



# Economic and environmental accounts in Chile: Insights and challenges

*Enrique Calfucura Tapia*

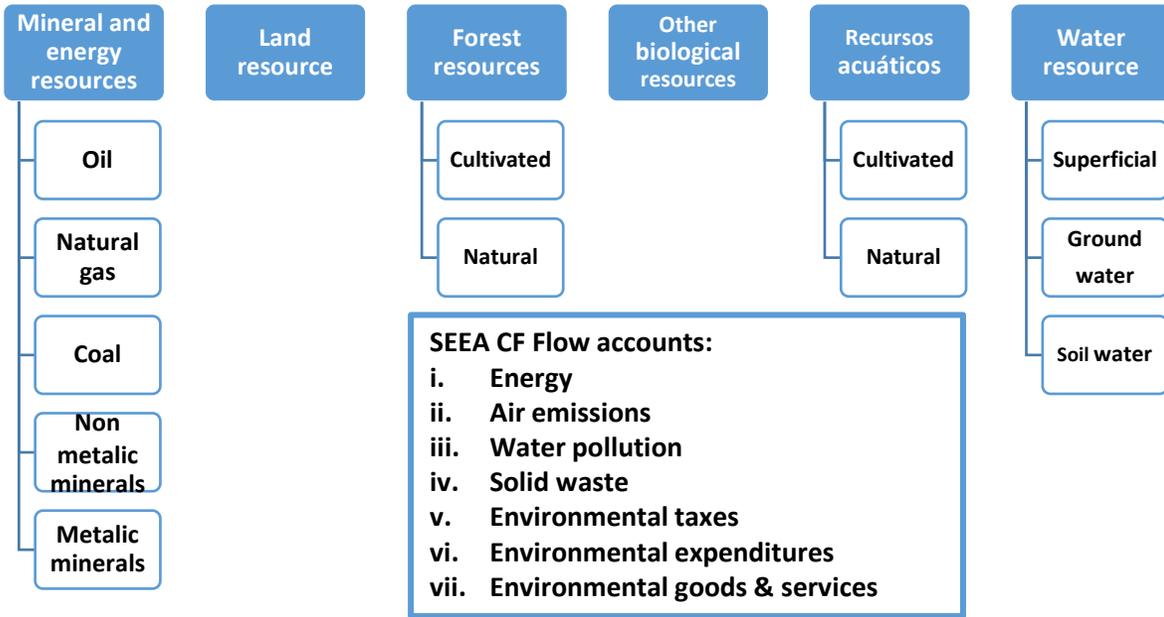
Macroeconomic Statistics Area, Statistics and Data Division

Central Bank of Chile

September 26, 2023

# What is Natural Capital?

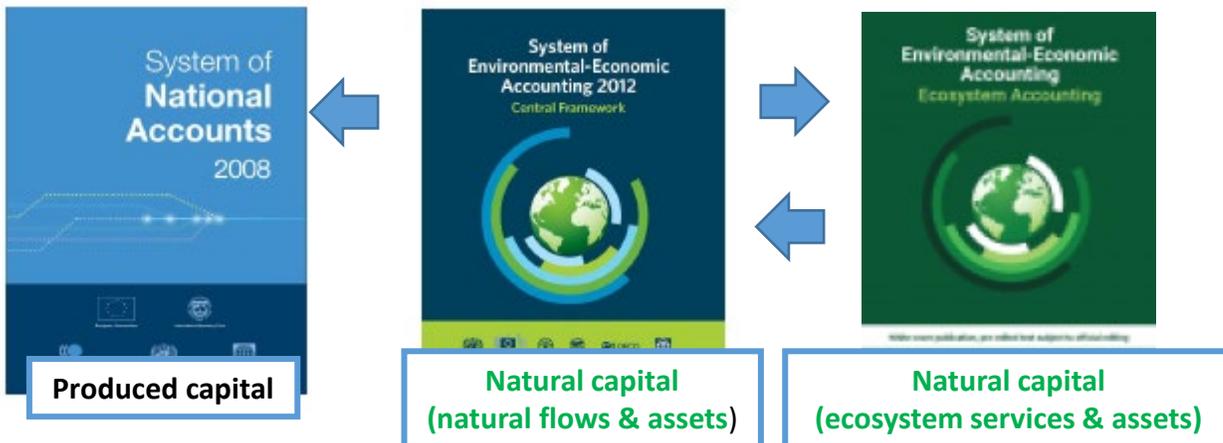
## Natural assets accounts (SEEA CF)



