	129 503	110 930	110 665	129 317	127 094	156 076

Source: Statistics South Africa. Environmental Economic Accounts Tables.

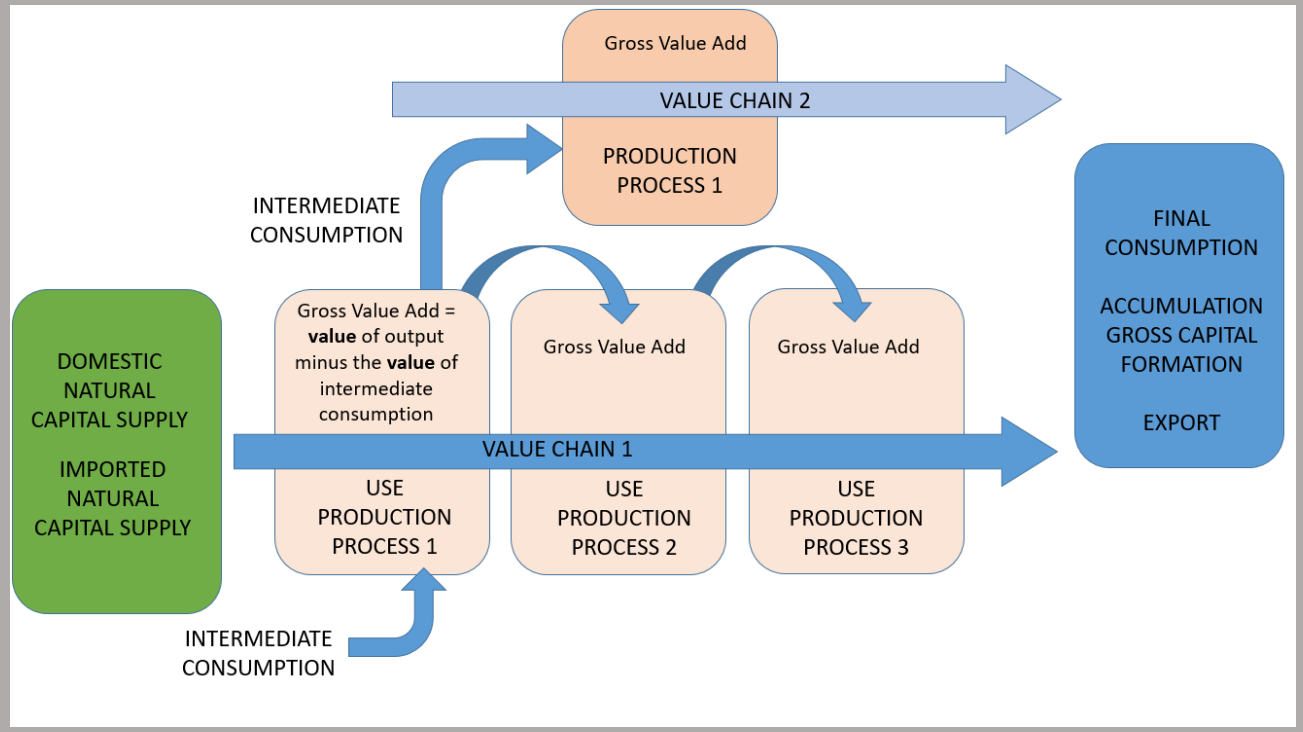
OCEAN ECONOMY SATELLITE ACCOUNTS (OESA)

OESA measures economic activity directly dependent on oceans and coasts through ocean resource supply, ocean product development or geographically ocean dependent activities.

