

System of
Environmental
Economic
Accounting

Introduction to water accounting

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Environmental-Economic Accounts Section

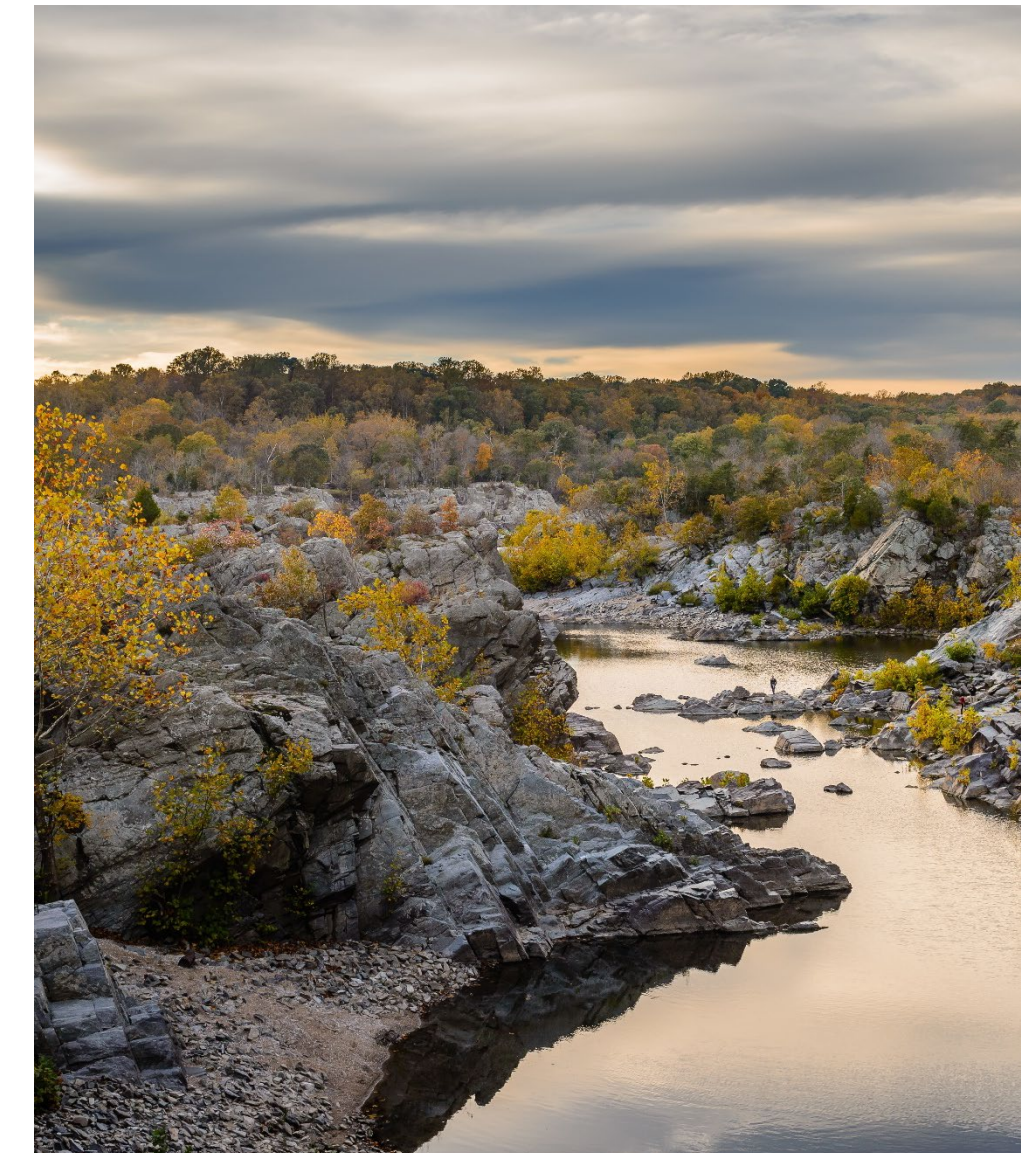
United Nations Statistics Division



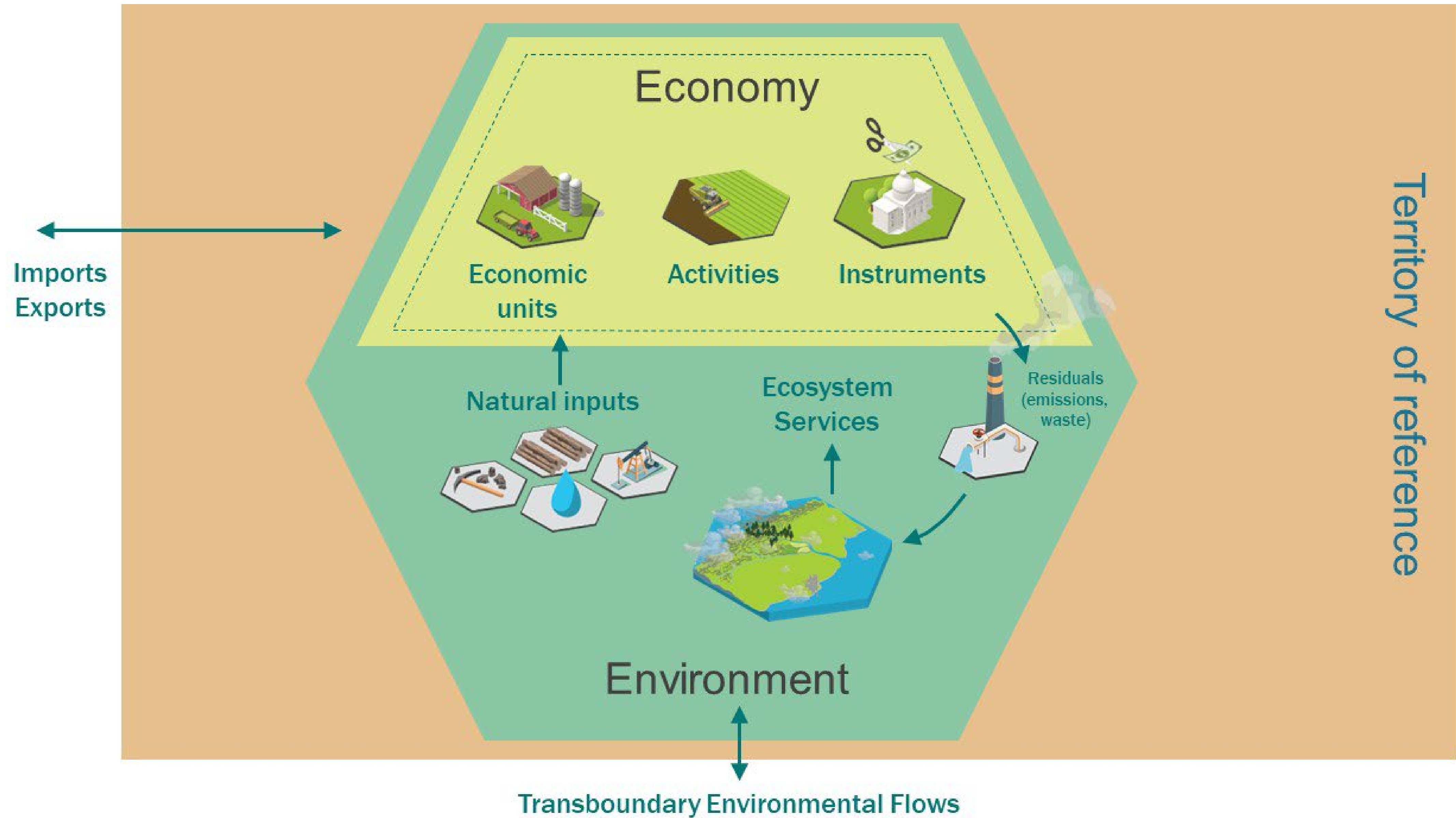
United Nations

The Need for Natural Capital Accounting

- Our economy + well-being crucially depends on nature
- Economy also impacts nature through depletion and degradation
- Both aspects (dependencies + impacts) not well reflected in GDP or the SNA
- Decision makers need key information necessary to effectively pursue sustainable development
- **System of Environmental Economic Accounting (SEEA)** developed to address these shortcomings
- SEEA integrates information on the economy and the environment showing their interrelationship complementing the System of National Accounts



