Recap

Let's take 5 minutes to write:

What is your main takeaway from our first day?

One question you have for the first day.

Overview of water accounts

Sokol Vako

United Nations Statistical Institute for Asia and the Pacific

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UNITED NATIONS SIAP Statistical Institute for Asia and the Pacific

What are we measuring and why

What?

- Availability (stocks) and changes (flows) of water resources
- Supply and use of water within the economy

Why?

- Policies on water security, water resources management
- Links to economic accounts
- Links to ecosystem condition and services
- Indicators (including SDGs), e.g.
  - Total water use (by source, purpose, etc.)
  - Water intensity/productivity
  - Variability in water resources, trends (droughts, floods)

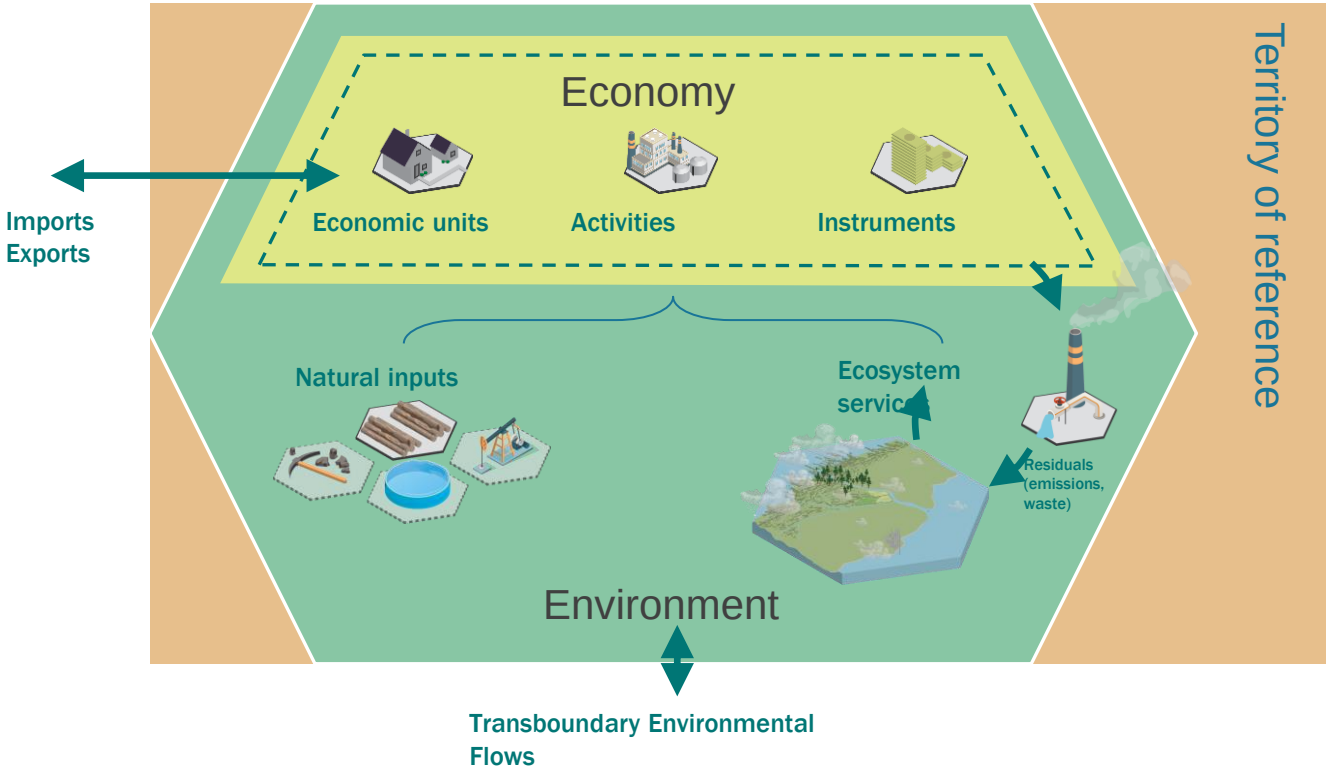
What should producers of water accounts

1. Knowing user needs
2. Conceptual understanding of water stocks and flows
3. Familiar with terms, definitions and classifications
4. Availability of basic water statistics and monetary data items
5. Understanding of main accounting principles
6. Understanding of structure of the water accounting tables.