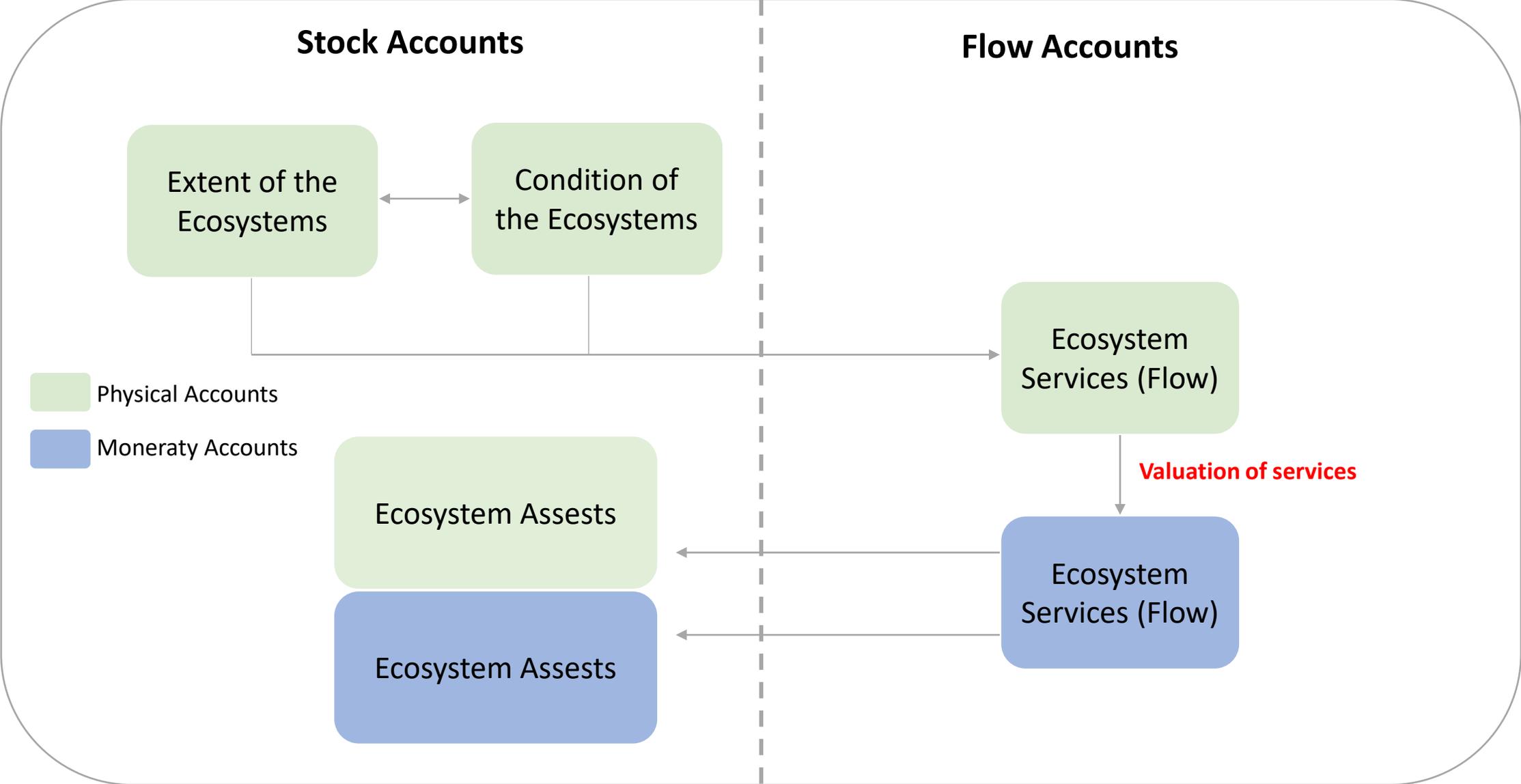
## Ecosystem accounts (SEEA EA)



