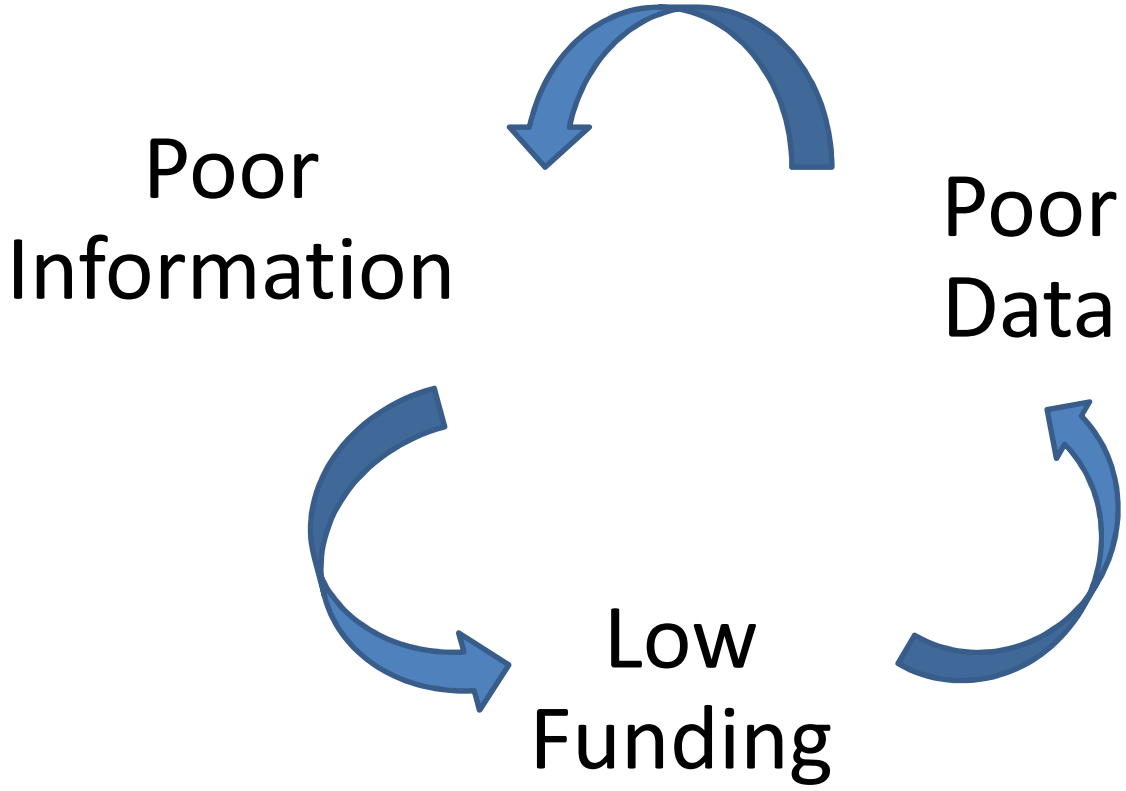
SEEA-Water and Implementation Activities (Guidelines for Water Accounting)

UN Statistics Division

26 Nov 2013

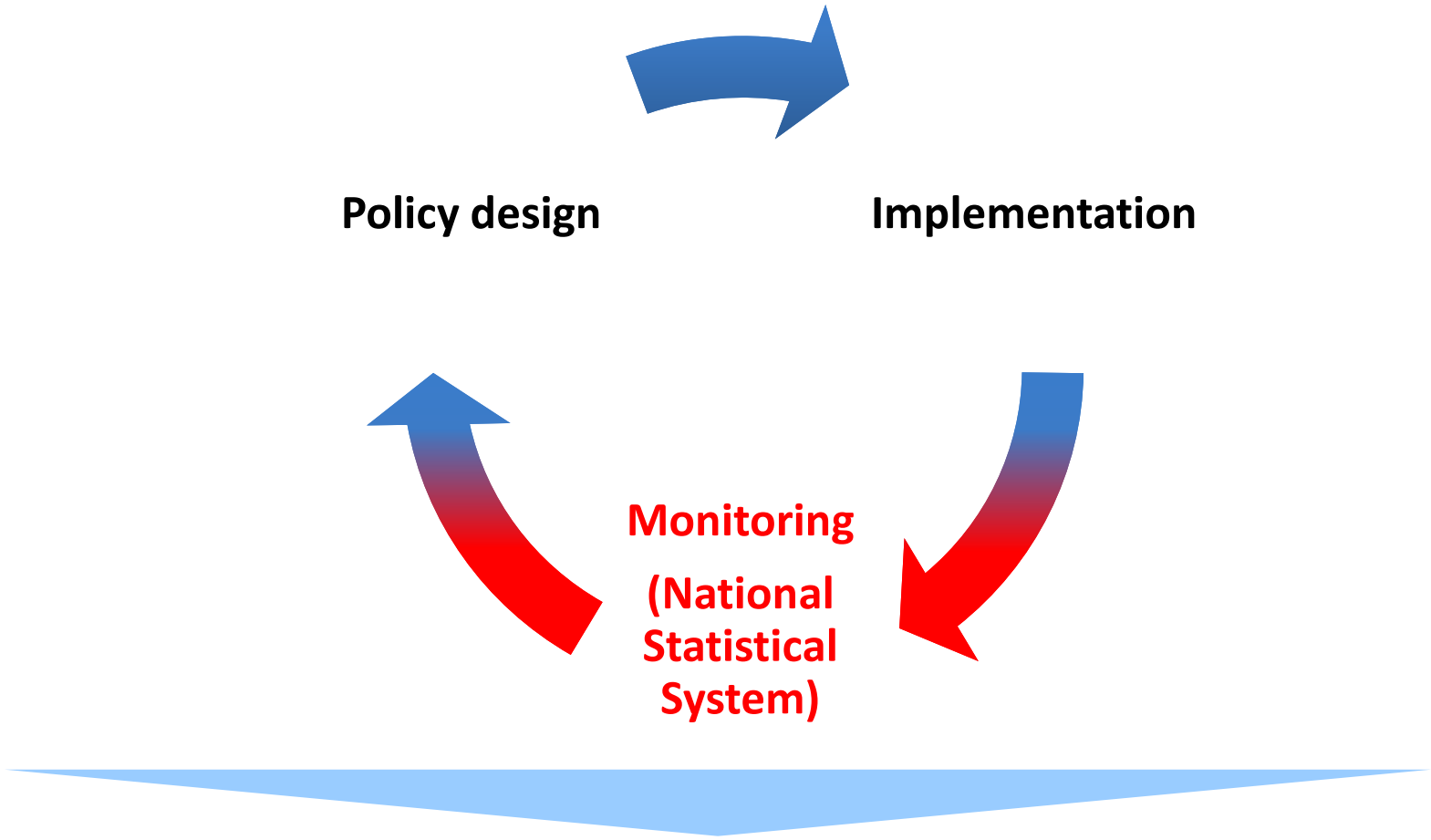
Monitoring water information

Water information is in a vicious cycle: there is insufficient data which is translated into poor information. In turn this results in low funding for data production, having as consequence even poorer data.



This vicious cycle needs to be transformed into a virtuous cycle in which data is transformed into valuable information generating an incentive for producing better data, which in turn results in more and better data. How do we achieve this?

National Statistical Systems (NSS) should provide feedback for policy design and evaluation. A reinforcing loop or virtuous cycle is therefore created.



The virtuous cycle of continuous improvement should exist at sub-national, national and international levels.

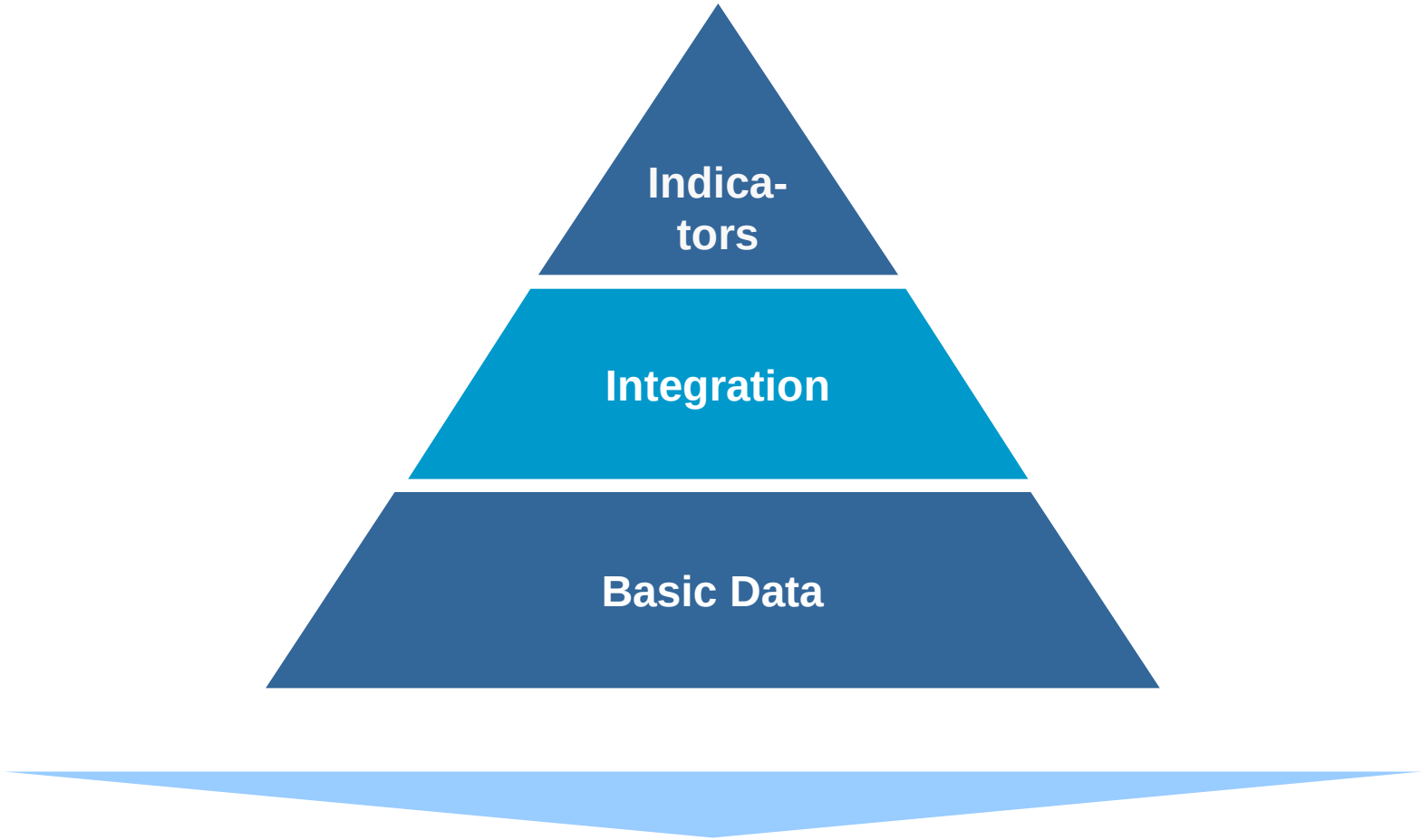
The Global Statistical System (GSS) is a system based on National Statistical Systems (NSS). The United Nations Statistical Commission (UNSC) is the top decision making body of the system.