What should producers of water accounts

1. Knowing user needs—Lets take 2 minutes to write down what you think are 2 water related data/aggregate/indicators that are highly relevant for Bhutan

Let's recall the framework



Water assets—Some definitions

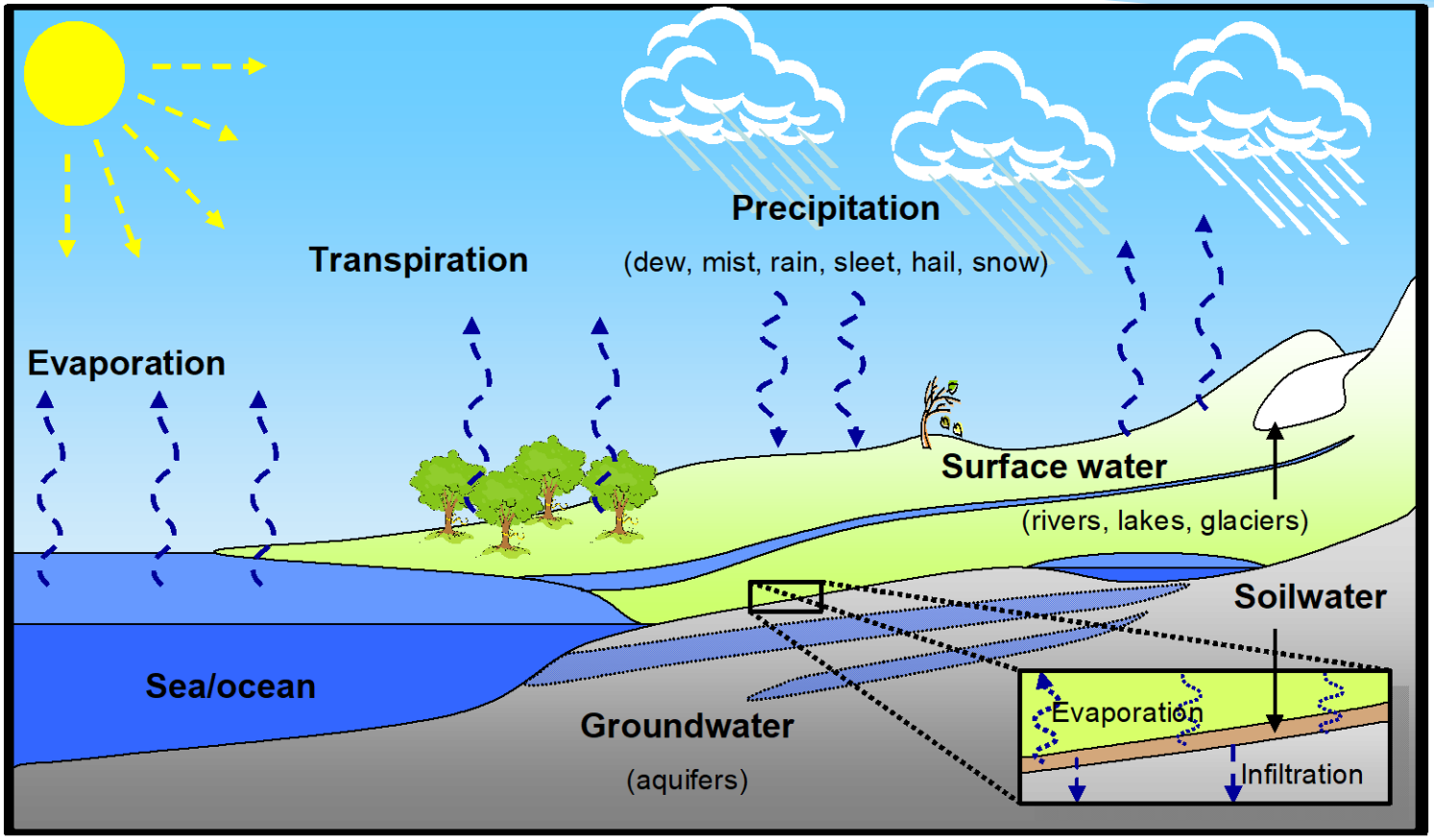
Environmental assets are the naturally occurring living and non-living components of the Earth, together constituting the biophysical environment, which may provide benefits to humanity.