Source: PBL, RIVM, WUR, CICES 2014

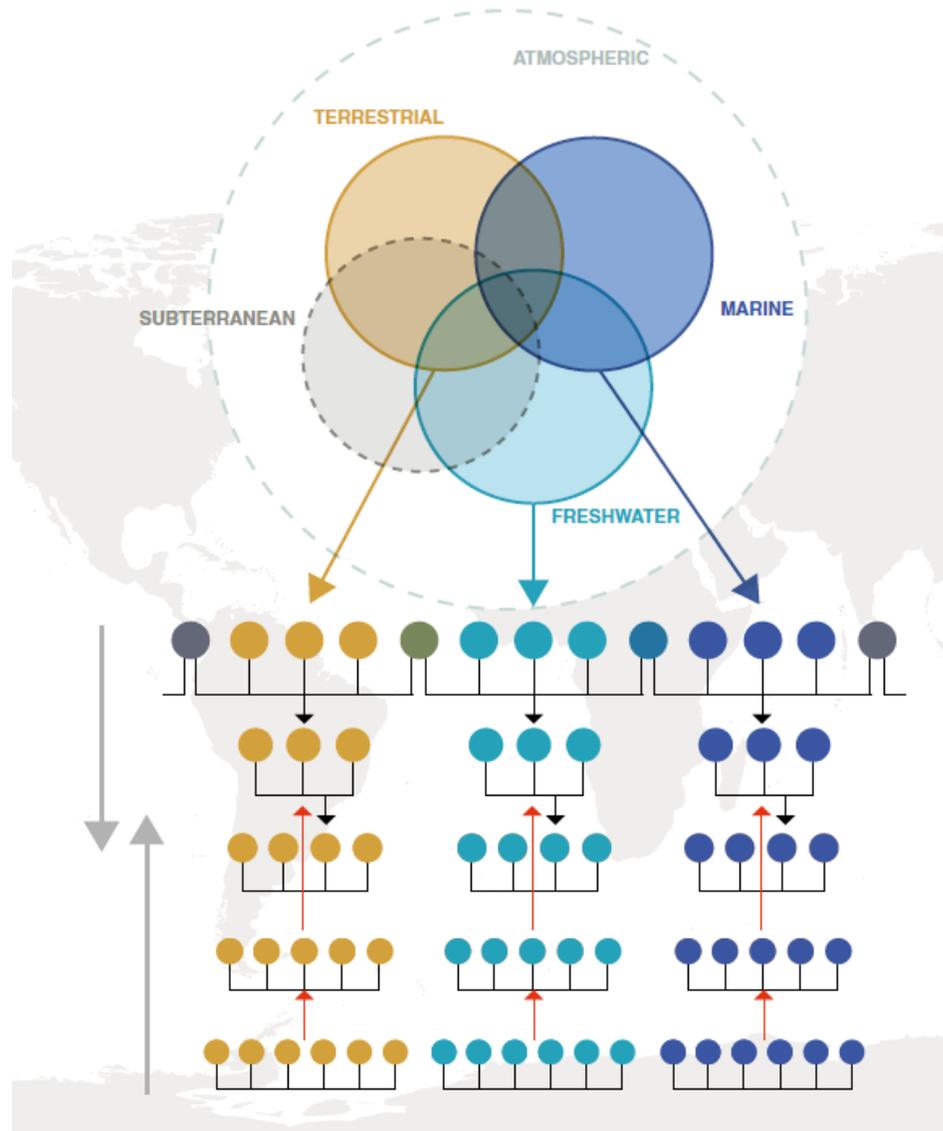


# What are the Ecosystem Accounts?



# Extent Account: Ecosystem Classification

Hierarchical structure of Global Ecosystem Typology

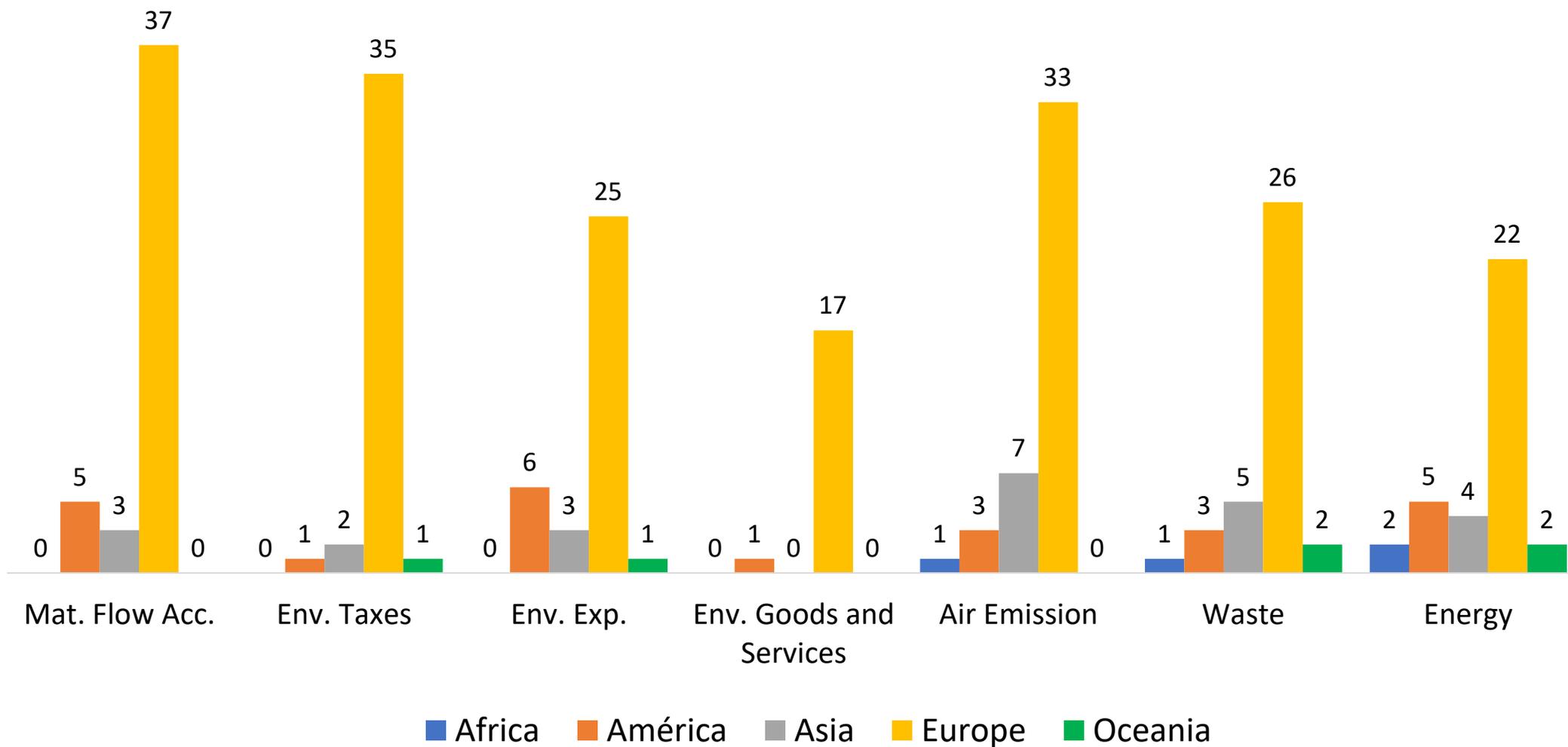


Realm	Biome
Terrestrial	T1 Tropical-subtropical forests
	T2 Temperate-boreal forests & woodlands
	T3 Shrublands & shrubby woodlands
	T4 Savannas and grasslands
	T5 Deserts and semi-deserts
	T6 Polar-alpine
	T7 Intensive land-use systems
Freshwater	F1 Rivers and streams
	F2 Lakes
	F3 Artificial fresh waters
Marine	M1 Marine shelves
	M2 Pelagic ocean waters
	M3 Deep sea floors
	M4 Anthropogenic marine systems
Subterranean	S1 Subterranean lithic systems
	S2 Anthropogenic subterranean voids
Transition	TF1 Palustrine wetlands
	FM1 Semi-confined transitional waters
	MT1 Shoreline systems
	MT2 Supralittoral coastal systems
	MT3 Anthropogenic shorelines
	MFT1 Brackish tidal systems
	SF1 Subterranean freshwaters
	SF2 Anthropogenic subterranean freshwaters
	SM1 Subterranean tidal systems