Sectors
Construction
Electrical Power Generation / Distribution
Government
Living Resource Use
Minerals Extraction and Production
Research and Education
Professional and Technical Services
Ship and Boat Building
Transport
Tourism and Recreation

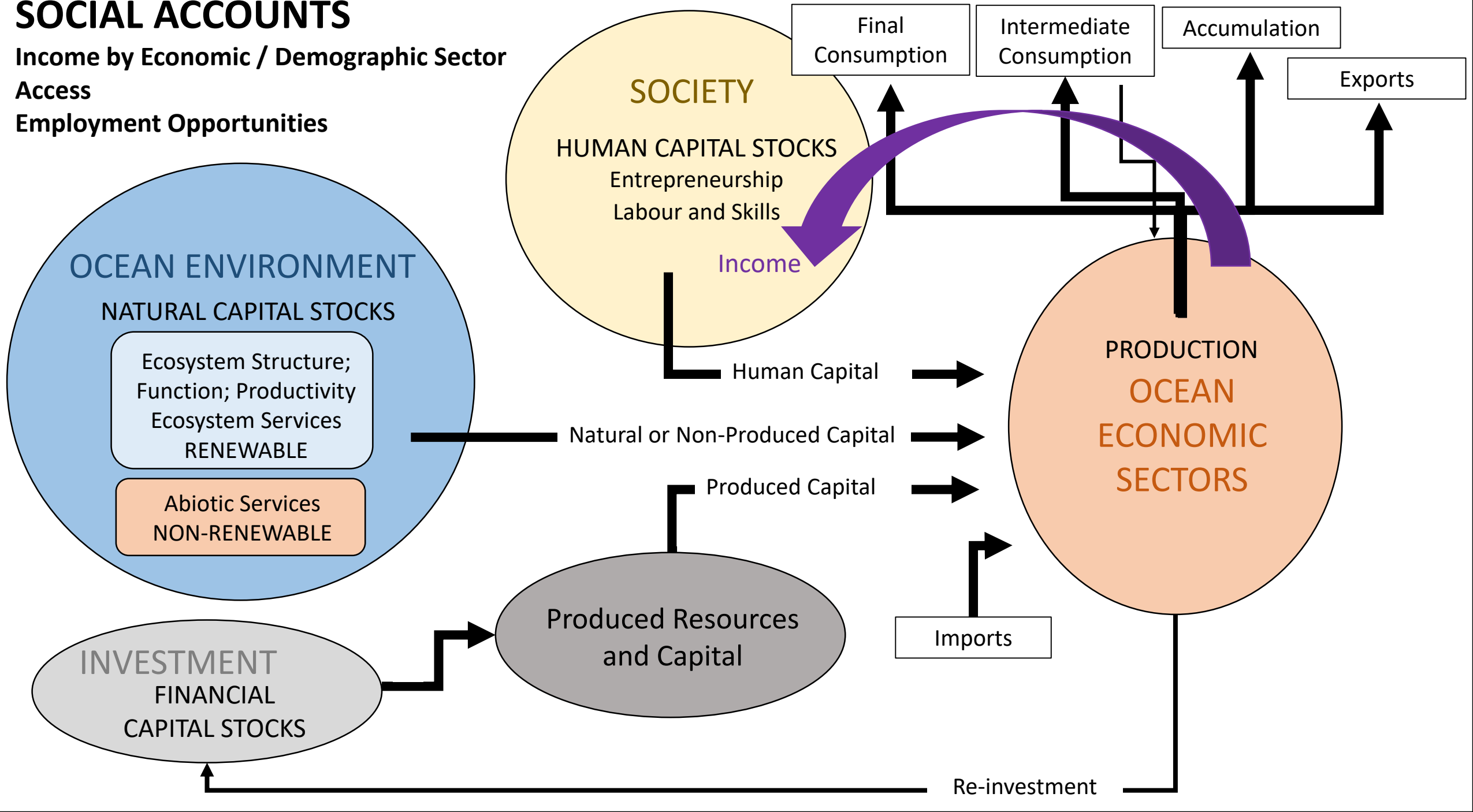
Supply Use Tables
Input- Output Tables

Measurement of GVA - **value** of output minus the **value** of intermediate consumption



SOCIAL ACCOUNTS

Income by Economic / Demographic Sector
Access
Employment Opportunities



GOVERNANCE ACCOUNTS

1. Some components captured through SEEA – Central Framework – Environmental Accounts Cost and Benefit of Education, training and RTI; Ocean governance activities; Defence and maritime security (MDA); Marine protection services; Maritime information and communication services; Safety and Remediation Services.
2. Availability of Regulatory Instruments in Relation to Sectoral Risk Management and Mitigation.
3. National Achievements of Commitments (Indicators).
4. Authoritative or Corporate Governance (HSE programmes) by Sector.