This design is sustainable, since it is a federated model built upon information systems in Member States. There are agreed principles and methodologies. The information is comparable

Through the UN Statistical Commission several standards have been adopted.

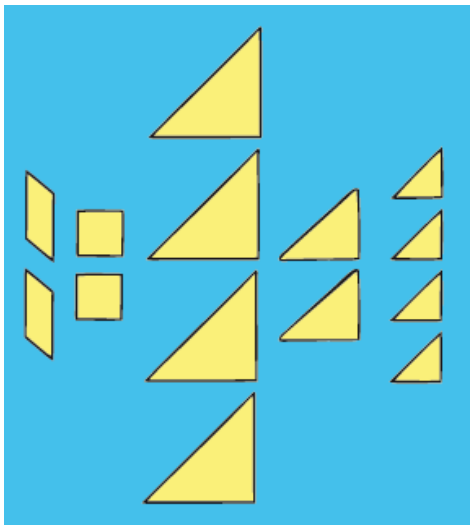
The SNA, the SEEA, the SEEA-Water were designed based on principles rather than conventions. This provides consistency.

The SEEA-Water provides a framework for integrating basic data in order to produce policy relevant information and indicators.

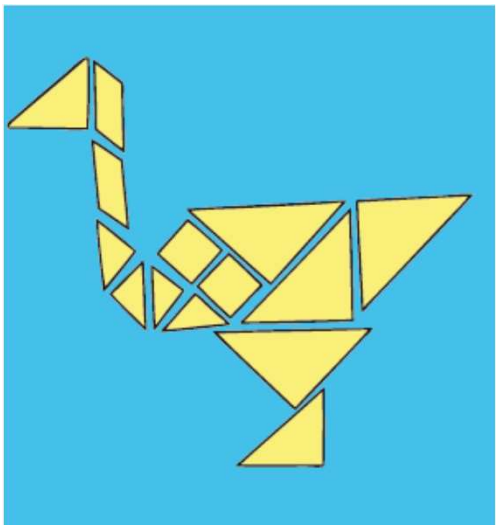


Different users require different levels of aggregation of the information. Information should be organized in a way in which different levels of aggregation are possible.

The SEEA provides a framework for transforming sectoral data into integrated policy-relevant information.



Sectoral Data

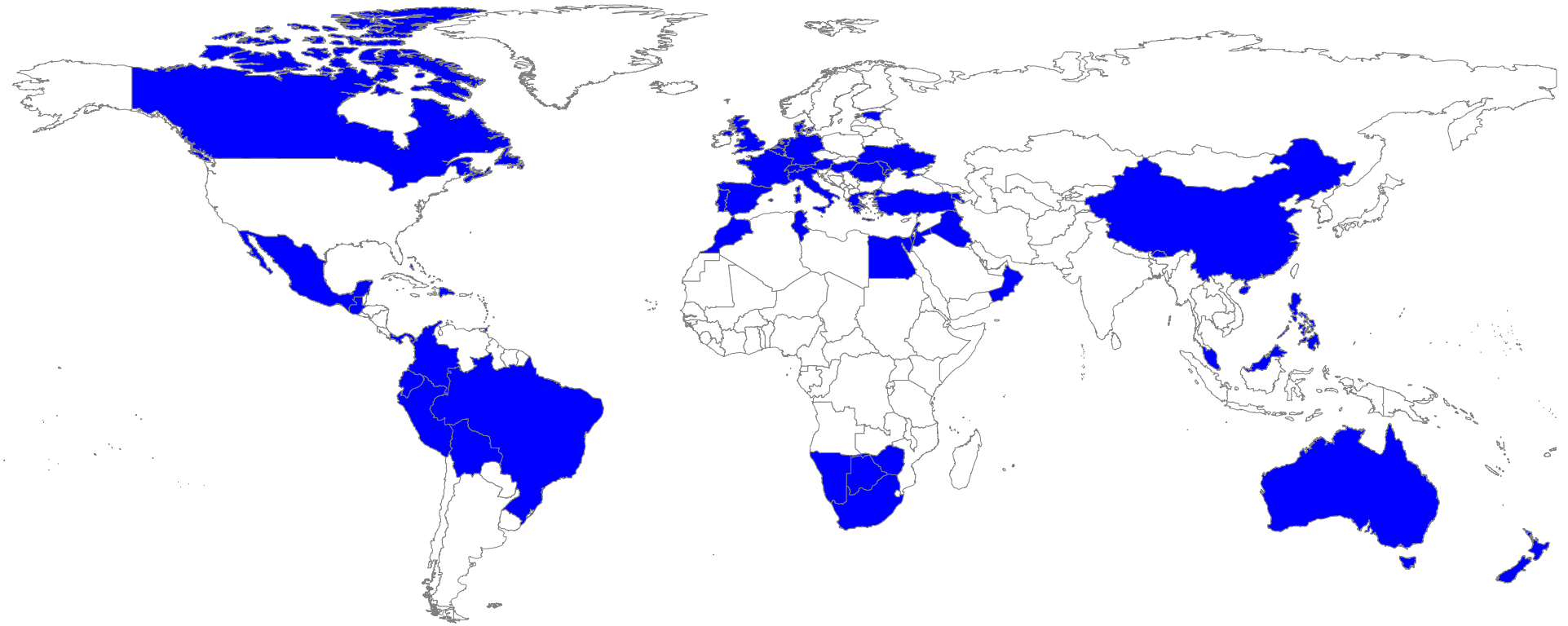


Integrated information

Integrated information provides a comprehensive picture to support policy making.

Implementation

More than fifty countries around the world are doing or planning to do water accounts.



Countries, such as Australia and the Netherlands have institutionalized water accounts. Others, such as, Botswana, Brazil, Colombia, Mauritius, and Mexico are doing significant progress.

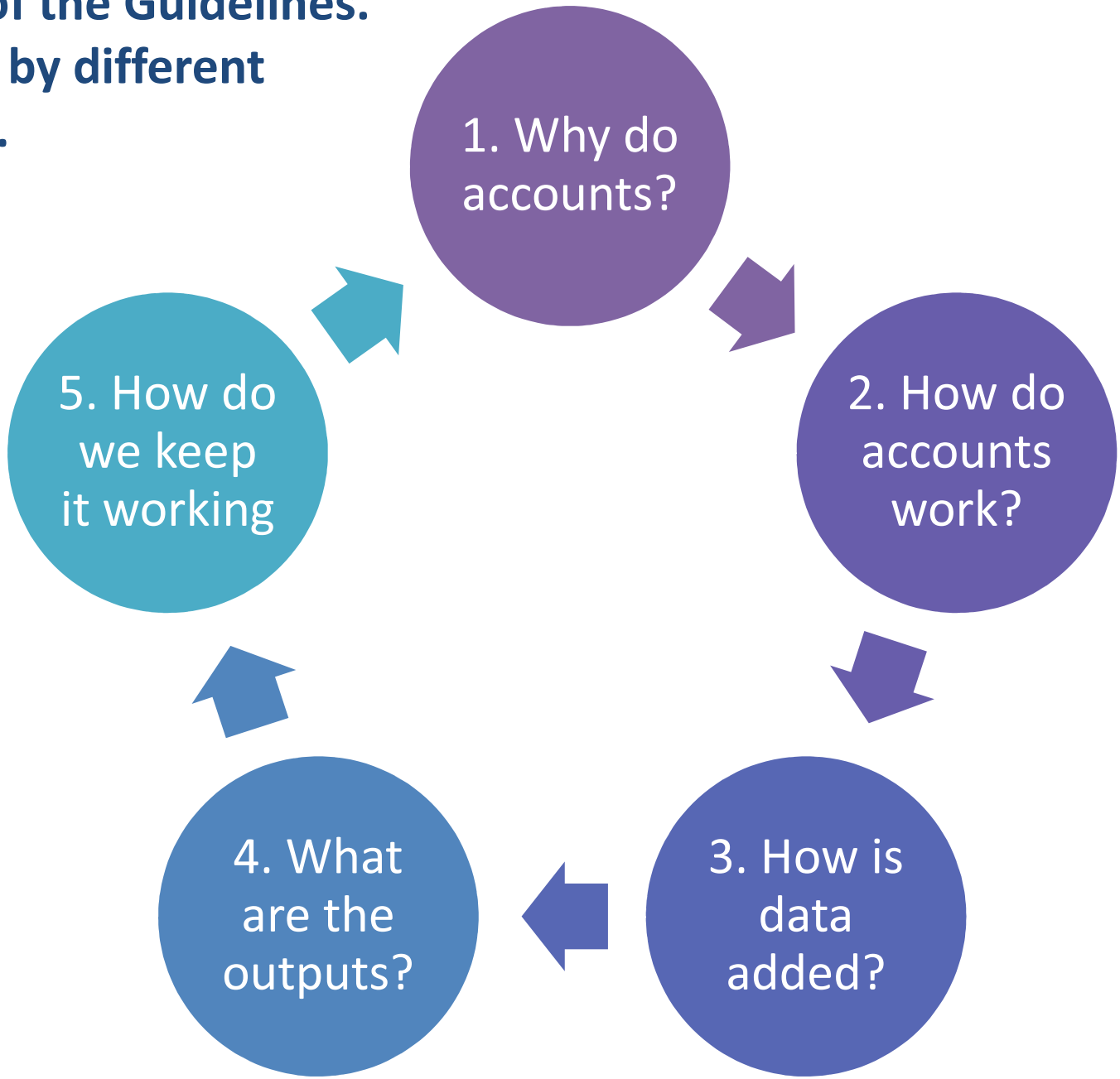
The implementation strategy for the SEEA-Water was adopted by the UN Statistical Commission in 2008. It comprises the following components:

- **Development of the IRWS (adopted in 2010)**
- **Development of training and promotion materials**
- **Development of a technical cooperation program consisting of regional activities as well as pilot projects in selected countries in various regions.**
- **Harmonization of international data collection activities with the SEEA-Water concepts and definitions.**

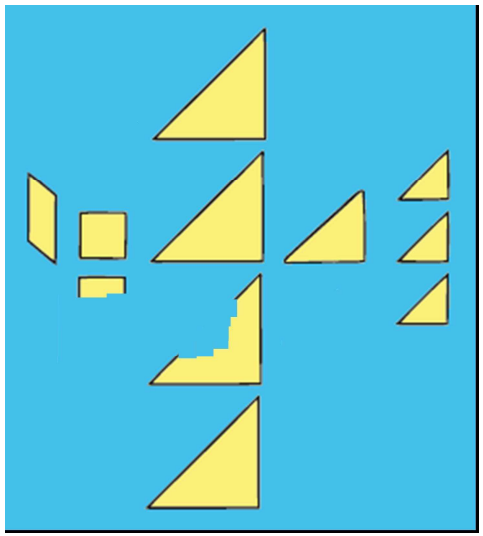
The Guidelines for Water Accounts are an important component of the implementation strategy for the SEEA-Water.

Guidelines for Water Accounts

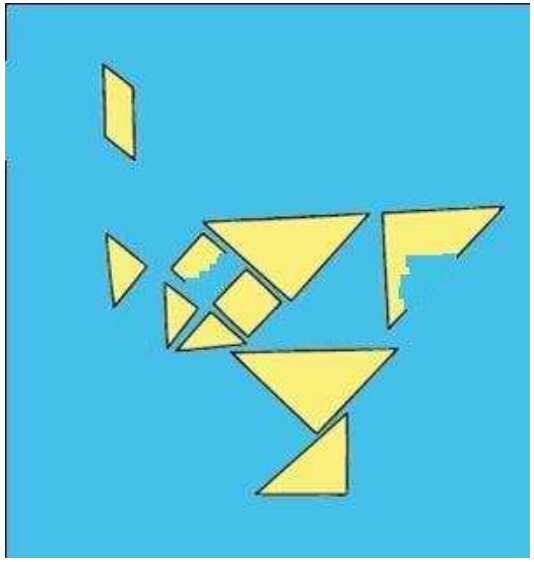
Chapters of the Guidelines. Questions by different audiences.



The data required is usually incomplete, but provides elements for developing an integrated picture.



Sectoral Data



Integrated information

Integrating sectoral data for generating information detonates a virtuous cycle for data improvement.

Paleontology and anthropology provide a good example of how a virtuous cycle is created when relevant information to users is generated. The famous "Lucy" generated income for Ethiopia, anthropology, paleontology, and museums. Lucy is the result of interdisciplinary work.

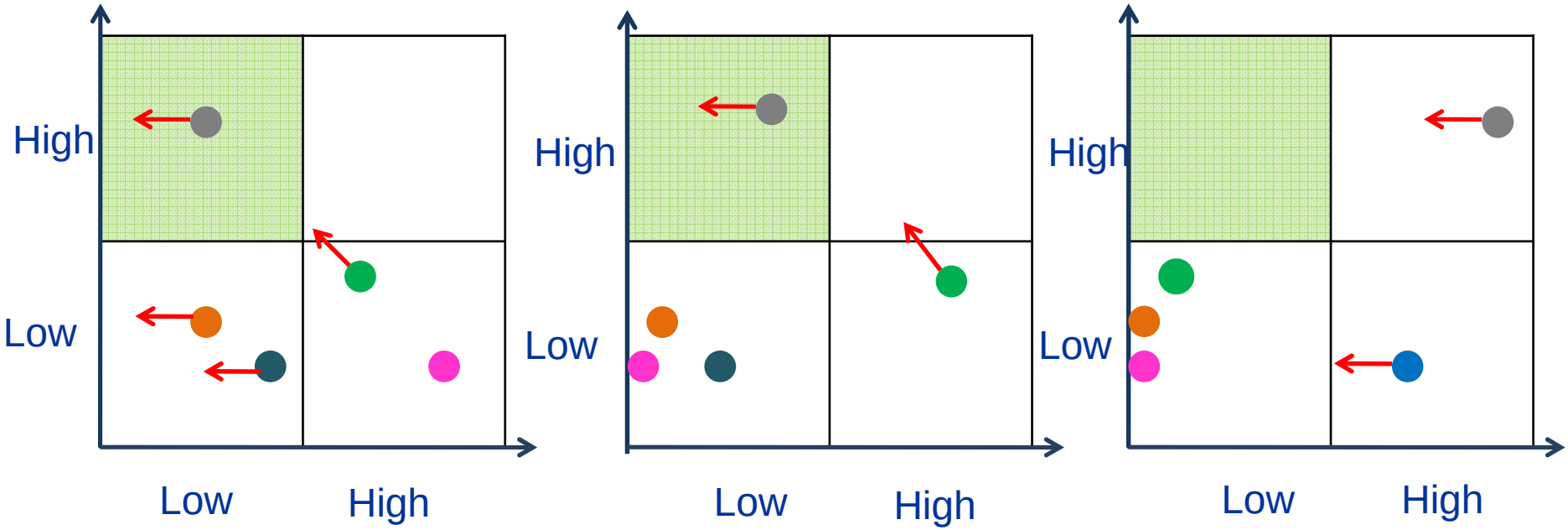
Bones

Lucy

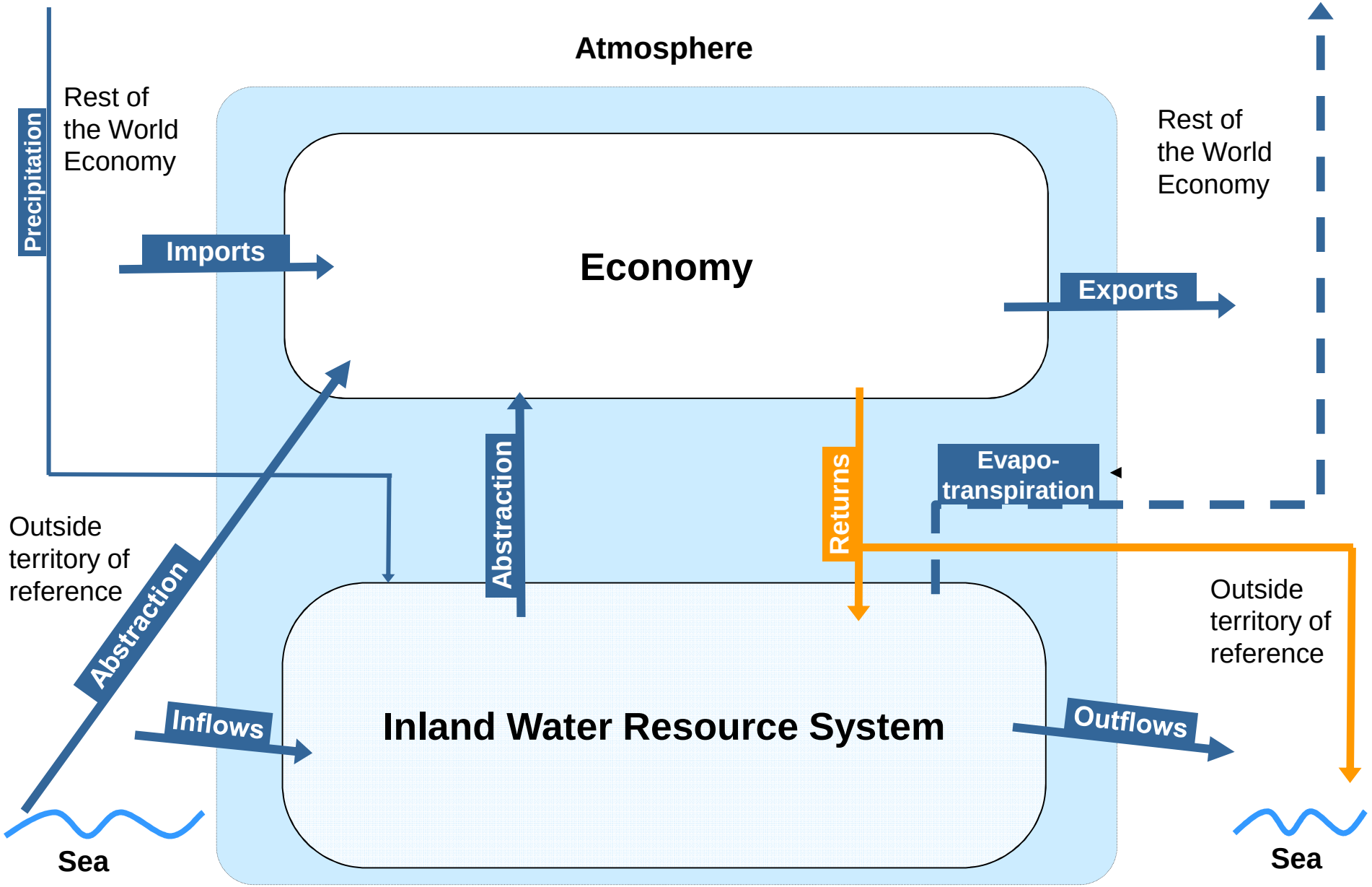
Data, even when scarce, should generate information, which in turn creates the demand for more and better data.