The Environment Economy Nexus



Main types of water accounts

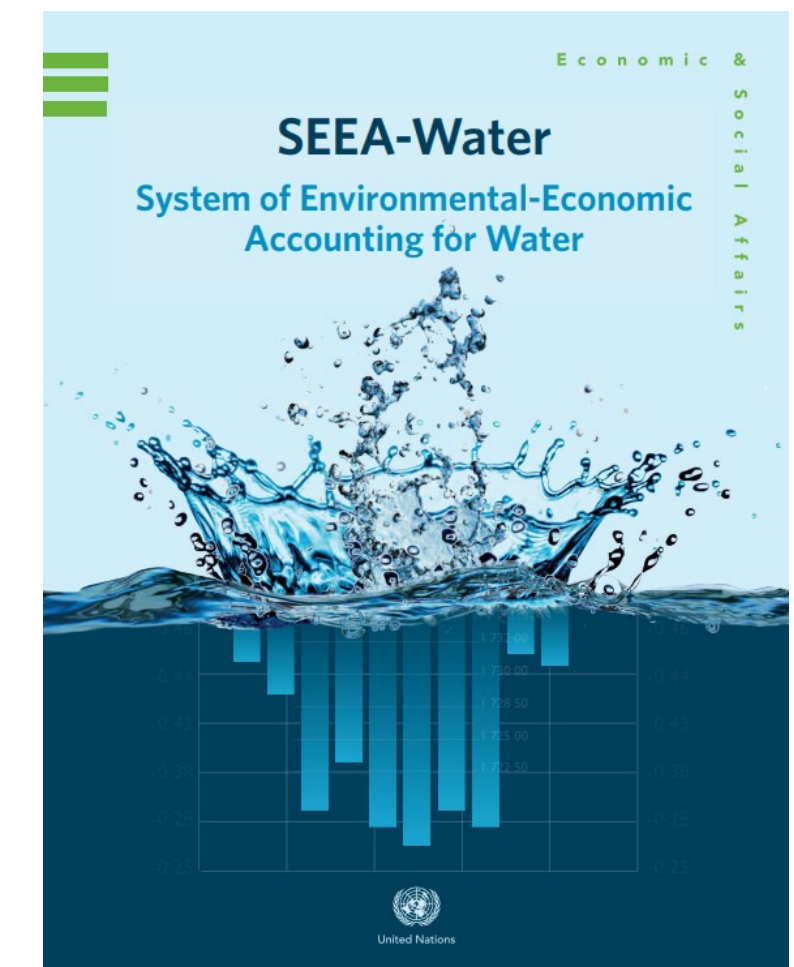
SEEA Central Framework

- Asset accounts
- **Physical water supply and use tables (PSUTs)**
- Emission accounts
- **Hybrid and economic accounts**

SEEA Ecosystem accounts

- Extent accounts (freshwater / marine ecosystem types)
- **Condition accounts**
- Ecosystem services (e.g. water flow regulation)

Monetary valuation



Use table in 2020 in the Netherlands

	Million m3	Agriculture, forestry and fishing	Mining and quarrying	Manufacturing industry	Energy sector	Water collection, treatment and supply	Private waste-water treatment	Waste management services	Construction	Public waste-water treatment	Services	Households	Accumulation	Export	Environment	Total use
		A	B	C	D	E36	E37	E38-39	F	O84.1	G-U*					
(I) Water flows from environment to economy		372,2	29,4	3.089,8	8.742,5	1.333,5	1,0	721,9	45,0	897,6	47,0	0,0				15.279,9
Inland water resources		307,2	2,7	2.420,8	3.520,6	1.333,5	1,0	720,3	45,0	380,2	47,0	0,0				8.778,3
Groundwater		214,2	0,3	113,2	0,3	839,8	0,2	3,1	45,0	380,2	47,0	0,0				1.643,3
Soil water		-														-
Surface water		93,0	2,4	2.307,6	3.520,3	493,7	0,8	717,2	0,0	0,0	0,0	0,0				7.135,0
Other water sources		65,0	26,7	669,0	5.221,9	0,0	0,0	1,6	0,0	517,4	0,0	0,0				6.501,6
Precipitation		65,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	517,4	0,0	0,0				582,4
Sea water		0,0	26,7	669,0	5.221,9	0,0	0,0	1,6	0,0	0,0	0,0					5.919,2
(II) Abstracted water		414,1	31,7	3.293,7	8.753,0	116,7	3,0	726,7	47,8	903,2	148,5	855,3		2,0		15.295,7
Distribution		41,9	2,3	209,0	10,5	8,0	2,0	4,8	2,8	5,6	101,5	855,3		2,0		1.245,7
Drinkingwater		41,9	2,3	140,1	2,6	8,0	2,0	4,5	2,8	5,6	101,5	855,3		2,0		1.168,6
Industry water		0,0	0,0	68,9	7,9	0,0	0,0	0,3	0,0	0,0	0,0	0,0		0,0		77,1
Own use		372,2	29,4	3.084,7	8.742,5	108,7	1,0	721,9	45,0	897,6	47,0	0,0		0,0		14.050,0
Aquaculture		0,0														0,0
Cooling (fresh water)			2,2	2.126,8	3.168,3			646,9	0,0							5.944,2
Cooling (seawater)		0,0	26,7	669,0	5.221,9	0,0		1,6	0,0		0,0					5.919,2
Hydroelectric power generation					0,0											0,0
Irrigation		333,5									0,0	0,0				333,5
Mine water			0,0													0,0
Other uses		38,7	0,5	288,9	352,3	108,7	1,0	73,4	45,0	897,6	47,0	0,0				1.853,1
(III) Wastewater flows within the economy		0,0	0,0	9,9	0,0	0,0	3,4	1,1	0,0	1.055,0	0,7	0,0		0,0		1.070,1
Reuse		0,0	0,0	2,3	0,0	0,0	0,0	1,0	0,0	0,0	0,4	0,0				3,7
Wastewater		0,0	0,0	7,5	0,0	0,0	3,4	0,1	0,0	1.055,0	0,3	0,0		0,0		1.066,3
Own treatment		0,0	0,0	7,5	0,0	0,0	0,0	0,1	0,0	0,0	0,3	0,0				7,9
Wastewater (to) treatment						0,0	3,4			1.055,0				0,0		1.058,4
(IV) Return flows of water															14.458,7	14.458,7
To inland water resources															6.466,6	6.466,6
Groundwater (+soil water)															333,5	333,5
Surface water															6.133,1	6.133,1
To other sources**															7.992,1	7.992,1
(V) Evapotranspiration and water in products													-	12,0	-	836,1
Total of Use table		786,3	61,1	6.393,4	17.495,5	1.450,2	7,4	1.449,7	92,8	2.855,8	196,2	855,3	-	14,0		