Actors in Ocean or Blue Economies
Normative frameworks of treaties, laws, regulation, policies
Behavioural Relationships – Vertical & Horizontal
Spatial Boundaries at different spatial scales - local, national, regional and international / transboundary / ABNJ.

Policy Risks with respect to rights exclusivity and limitations (Milligan and O'Keefe, 2019)

BREAK - DISCUSSION

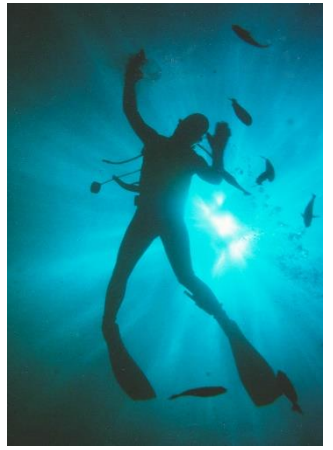
CONTEXT OF OCEAN CHANGE

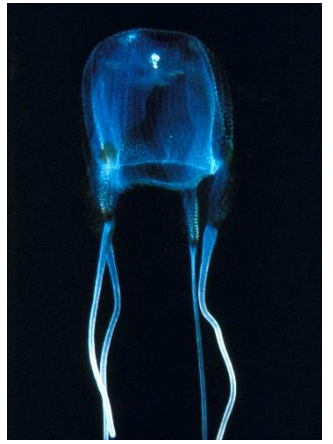
Oceans are changing due to global challenges and changes in Earth systems, for example climate change, ecosystem degradation and biodiversity loss.

Human use of the ocean's resources are changing both as a result of such ocean systems changes and new technologies extending production boundaries in the ocean realm, for example the expansions of oceans economies across the globe.

Such new technologies are also **changing the way we conduct ocean sciences** with Fourth Industrial Revolution technologies advancing ocean data collection methods through for example, robotics, remote sensing, big data analytics and machine learning.

Ocean Governance models need to account for and incorporate such changes, particularly in the context of arising conflicts from expanding oceans economies.





Ocean Governance -

"the coordination of various uses of the ocean in conjunction with the protection of the marine environment" *Pyc (2016)*

"the foundation of rules, institutions, processes, agreements and arrangements based on which economic activities are undertaken" *World Ocean Council (2018)*

Governance of ocean resource use / human economies and the impacts thereof
Ocean governance can be seen as a process and as a product

The processes of informed decision-making carried out by a wide variety of actors and institutions (individuals; households; communities; government authorities; corporate entities) incorporating norms, agreements, rules and regulatory instruments (as products) to organise the way in which humans manage their use of the ocean and its resources.