Water resources consist of fresh and brackish water in inland water bodies, including groundwater and soil water.

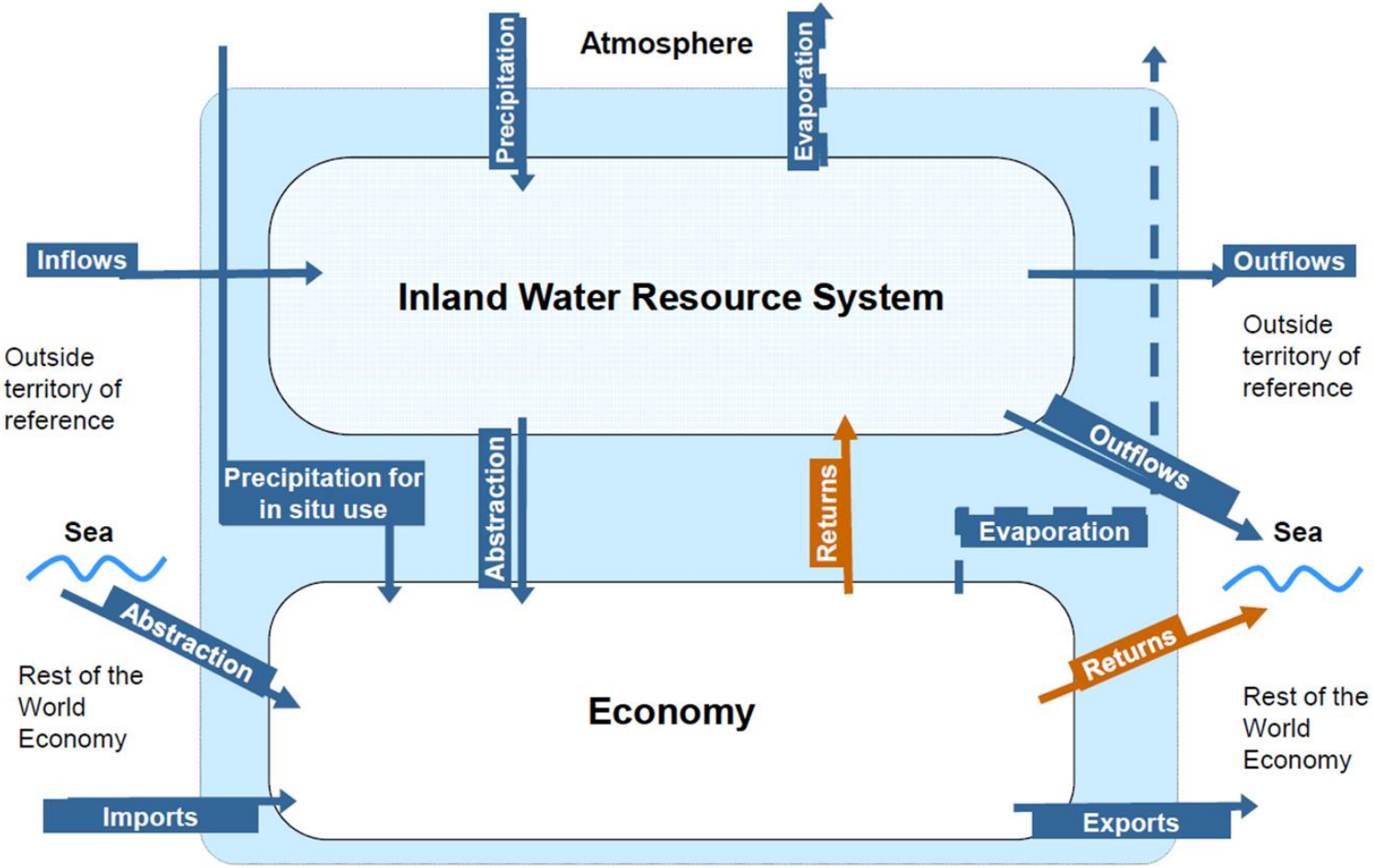
Classification of inland water bodies

Inland water bodies	
1	Surface water
1.1	Artificial reservoirs
1.2	Lakes
1.3	Rivers and streams
1.4	Glaciers, snow and ice
2	Groundwater
3	Soil water