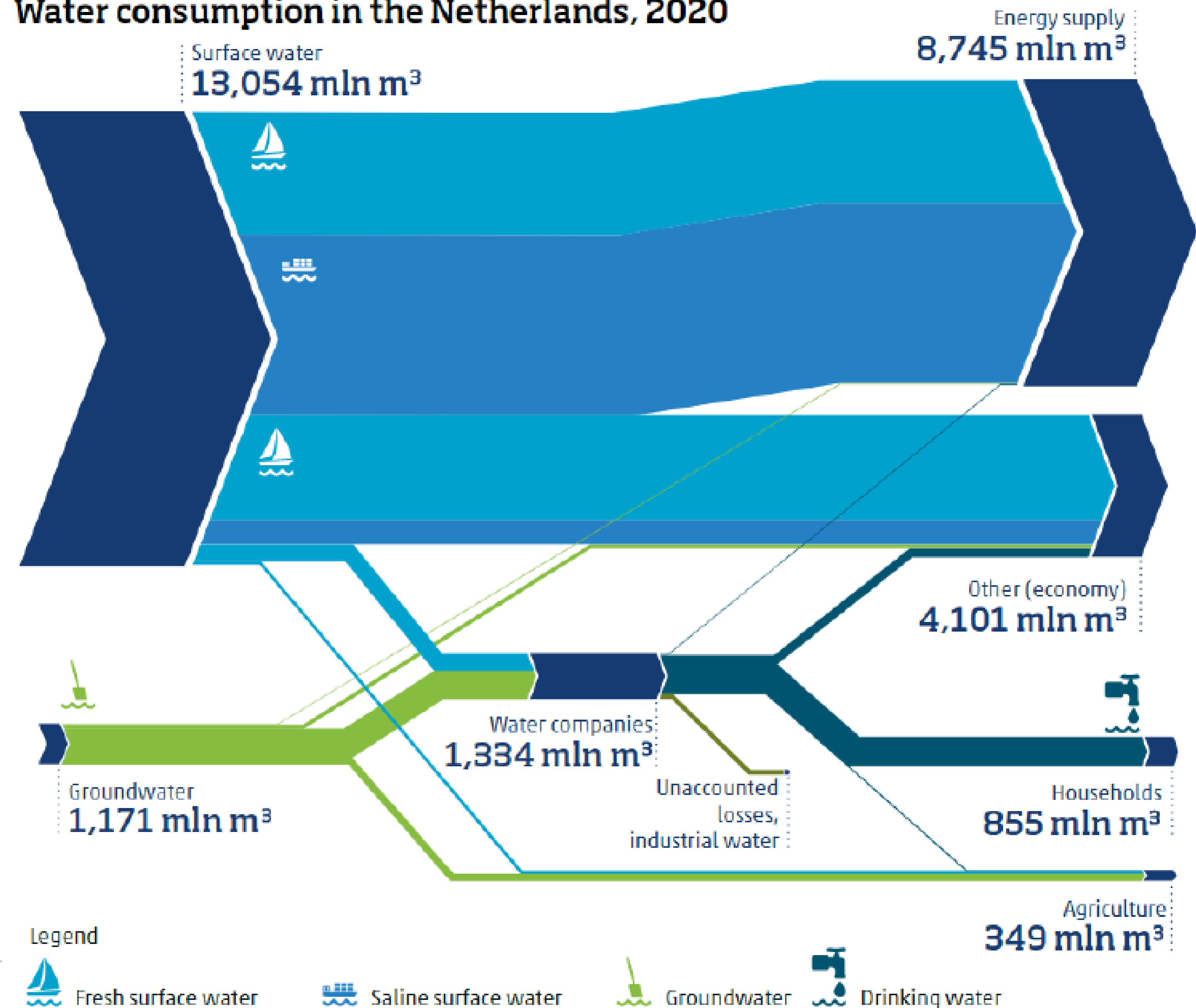
*excluding O84.1

**including returns with unknown destination

Example Netherlands

- Visual presentation of the physical supply and use table
 - > Water flows in the Netherlands in 2020
 - > From different sources
- Accounts used by Ministry of infrastructure and Water Management to report on the EU Water Framework Directive every three years

Water consumption in the Netherlands, 2020



Example Brazil – hybrid account

Intensity of water consumption (liters/R\$)

Brazil

Economic activities	2013	2014	2015	2016	2017
Agriculture, forestry, and fishing	1,324.9	1,265.0	1,290.2	1,053.8	1,060.5
Agriculture, forestry, and fishing (1)	104.9	108.9	109.5	95.5	95.5
Extractive industries	1.4	1.5	2.5	5.2	3.4
Manufacturing industries and construction	4.4	3.9	3.6	3.4	3.4
Electricity and gas	1.5	1.8	1.2	0.8	0.7
Other activities	0.2	0.1	0.1	0.1	0.1

Sources: 1. IBGE. 2. Agência Nacional de Águas - ANA.

(1) Without soil water.