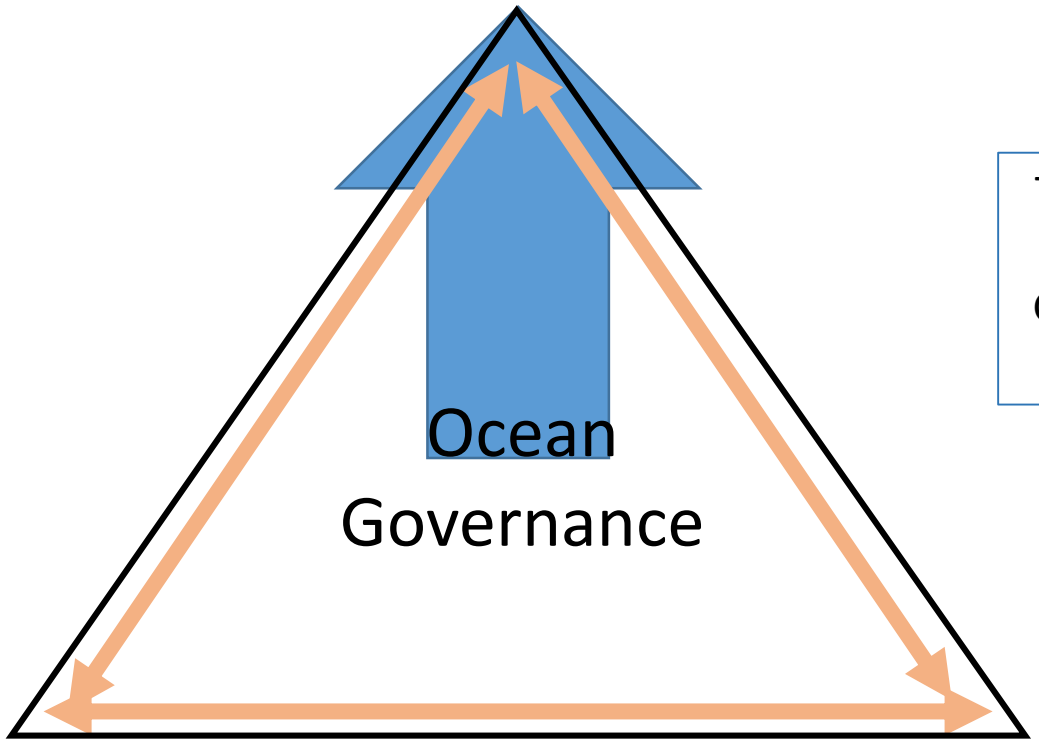
Ecological governance - "a process of informed decision-making that enables trade-offs between competing resource users so as to balance environmental protection with beneficial use in such a way as to mitigate conflict, enhance equity, ensure sustainability and allow accountability" Turton *et al*. 2007

Falkenmark's Trialogue Model of Ecosystem Governance

Hattingh *et al.* 2007;
Turton *et al.* 2007

SOCIETY

Economy
Social
Environment



WHAT INFORMATION IS REQUIRED?

THE ROLE O N
PROVIDING IN RM
GOVERNANCE, A D POLICY
FORMULATION

GOVERNMENT

Rule Making
Rule Implementation
Rule Adjudication

SCIENCE

Research,
Knowledge-bases
Capacity Development
Technology
Innovation

OCEAN ACCOUNTS IN CHANGING OCEANS

CHANGING OCEAN SCIENCE DATA (4IR)

Ocean Robotics
Remote Sensing
Big Data
Analyses & Modelling
Machine Learning
Automated Analytics

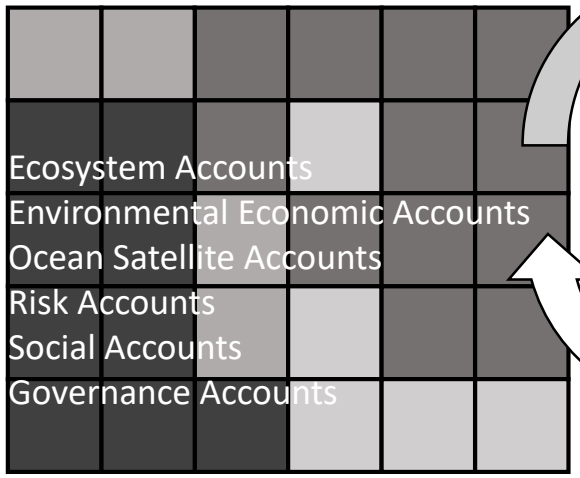
INFORMATION OF A CHANGING OCEAN

Oceanography
Biotopes, Habitats, Ecosystems
Biodiversity
Ecosystem Service & Abiotic Service
Resource Use
Social Sciences
Economic Sciences