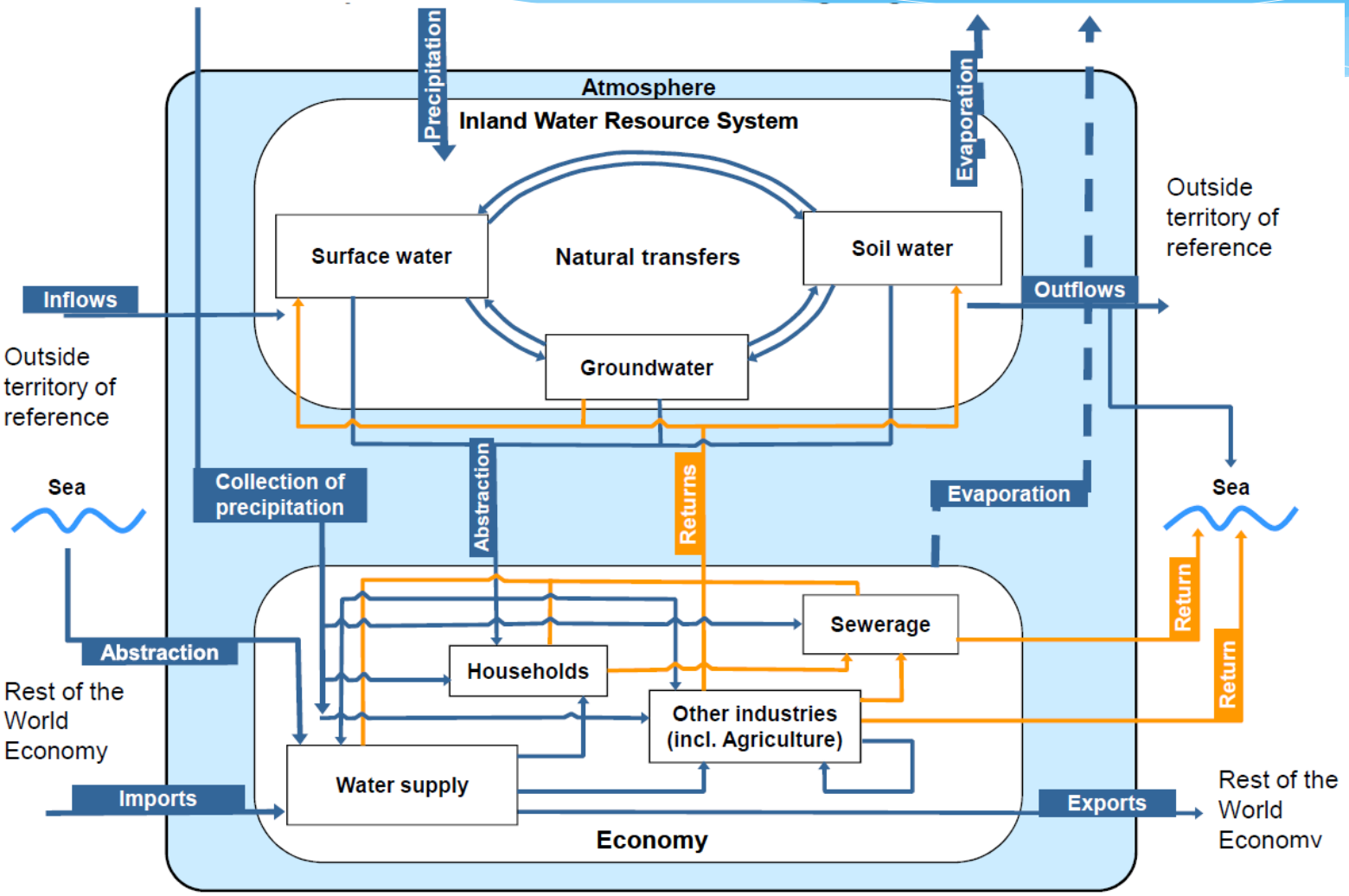
Water assets and hydrological cycle



Simplified Water Stocks and Flows



More Details on Water Stocks and Flows

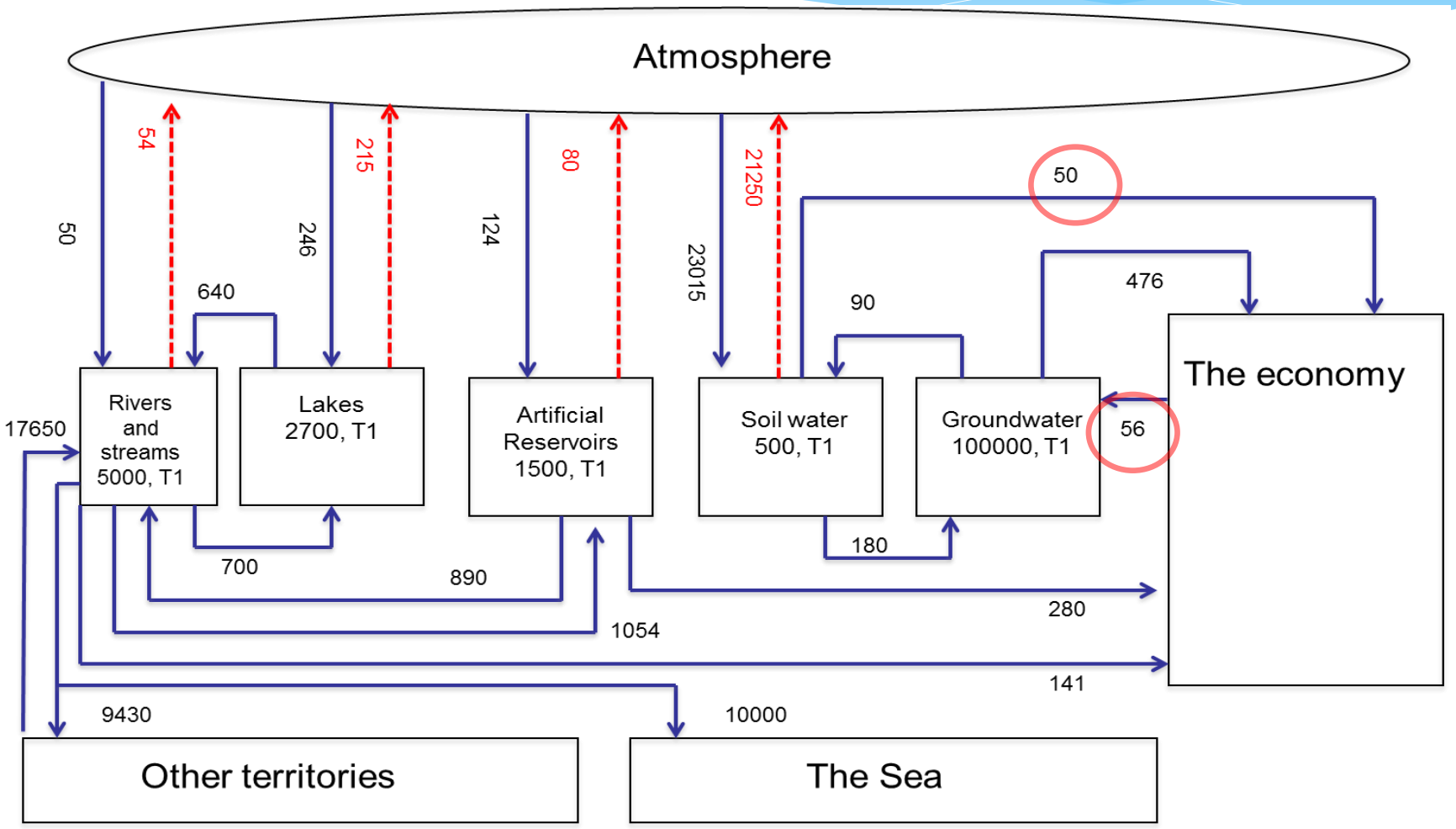


* What are some of the most important water assets in Bhutan?
* Which industries use the most water?

General structure of water asset account

	Type of water resource						Total
	Surface water				Groundwater	Soil water	
	Artificial reservoirs	Lakes	Rivers and streams	Glaciers, snow and ice			
Opening stock of water resources							
Additions to stock							
Returns							
Precipitation							
Inflows from other territories							
Inflows from other inland water resources							
Discoveries of water in aquifers							
Total additions to stock							
Reductions in stock							
Abstraction							
for hydro power generation							