Water efficiency and decoupling is multidimensional. Three aspects impacting water use are shown below:

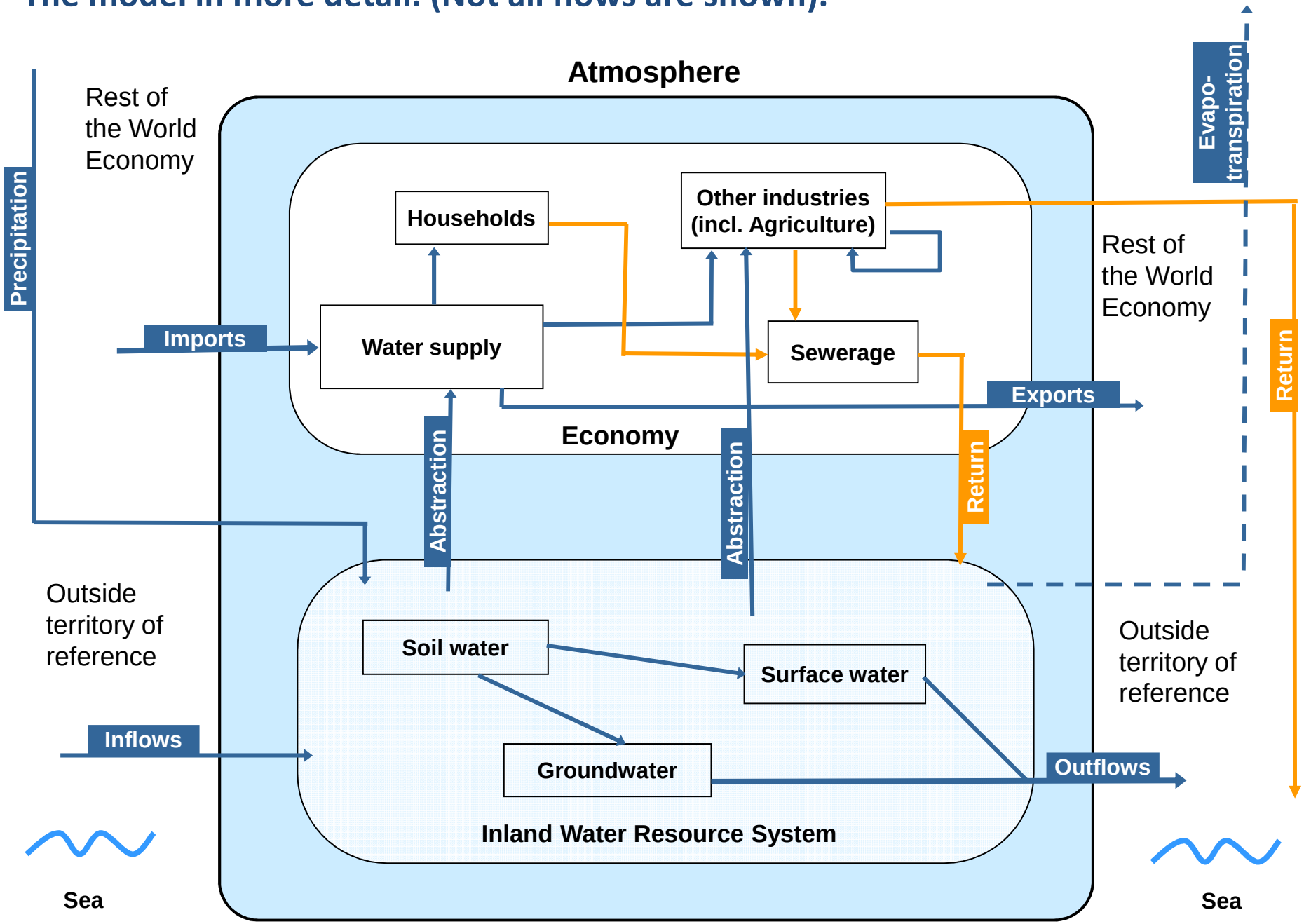
Value added



The SEEA-Water is based on a model made of two subsystems: the economy and inland water resources. (Not all flows are shown in the figure).

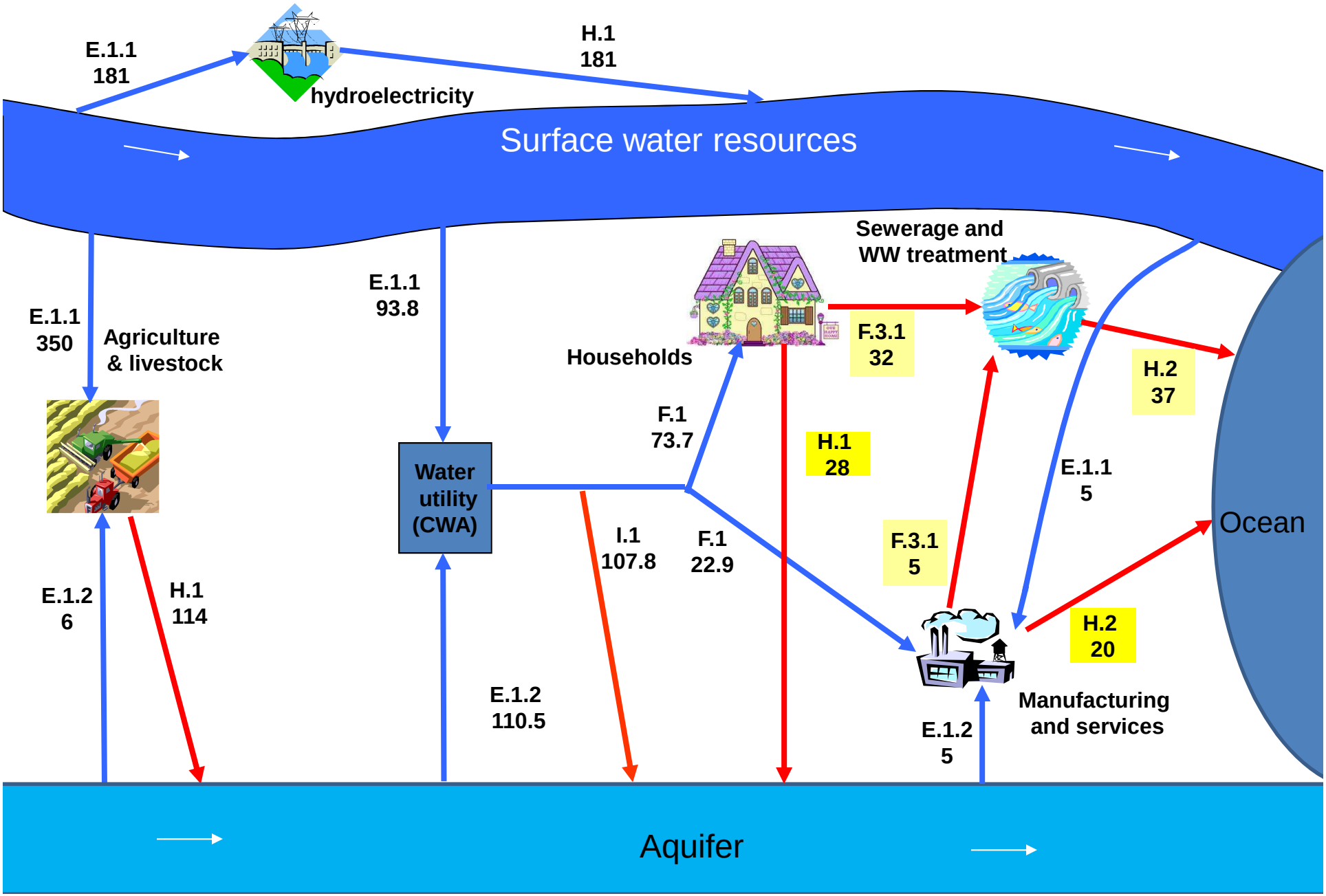


The model in more detail. (Not all flows are shown).