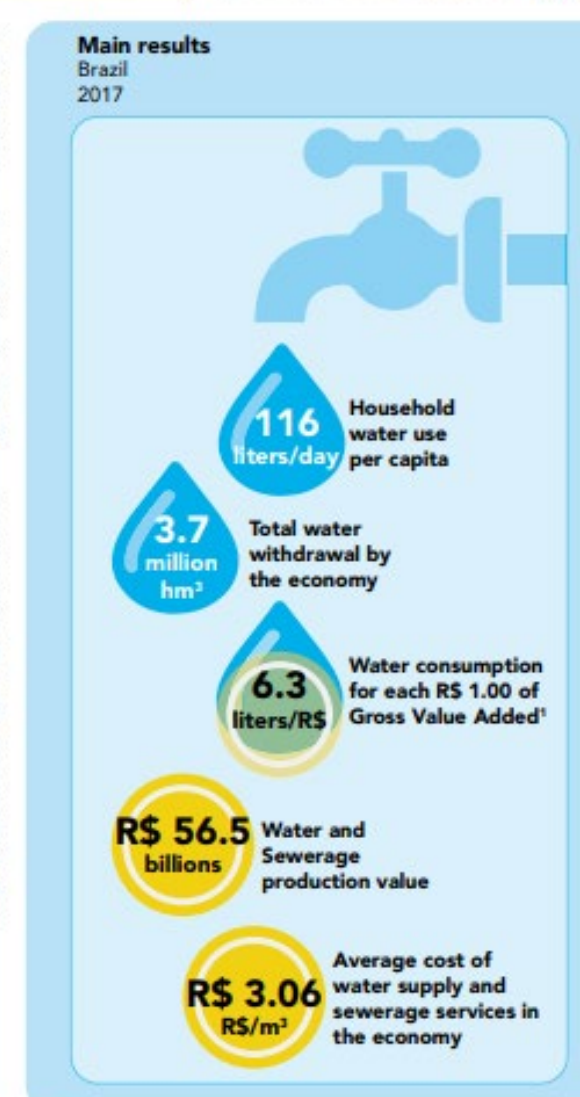
Water resources have an extensive variety of functions and uses, ranging from supporting the integrity of terrestrial ecosystems to human consumption. They are also important when we think about food production, electricity generation, inputs in productive processes, or as a sink for the disposal and dilution of domestic and industrial effluents.

Given the importance of water resources for economic development, it will be necessary to adopt policies that integrate sectoral planning with the management of water resources. Therefore, integrating economic, social and hydrological information will be essential to attain sustainable management of natural resources. Hereto, in order to provide such an integrated information system, the United Nations Statistics Division developed a methodology named the System of Environmental-Economic Accounting for Water (SEEA-Water).

Consistent with this international methodology, the second publication of the Environmental-Economic Accounts for Water in Brazil (EEA-W)¹ aims to continue the compilation and dissemination of information regarding the balance between water availability and water demand of the economy. The development of the EEA-W is the result of the joint efforts of technicians of the National Water Agency (Agência Nacional de Águas – ANA) and the National Statistical Office (Instituto Brasileiro de Geografia e Estatística – IBGE in order to expand the knowledge about these themes, under the Natural Capital Accounting and Valuation of Ecosystem Services (NCAVES) project, with the support of the International Agency for German Cooperation for Sustainable Development (Deutsche Gesellschaft für Internationale Zusammenarbeit - GIZ GmbH), through the cooperation between the Brazilian Ministry of the Environment (MMA); and the European Union² Partnership Instrument, UN Environment and UN Statistics Division.

¹ By editorial decision, the publication has two parts: the first corresponds to this newsletter which highlights the main results of the research, the second part consists of the Technical Notes, among other textual elements, presenting considerations of a methodological nature about the research. The result tables, Technical Notes and other information about the present study are available on the IBGE website, at: <https://www.ibge.gov.br/estatisticas/economicas/contas-nacionais/20207-contas-economicas-ambientais-da-agua-brasil.html#&to=que>.

² The content of the EEA-W Brazil 2013-2017 does not necessarily reflect the opinion of the European Union.