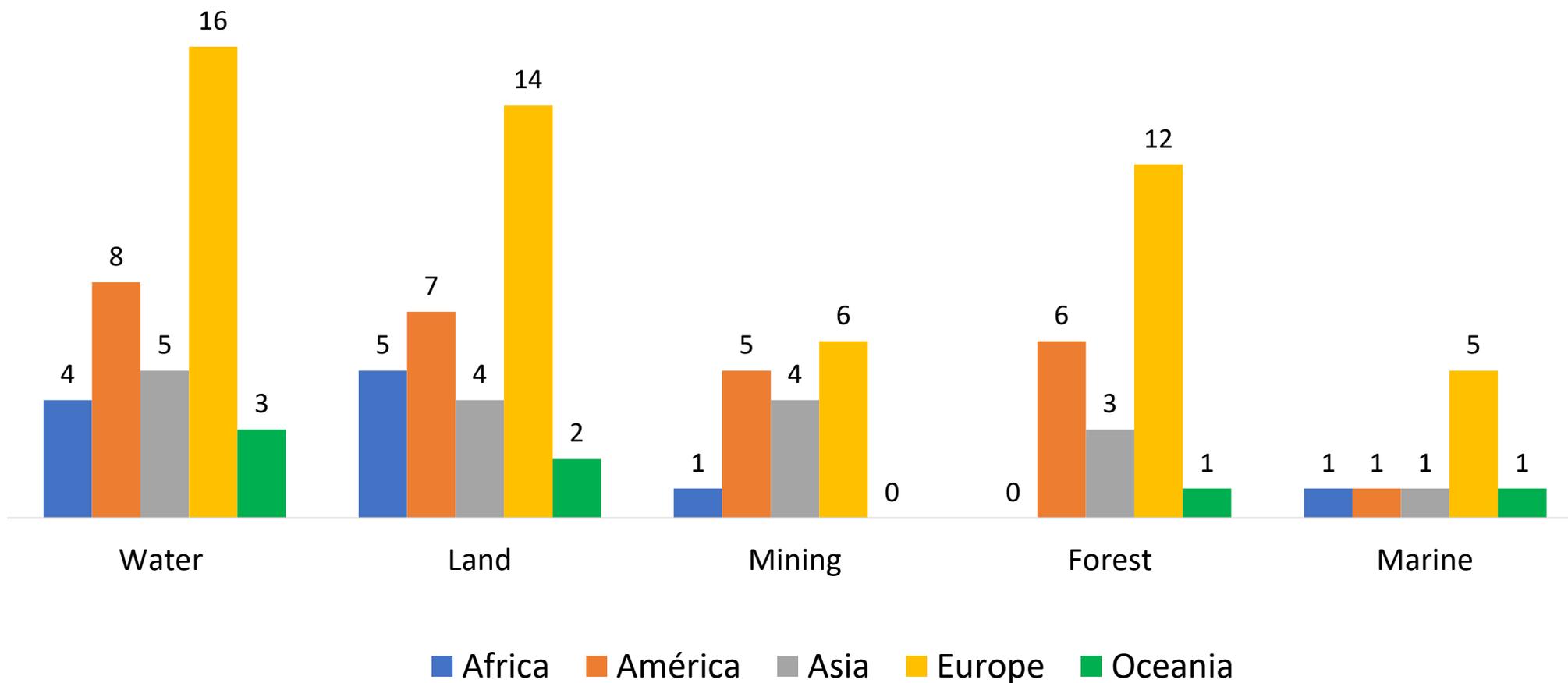
# Condition Account: Indicators

ECT groups	Indicators category	Indicator examples
<b>Group A: Abiotic ecosystem characteristics</b>	Water availability	Hydrological flow
	Soil structure	Soil Organic Carbon
	Air quality	Pollutant concentrations
	Water quality	Dissolved oxygen
	Soil quality	Nitrogen content
<b>Group B: Biotic ecosystem characteristics</b>	Species	Red-list indices/conservation status
	Vegetation/biomass	Vegetation density or anual máximo NDVI
	Processes	Abundance or diversity of pollinators
	Disturbance	Fire risk
<b>Group C: Landscape level characteristics</b>	Composition	Landscape diversity
	Connectivity/fragmentation	Patch size