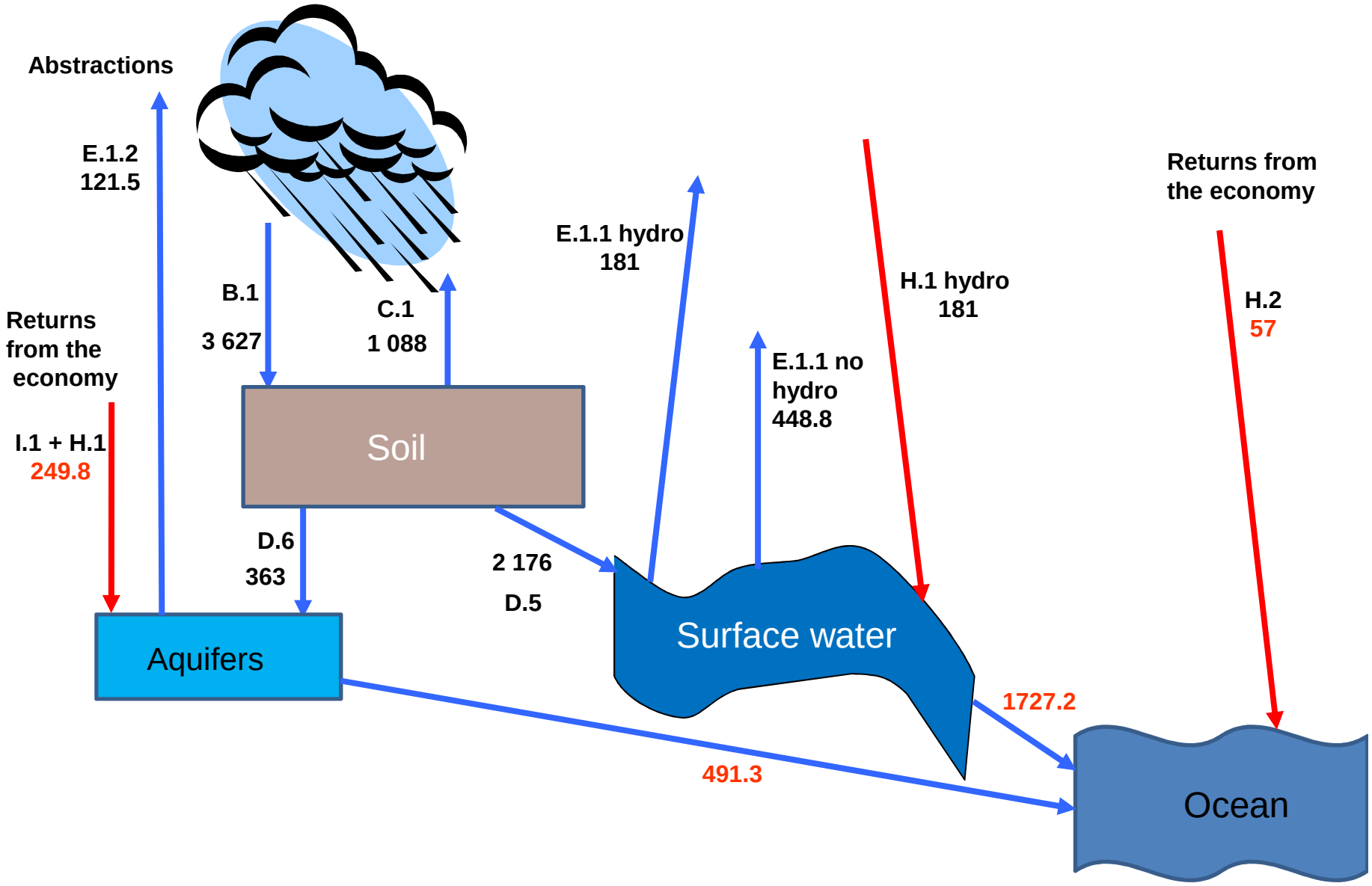
Mauritius. Water flows in the economy 2011. “Friendly diagrams”

Flows of water in million cubic meters per year (hm3/year).



Mauritius. Water flows to and from inland water resources

Flows of water in million cubic meters (hm3). Year 2011



NOTE: **Red numbers** **are rough estimates or balancing numbers.**

Information can be presented in tables. Physical supply and use tables Flows of water in million cubic meters (hm3).

		ISIC 01-03	ISIC 05-33, 41-43,38,39,45-99	ISIC 3510	ISIC 3510	ISIC 3600-2	ISIC 3700			
	SUPPLY	Agriculture and livestock	Manufacture and services	Hydroelectricity	Cooling (thermoelectricity)	Water utility (drinking water)	Sewerage (sewage collection and treatment)	House-holds	Environment to Economy	TOTAL
inputs	Surface water								629.8	629
inputs	Groundwater								121.5	121
000	Drinking water					96.6				96
ils	Losses of water					107.8				107
ils	Sewage to sewers		5					32		
ils	Sewage to environment							28		
ils	Treated wastewater		20				37			
ils	Water returns	114		181						29
ils	Evaporation, transpiration, incorporation in products	242	7.9	0	0	0	0	13.7		263
	TOTAL	**356**	**32.9**	**181**	**0**	**204.4**	**37**	**73.7**	751	1 6

		ISIC 01-03	ISIC 05-33, 41-43,38,39,45-99	ISIC 3510	ISIC 3510	ISIC 3600-2	ISIC 3700			
	USE	Agriculture and livestock	Manufacture and services	Hydroelectricity	Cooling (thermoelectricity)	Water utility (drinking water)	Sewerage (sewage collection and treatment)	House-holds	Economy to Environment	TOTAL
inputs	Surface water	**350**	5	181	0	93.8				629
inputs	Groundwater	6	5	0	0	110.5				121
000	Drinking water		22.9					73.7		96
ils	Losses of water								107.8	107
ils	Sewage to sewers						37		0	
ils	Sewage to environment								28	
ils	Treated wastewater								57	
ils	Water returns								295	2

Monetary supply and use tables
Monetary flows in billion Rupees.

		1	2	3	4	5	6	7
		ISIC 01-03 except 0114	ISIC 1072	ISIC 05-33 except 1072	ISIC 45-99	ISIC 3510	ISIC 3600	ISIC 3700
	SUPPLY (at basic prices)	Agriculture excluding sugar cane	Sugar milling	Mining and manufacturing, exc. Sugar	Services	Electricity	Water	Sewerage
-04	Agricultural products	14.5		2.5				
5	Sugar		8.1	0.17				
-16, 21-54 except 235	Minerals and manufactured goods, exc sugar			132.892	0.2	0	0	0
-99 except 94110	Services			4.7	210.1			
100	Electricity					11.1		
000	Water						1	
110	Sewerage							0.8
		14.5	**8.1**	**140.262**	**210.3**	**11.1**	**1**	**0.8**

		1	2	3	4	5	6	7
		ISIC 01-03 except 0114	ISIC 1072	ISIC 05-33 except 1072	ISIC 45-99	ISIC 3510	ISIC 3600	ISIC 3700
	USE (at purchaser's prices)	Agriculture excluding sugar cane	Sugar milling	Mining and manufacturing, exc. Sugar	Services	Electricity	Water	Sewerage
-04	Agricultural products	1.5	6.3	5.1	2.2	0.26		
5	Sugar			0.27	0.9	0		
-16, 21-54 except 235	Minerals and manufactured goods, exc sugar	0.95	0.6	67.91	23.315	4.14	0.1	0.03
-99 except 94110	Services	2.21		10.3	42.5	0.74	0.1	0.1
100	Electricity	0.03	0.085	1.94	2.9	3.5	0.1	0.02
000	Water			0.16	0.8			
110	Sewerage			0.14	0.7	0	0	
		4.69	**6.985**	**85.82**	**73.315**	**8.64**	**0.3**	**0.15**
	Gross value added at basic prices	**9.81**	**1.115**	**54.442**	**136.985**	**2.46**	**0.7**	**0.65**

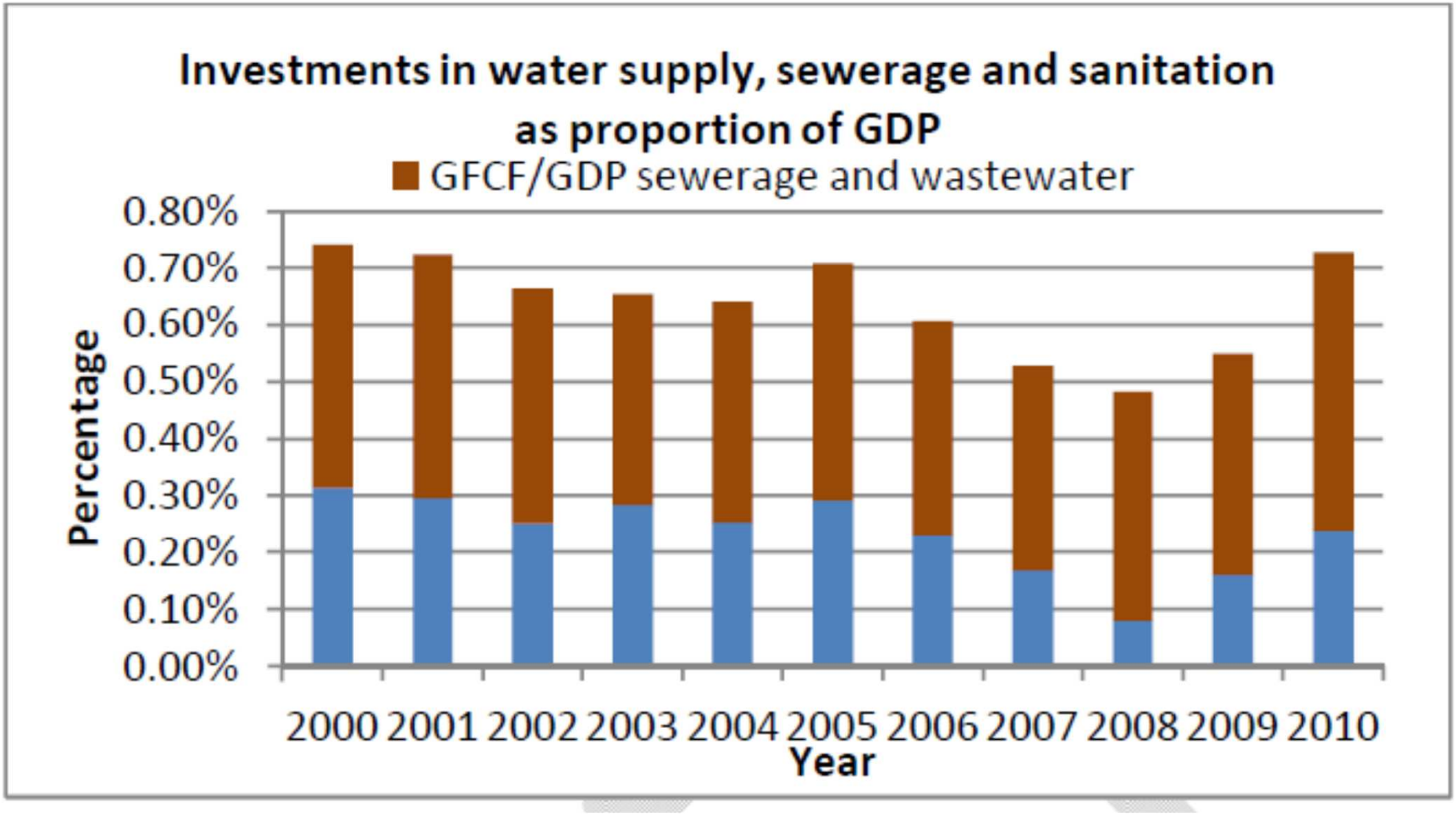
Time series can be developed with the data, according to standardized criteria.