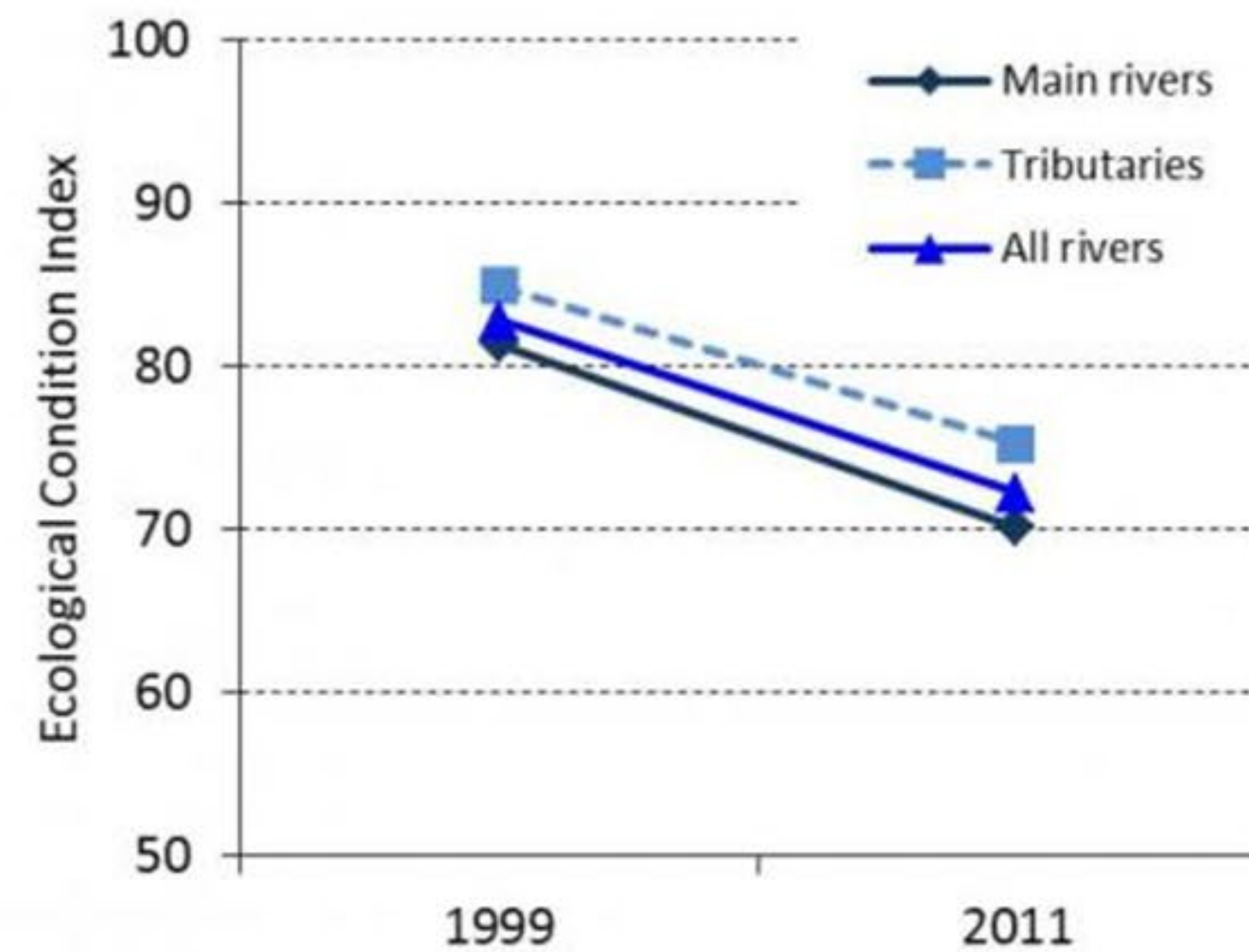
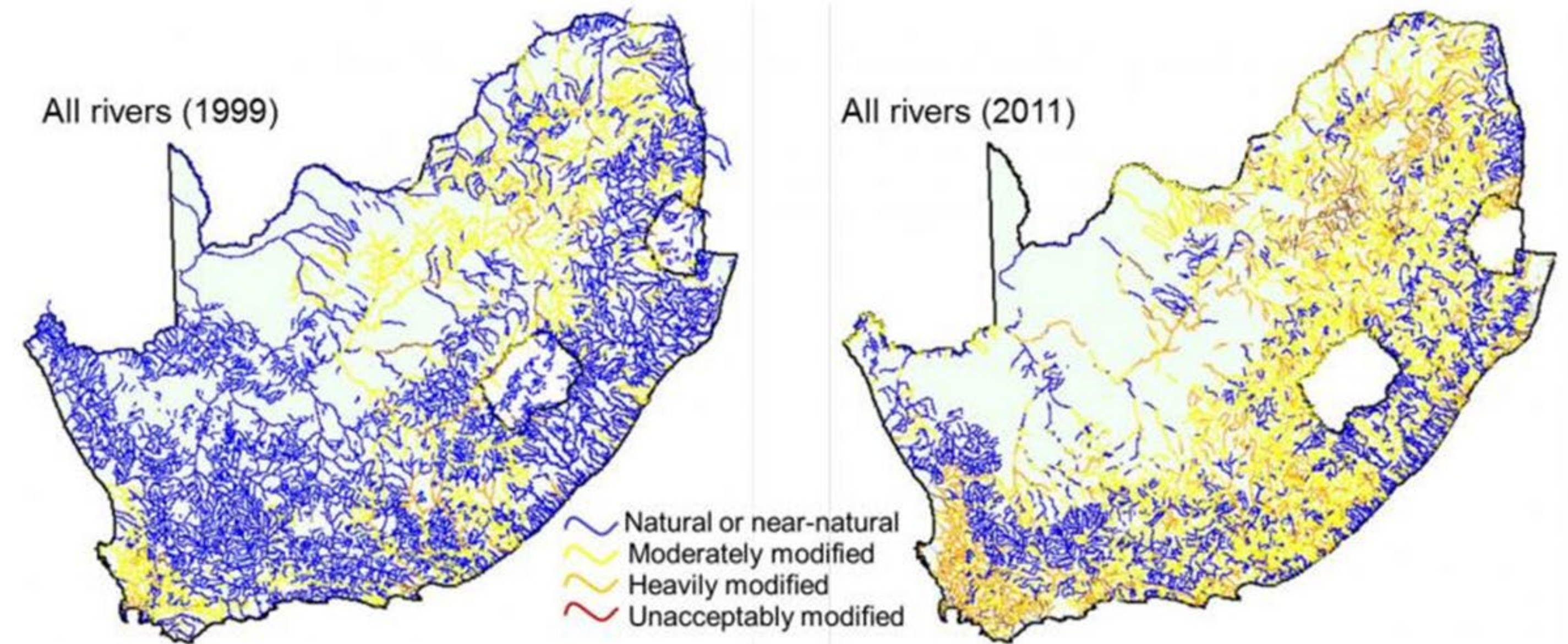
Sources: 1. IBGE. 2. Agência Nacional de Águas - ANA.
(1) There are no estimates of soil water.