# Flow Accounts, SEEA Central Framework

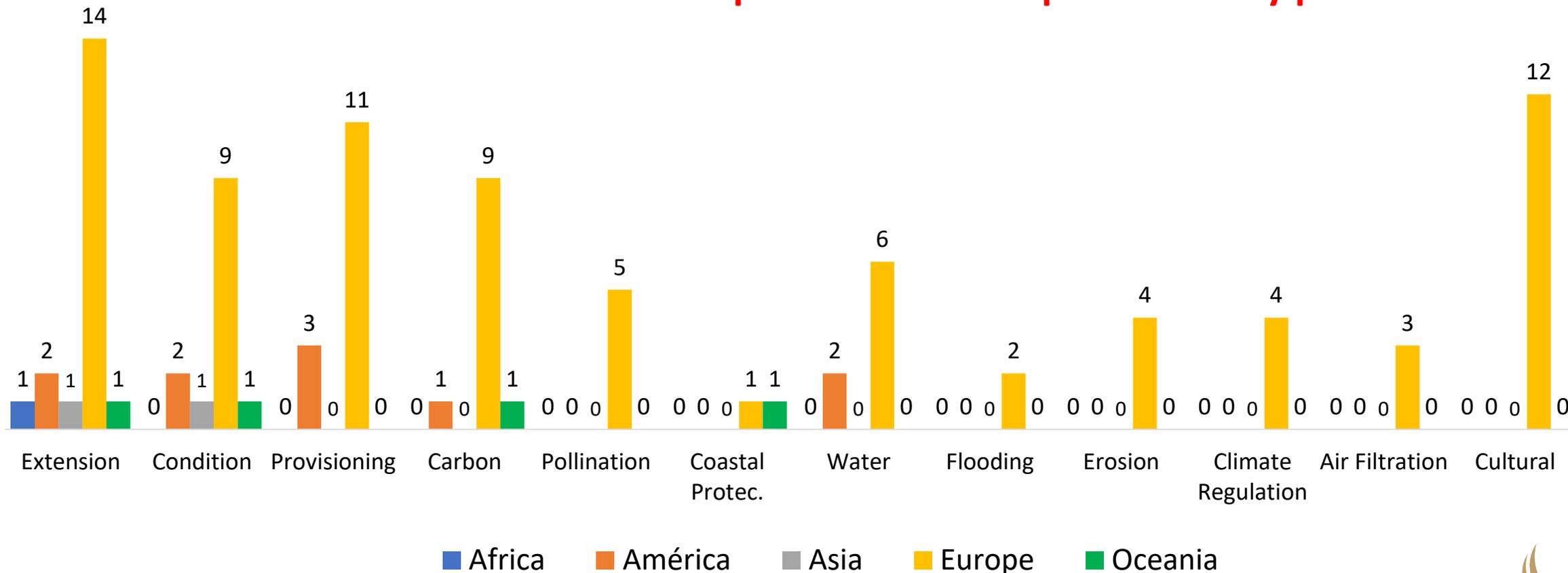


# Natural Assets Accounts, SEEA Central Framework



# Ecosystem Accounts, SEEA Ecosystem Accounts

Experiences in Europe are mainly pilots !



# Natural capital in Chile

## The Context

1. The CBCH has among its functions to compilation of national accounts according with guidelines from the UN SNA.
2. The CBCH is part of the **OECD informal Expert Group on Natural Capital**.
3. The CBCH is member of the Network of Central Banks and Supervisors for Greening the Financial System (NGFS) where is involved in the development of climate and nature-related financial risk frameworks and data.
4. The CBCH is a technical advisor to the Natural Capital Committee (Ministry of Environment, Ministry of Finance and Ministry of Economy).
5. The Ministry of Environment compiles many environmental indicators that are relevant for natural capital accounting.

## The implementation

1. The CBCH is carrying out a hybrid implementation
  - SEEA CF and SEEA EA where methodologies and data are available (**land use, marine resources, minerals, energy, water, emissions; ecosystem extent accounts and condition accounts, provisioning ecosystem services**)
  - **Regulating ecosystem services are very important but intangible.** The CBCH is working on dealing with the methodological and informational issues for this kind of ecosystem services.
2. **Collaborative work:** the NCC is leading a pilot of natural capital intended to support public policies (GEF-World Bank project in partnership with the Natural Capital Project/Stanford University).