	DATA ITEM	UNITS	2008	2009	2010	2011
1	**Contextual Information**					
2	Mid-year population of the country (1st July)	inhabitants	1 230 995	1 237 283	1 243 084	1 248 126
3	Land area (only island of Mauritius)	km^2	1,865	1,865	1,865	1,865
4	26. Land area irrigated	ha	21,457	21,543	19,847	19,885
5	Irrigated area converted to square kilometers	km2	215	215	198	199
6	Electric energy generated	GWh/year	2,557	2,577	2,689	2,730
7	Hydroelectricity generated	GWh/year	108	122	101	57
8	**Hydrologic Information (with IRWS code)**					
9	B.1. Precipitation. In volume	hm^3/year	4 440	4 457	3 368	3 627
10	C.1. Evapotranspiration from inland water resources	hm^3/year	1,332	1,337	1,010	1,088
11	B.1.a. Surface runoff	hm^3/year	2,664	2,674	2,021	2,176
12	D.6.Aquifer recharge	hm^3/year	444	446	337	363
13	B.2 Inflow from neighbouring territories	hm^3/year	0	0	0	0
14	C.2.1 Outflow to neighbouring territories	hm^3/year	0	0	0	0
15	C.2.2. Outflow to the sea	hm^3/year	1,870	1,870	1,870	1,900
16	1.1 Number of large artificial reservoirs	units	10	10	10	10

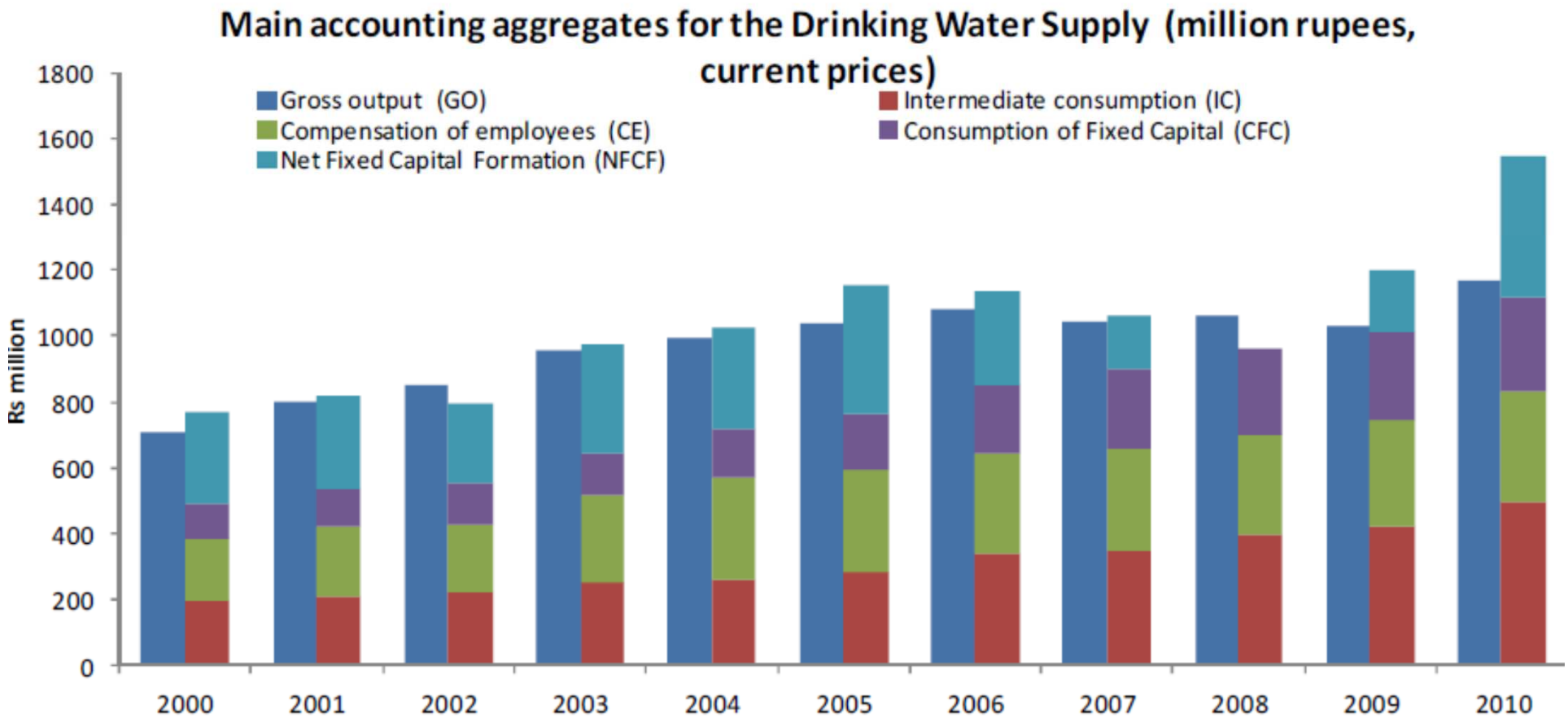
With the data different indicators can be calculated (Mauritius)

	INDICATOR OR INTERMEDIATE DERIVED DATA	UNITS	LONG TERM AVERAGE	2005	2006	2007
1	**Contextual Information**					
2	Population density	inhab/km^2	0	647	652	6
3	Hydroelectricity as proportion of energy generated	%	#DIV/0!	5%	3%	3
4	Electricity generated per capita	kWh/inhab	#DIV/0!	1,883	1,933	2,0
5	**Hydrologic Information**					
6	Precipitation in height	mm/year	2 011	2 492	1 915	1 9
7	Evapotranspiration as proportion of precipitation	%	30%	30%	30%	30
8	Internal Renewable Water Resources (IRWR)	hm^3/year	2,625	3,253	2,500	2,5
9	Total Renewable Water Resources (TRWR)	hm^3/year	2,625	3,253	2,500	2,5
10	Dependency ratio	%	0%	0%	0%	0
11	Total Renewable Water Resources per capita	m3/inhab/yr	#DIV/0!	2,696	2,056	2,0
12	Artificial reservoir capacity as proportion of surface runoff and inflows from neighbouring countries	%	0%	3%	4%	4
13	Artificial reservoir capacity per capita	m3/inhab	#DIV/0!	75	75	
14	**Water in the economy**					
15	Total water abstracted (only off-stream)	hm^3/year	0	660	639	6
16	Water abstracted per capita (only off-stream)	m^3/inhab/year	#DIV/0!	547	525	5
17	Water abstraction as proportion of TRWR (MDG 7.5)	%	0%	20%	26%	24
18	Water abstracted for drinking water per capita	L/inhab/day	#DIV/0!	410	389	4

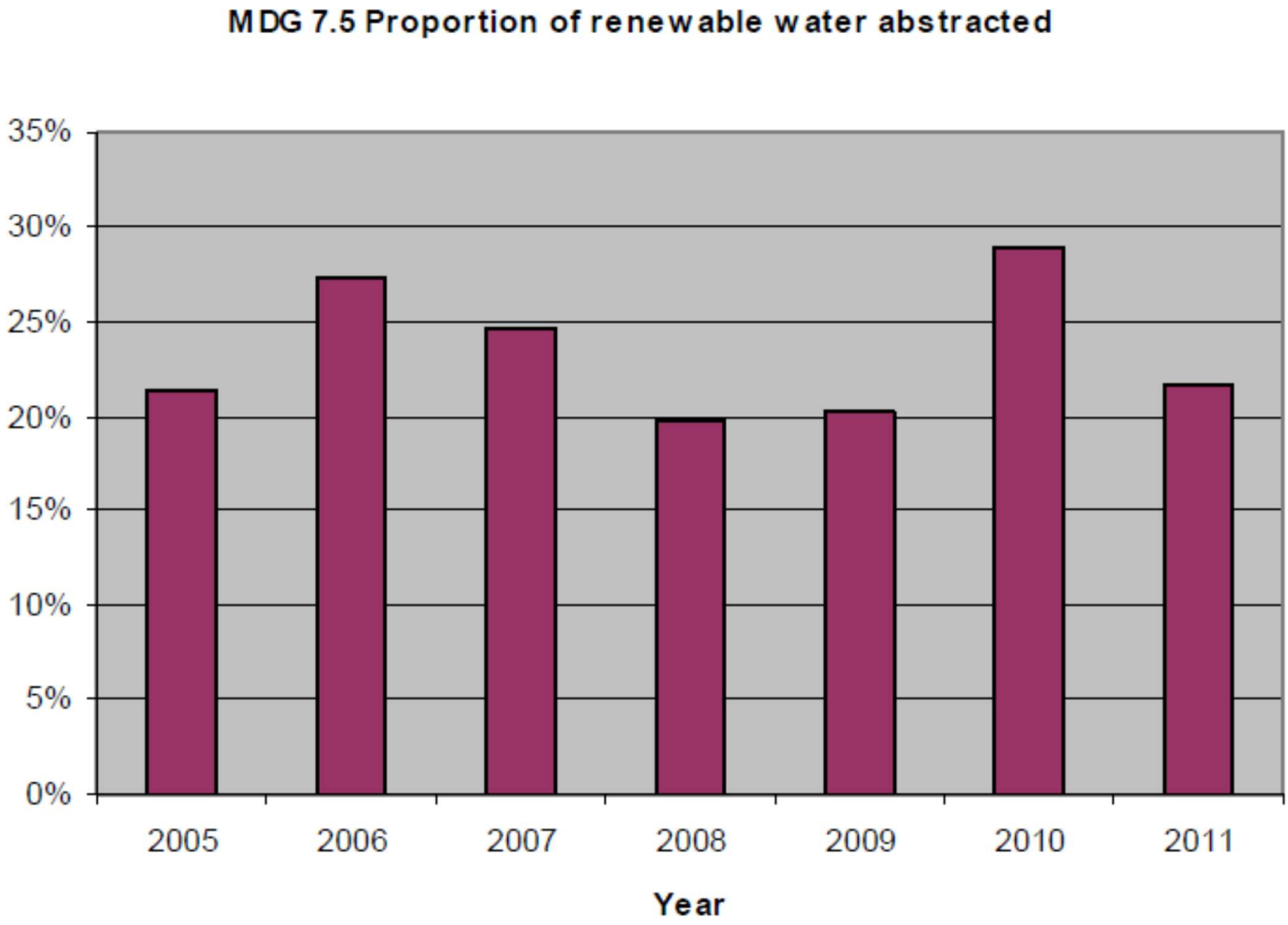
Times series with information from the accounts.