SPATIAL APPROACHES

STATISTICS OF CHANGING OCEAN RESOURCE USE

STANDARDISED AND CONSISTENT OCEAN ACCOUNTS FRAMEWORKS



Flows To
BLUE ECONOMY
Flows From

STANDARDISED ACCOUNTS

INDICATORS OF OCEAN CHANGE

MODELS & SCENARIOS

GOVERNMENT Authorities

POLICY DEVELOPMENT

SOCIETY Users

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Policy and governance use cases for Ocean Accounts

— *Strategic and planning decisions:*
Marine Spatial Planning, and formulation of strategic development plans
— *Regulatory decisions:*
Promulgation of regulatory instruments and granting of conditional permits and licenses for ocean economic activities
— *Operational and management decisions:*
Integrated Coastal Zone Management, Ecosystem-based Management, Management of Marine Protected Areas and Disaster Risk Response.
— *Finance and investment decisions:*
fiscal policies and programmatic investment related to oceans
— *Technical advice and reporting:*
Cost-benefit assessment, Environmental impact assessments, Progress reporting against agreed commitments, and

Informed decision-making in the above categories.

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Ocean Accounts - *Why?*

1. Development of integrated indicators that decision-makers can understand for informed decision making that includes sustainability and inclusivity within ocean planning (extends from an ecosystem level to a National Accounts level)
2. The development of inventories that strengthen national statistical systems,
3. Integration of large volumes of novel ocean data and identification of data gaps and needs.
4. Justification of the value of Research, Management and Policy in the ocean space.
5. Positioning of strategy development in ocean economic development.

THE NEED FOR OCEAN ACCOUNTS IN AFRICA

Seventy percent (38) of Africa's 54 sovereign states are coastal.

Africa has a coastline of some 30,500 to 40,000 km.

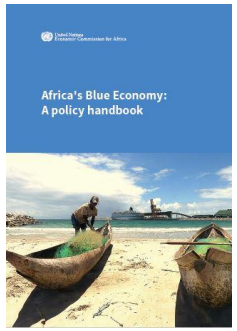
Africa's oceans and inland water areas are three times the size of its landmass. Maritime zones under Africa's jurisdiction total about 13 million square kilometres and approximately 6.5 million square kilometres of relatively accessible continental shelf.

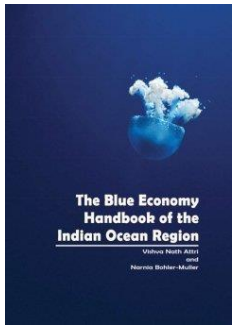
90 percent of Africa's imports and exports conducted by sea.

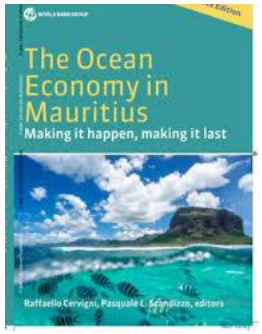
Freshwater and ocean fish provide important food and nutritional security of over 200 million Africans and provide income for over 10 million people.

There are a number of continental, regional, and national ocean economy advancement initiatives.

Africa is currently relatively under-represented in the Ocean Accounting dialogue.







GOAP HAS AN AFRICAN COMMUNITY OF PRACTICE
https://www.oceanaccounts.org/africa-community-of-practice/

Associated to this are a number of CoPs or Working Groups including

1. The Western Indian Ocean Governance Exchange Network Working Group on Ocean Accounts https://wiogen.org/wiogen-themes/oceans-accounts/

2. The South African NRF CoP on Ocean Accounts Frameworks
https://www.algoabayproject.com/ocean-accounts-framework

3. The Africa NCA CoP Oceans Accounts Working Group
https://ecastats.uneca.org/ncacop/Ocean-Accounts

The aim of which is the creation of an awareness, an interest and an appetite for use of ocean accounts in ocean governance and decision making processes.

BREAK – DISCUSSION

WHAT WOULD PARTICIPANTS LIKE TO SEE IN FUTURE WORKSHOPS OF THIS NATURE ?

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