# Remark: Importance of Land Use and Land Cover Accounts

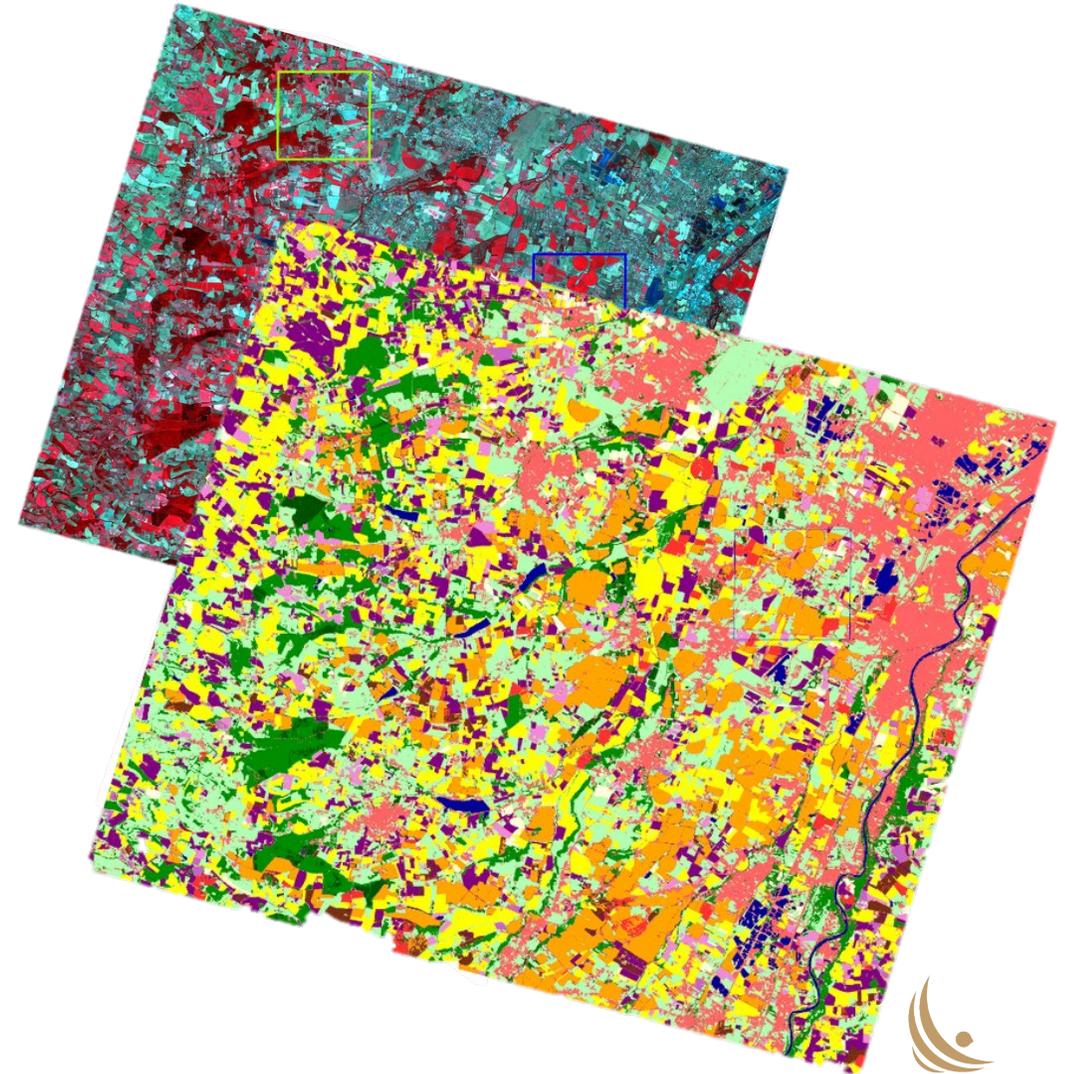
Compilation:

1. Land use and land cover mapping
2. Land use and land cover change and transition mapping
3. Land use physical and monetary accounts

Development of a semi-automated algorithm that allows the replication of both products for different dates in the past and future.

These accounts are key to address some ecosystem accounts:

1. Land cover mapping as input for Ecosystem Extent Accounting
2. Land cover mapping as input for Ecosystem Condition Accounting
3. Land cover mapping as input for Ecosystem Services (Flow and Asset) Accounting



## SEEA CF Accounts

1. Accounting for mineral resources - adoption of new classifications for measuring economic resources and reserves.
2. Accounting for energy resources - identify the contribution of each of the power sources - hydro, thermo, solar and wind – for the supply-use table.

## SEEA EA Accounts

1. Modeling physical ecosystem services for a territory where climates and ecosystems are diverse
2. Valuation of regulating services is a work in progress.

## Both SEEA Frameworks

1. Valuation of natural assets and provision ecosystem services requires (i) physical capital at the resource level, and (ii) private return for the physical capital.
2. Dealing with the institutional framework for the valuation of natural and ecosystem services
3. Modelling and imputing data for small and medium agents where information is less abundant and precise

### Regions



### Communes



### Basins



### Watersheds



### Catchments



### Ecosystems