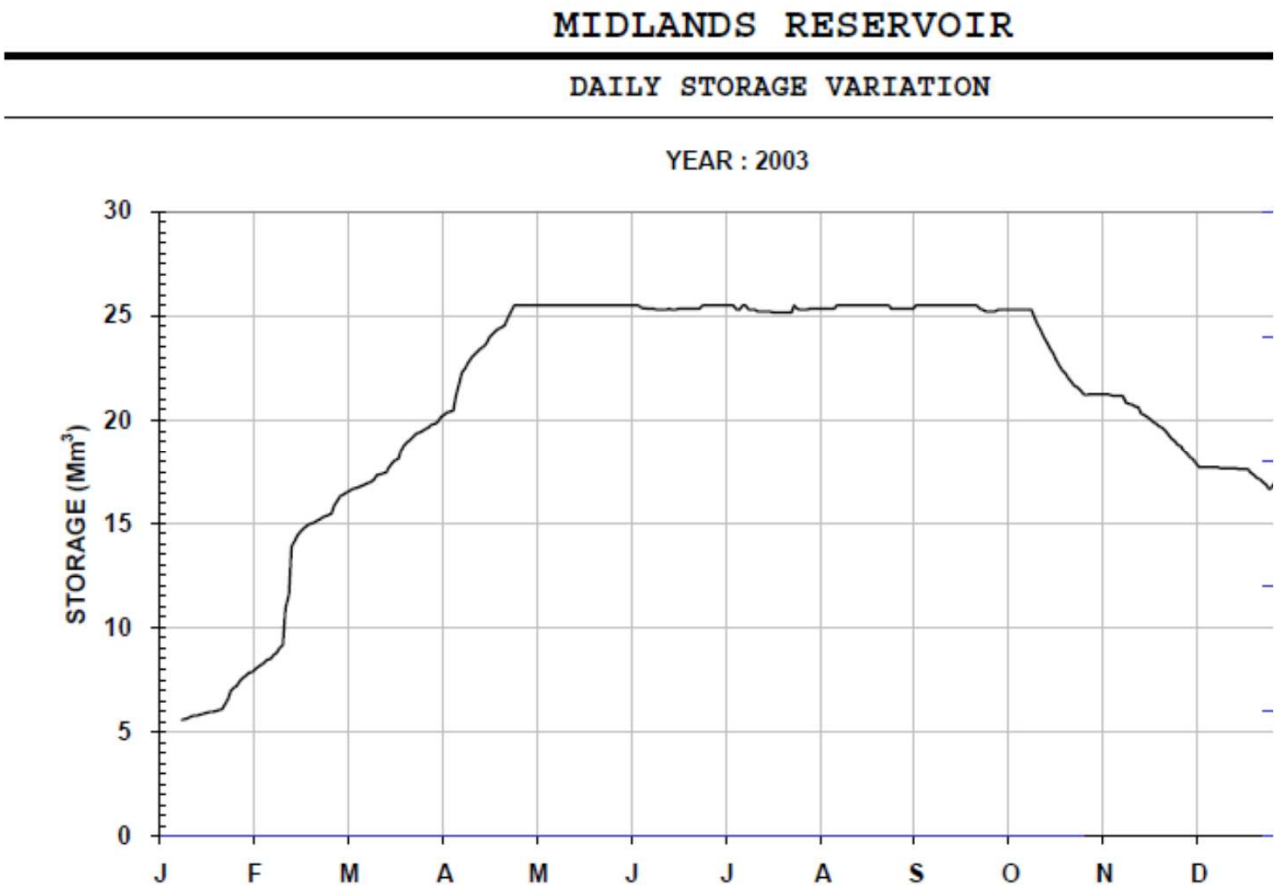
Times series with information from the accounts.



Times series with information from the accounts.

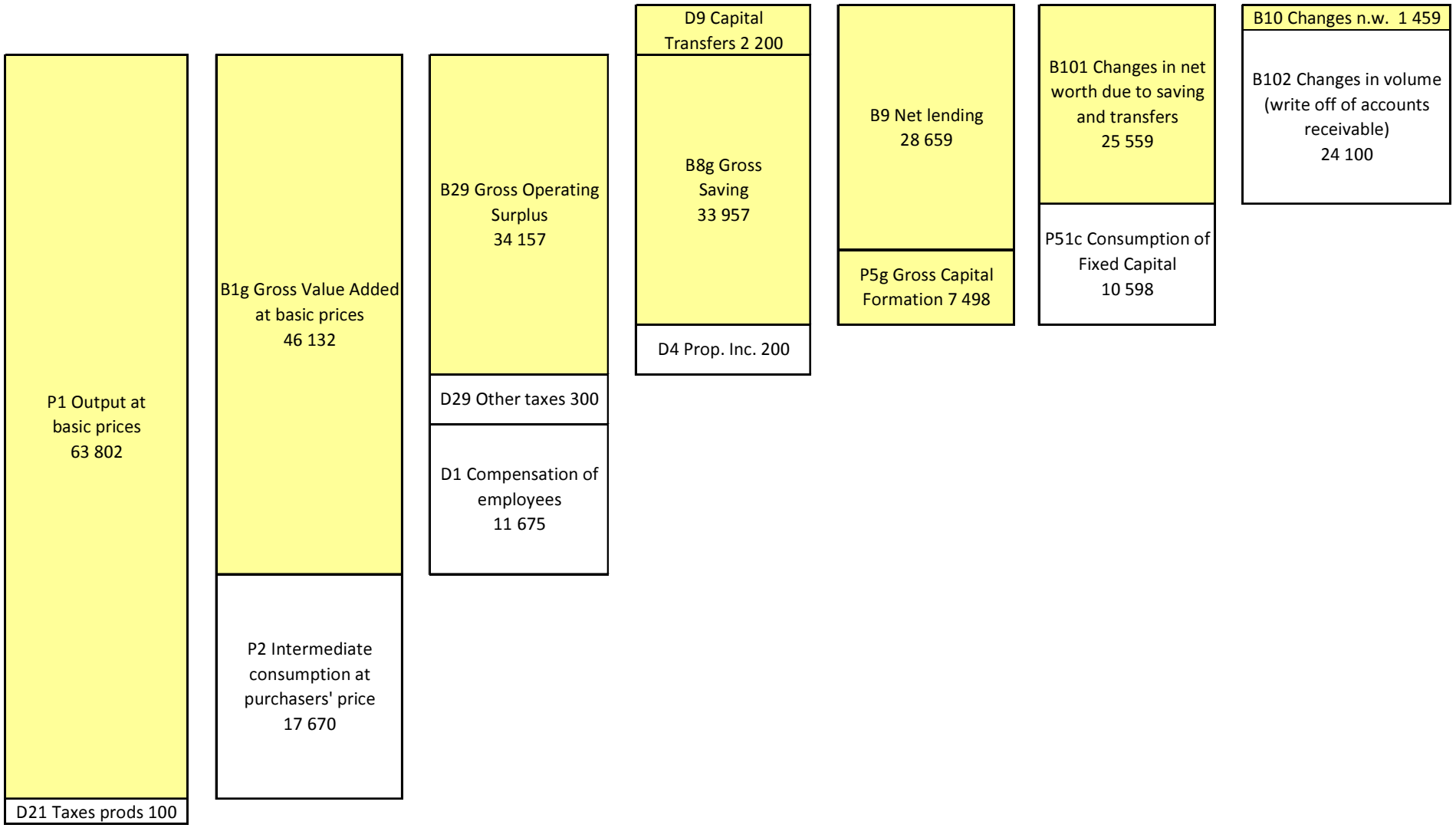


Example: Artificial reservoir ("Midlands") in Mauritius, showing monthly variations in water storage.



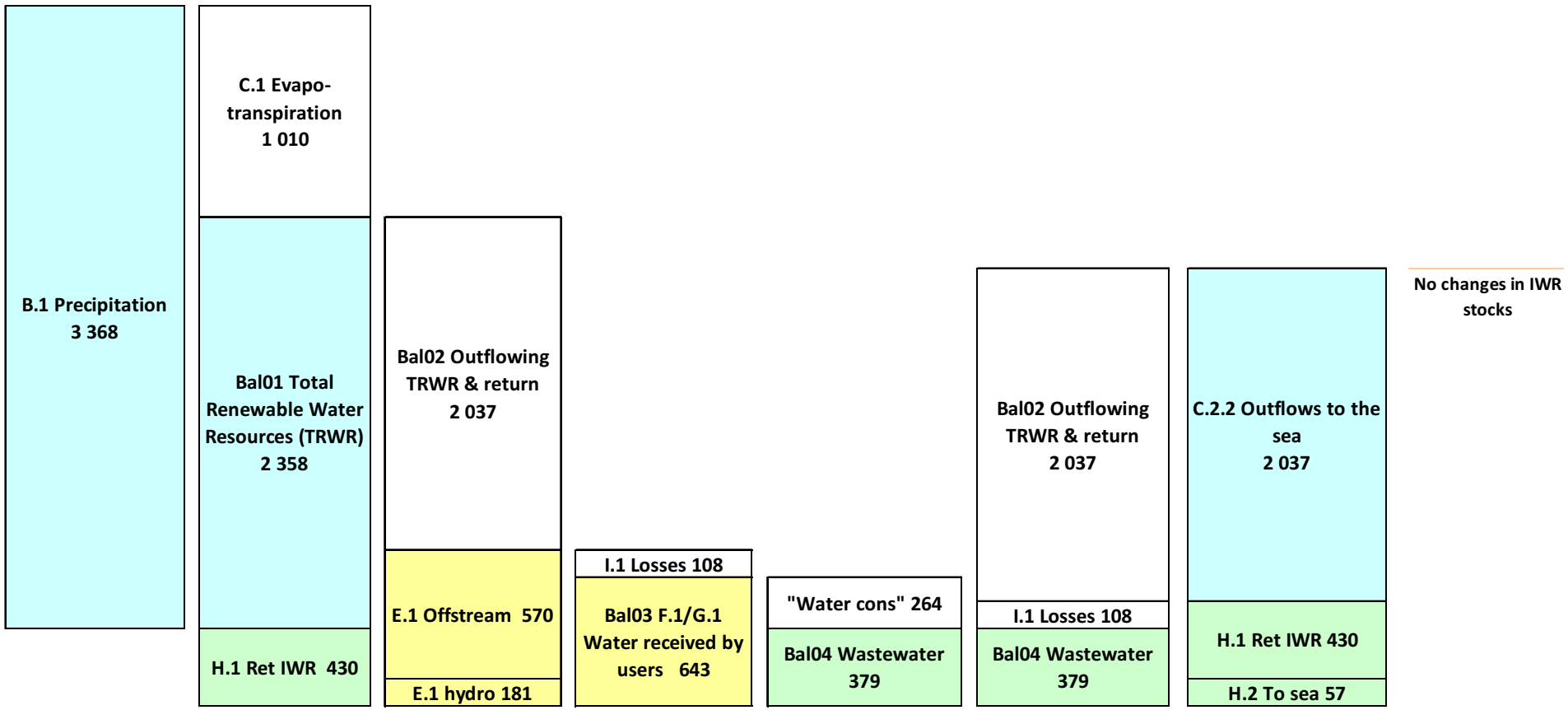
The graph shows that the reservoir is unable to regulate the seasonal rainfall variations.