Source: IBGE 2018

https://biblioteca.ibge.gov.br/visualizacao/livros/liv101741_informativo.pdf

Example South Africa - ecosystem condition

- South Africa is water-scarce country
- Water ecosystems critical to providing a reliable supply of clean water
- In 2014 piloted accounts for river ecosystems
- Policy use:
 - > Inform National Water and Sanitation Master Plan -> highlights importance of maintaining integrity of freshwater ecosystems as part of water value chain
 - > Accounts have identified areas of decline in river health so that solutions can be identified and targeted to better manage catchments



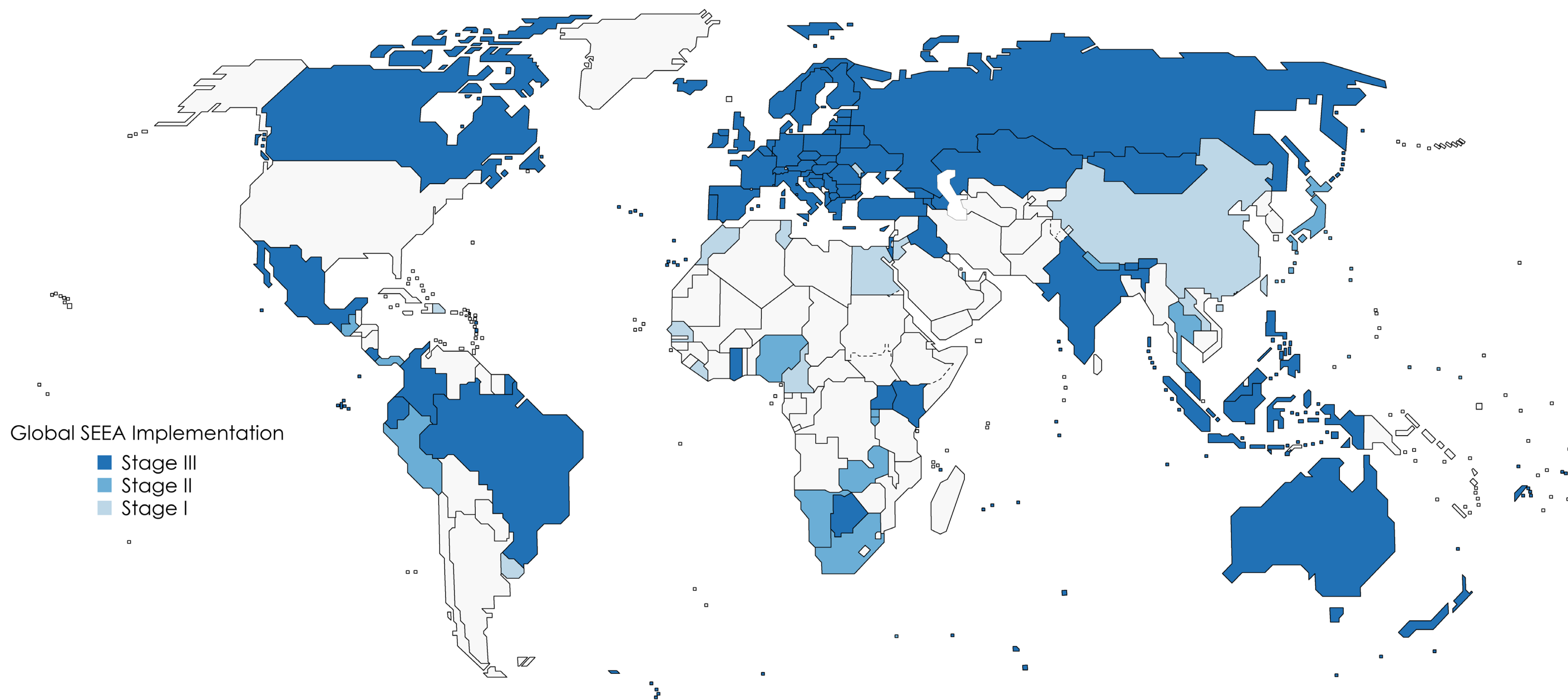
Overall
10% decline
in ecological condition of
rivers
1999 - 2011