Example: Sequence of accounts in water and wastewater services (monetary units)



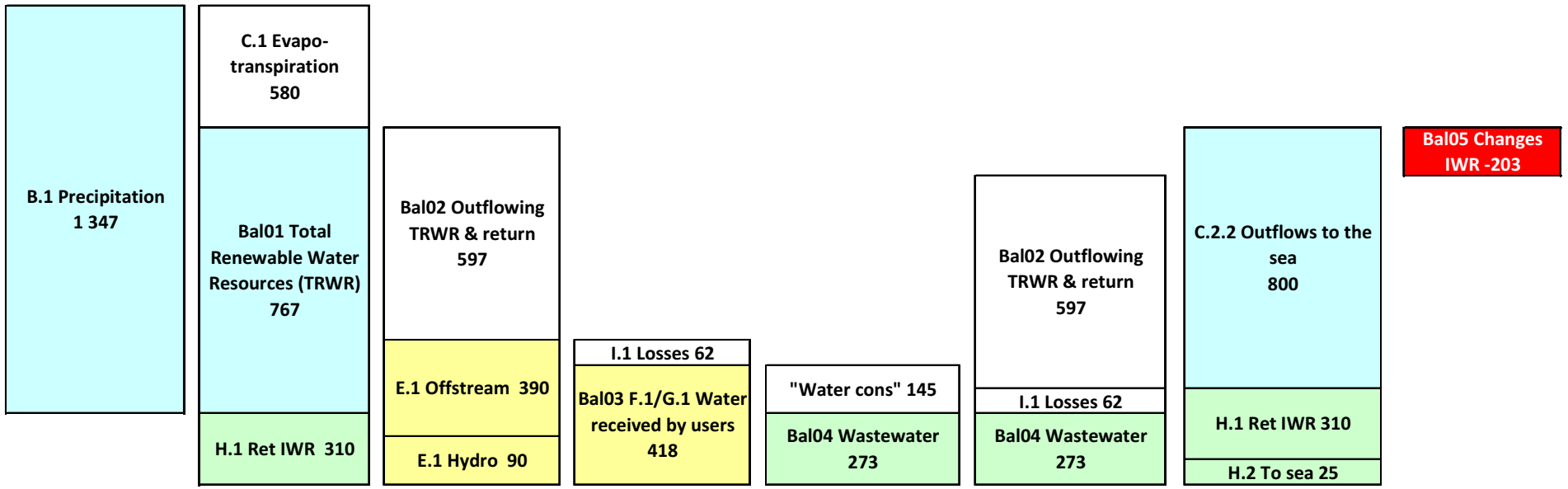
The sequence shows that there is an accumulation of monetary flows of 1 459 for the following year.

Example: Sequence of water flows (volumes of water in one year)



The sequence shows the proportions of renewable water and abstractions.

Example: Sequence of water flows, half of the year (volumes of water in half a year)



The sequence shows the changes in the stocks of inland water resources. Need of storage.

Coordination

Assembling an integrated picture of water requires collaboration among different organizations, at the national and international level.

Some key international partners are the following:

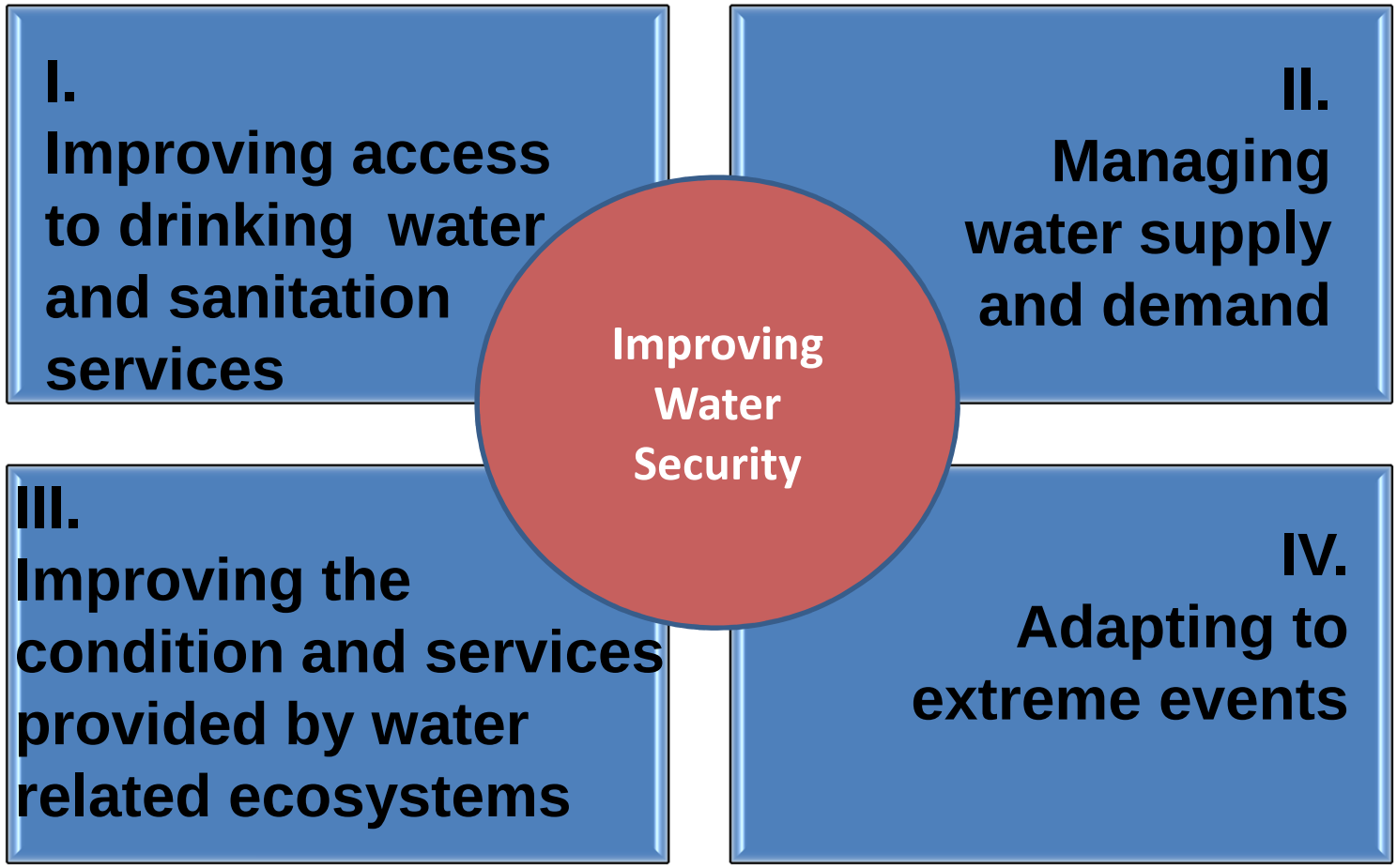
- **GLAAS, tracking financial flows for water and sanitation.**
- **OECD-Eurostat questionnaire, collecting data from countries**
- **UNSD-UNEP questionnaire, collecting data from countries**
- **FAO-Aquastat, performing surveys**

The SEEA-Water and IRWS provide a coherent framework to harmonize the data collection initiatives.

Thank you!

Ricardo MARTINEZ-LAGUNES (martinezr@un.org)

Organizing the information from SEEA-Water



Quadrant I and indicators

I. Improving access to drinking water and sanitation services

- Number of people with access to improved water and sanitation.
- Monetary flows related to drinking water supply and sewerage services.
- Volume of water abstracted, distributed and lost in distribution.

Quadrant II and indicators

II. Managing water supply and demand

- Renewable inland water resources
- Water abstracted /consumed/ returned by economic activities.
- Water productivity by economic activity.
- Amount of wastewater generated, proportion that is treated, and proportion that is reused.
- Waterborne pollutants released by the different economic activities. Pollution removed.

Quadrant III and indicators

III.
Improving the condition and services by ecosystems

- Water quality assessments in watercourses
- Measures of the health of the water ecosystems.
- Actual renewable water resources based on the ecosystem carrying capacity and regulating services.
- Ecosystem carrying capacity to absorb the different type of pollutants.
- River fragmentation indicators.
- Wetland extent.
- Environmental flows.
- Mean species abundance.

Quadrant IV and indicators

IV.
Adapting to extreme events

- Economic losses due to hydro-meteorological events.
- Proportion of population at risk of floods.
- Proportion of population at risk of droughts.
- Loss of life from water-related disasters