Source: Presentation by Mandy Driver, SANBI at Third Forum on Natural Capital Accounting for Policy D

SEEA implementation

- According to 2022 Global Assessment we have 92 countries compiling SEEA
- 42 countries compiling water accounts

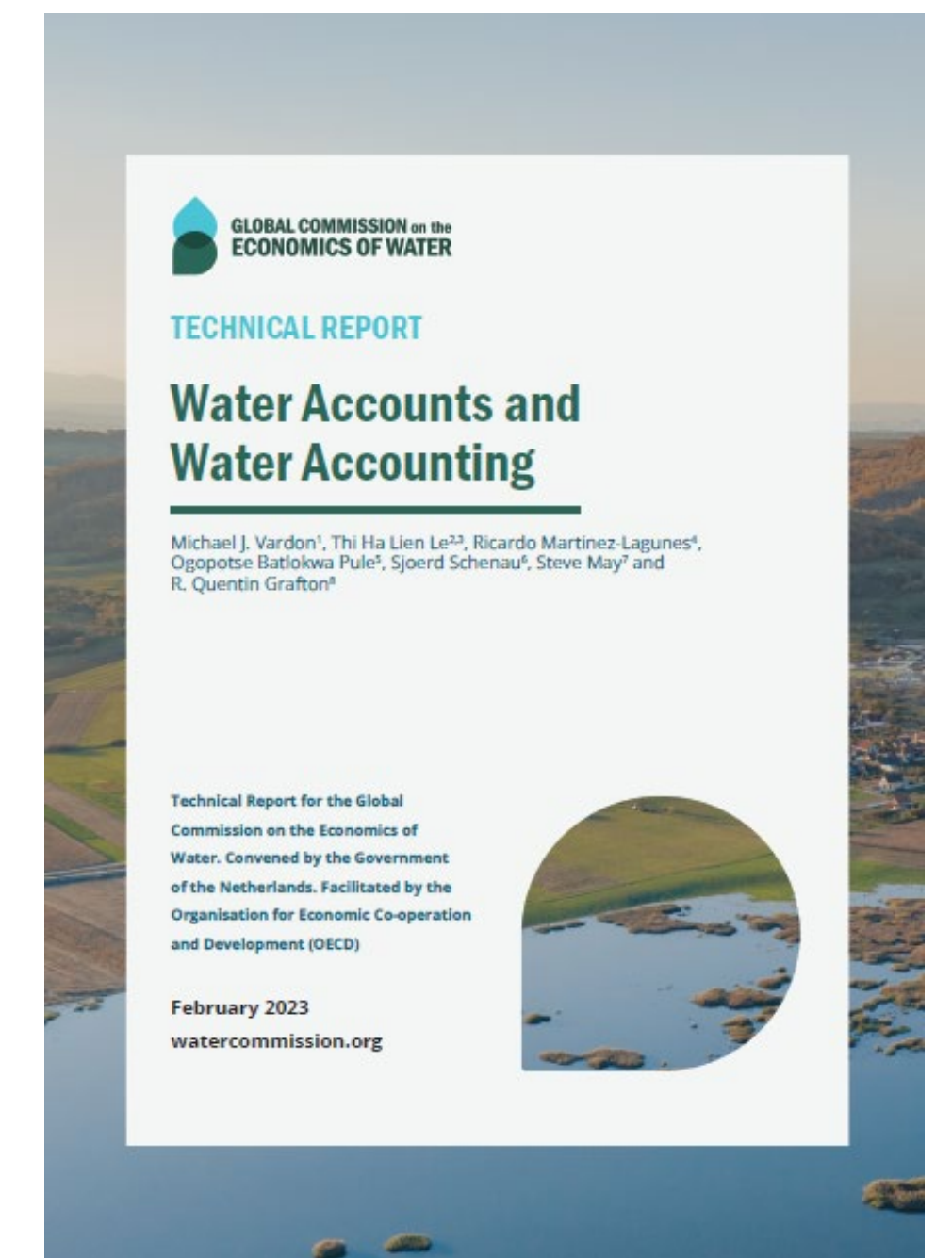
Global SEEA Implementation



Detailed review:

This technical report provides a foundation for water accounts and water accounting. It explains why water accounting is important and, with multiple examples, shows how water accounting is a key information tool needed by all water decision makers.

[Water Accounts and Water Accounting – Global Commission on the Economics of Water \(watercommission.org\)](https://www.watercommission.org)



Conclusions

- There is an increasing number of countries implementing SEEA + water accounts
- There are various types of water accounts, supporting a diverse range of policies
- Provides framework for deriving indicators to support various monitoring and reporting frameworks
- Most commonly compiled (water) accounts are in physical units
- Standardization is important to obtain high-quality, and comparable statistics
- Water accounting due its multi-disciplinary nature catalyzes collaboration between different stakeholders (statistical office, universities, line ministries, etc.)

THANK YOU

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