for cooling water							
Evaporation & actual evapotranspiration							
Outflows to other territores							
Outflows to the sea							
Outflows to other inland water resources							
Total reductions in stock							
Closing stock of water resources							

An example


Atmosphere
50
54
215
246
124
80
23015
21250
50
640
90
476
17650
Rivers and streams 5000, T1
Lakes 2700, T1
Artificial Reservoirs 1500, T1
Soil water 500, T1
Groundwater 100000, T1
56
The economy
700
890
180
280
1054
141
9430
10000
Other territories
The Sea

An example

	Type of water resources						
			Surface water				
	Artificial reservoirs	Lakes	Rivers and streams	Glaciers, snow and ice	Goundwater	Soil water	**Total**
(A) Opening stock	**1,500**	**2,700**	**5,000**	-	**100,000**	**500**	**109,700**
Additions to stock							
(B) Returns (from Economy)	-	-	-	-	56	-	**56**
(C) Precipitation	124	246	50	-		23,015	**23,435**
(D) Inflows from other territories	-	-	17,650	-	-		**17,650**
(E) Inflows from other inland water	1,054	700	640	-	180	90	**2,664**
(F) Discoveries of water in aquifers					-		-
(G) Total additions to stock	*1,178*	*946*	*18,340*	-	*236*	*23,105*	***43,805***
Reductions in stock							
(H) Abstraction (to Economy)	280		141	-	476	50	**947**
(I) Evaporation and evapotranspiration	80	215	54	-		21,250	**21,599**
(J) Outflows to other territories			9,430	-	-		**9,430**
(K) Outflows to the sea			10,000	-	-		**10,000**
(L) Outflows to other inland water	890	640	1,754	-	90	180	**3,554**
(M) Total reductions in stock	*1,250*	*855*	*21,379*	-	*566*	*21,480*	***45,530***
Closing stock	**1,428**		**1,961**		**99,670**	**2,125**	**107,975**

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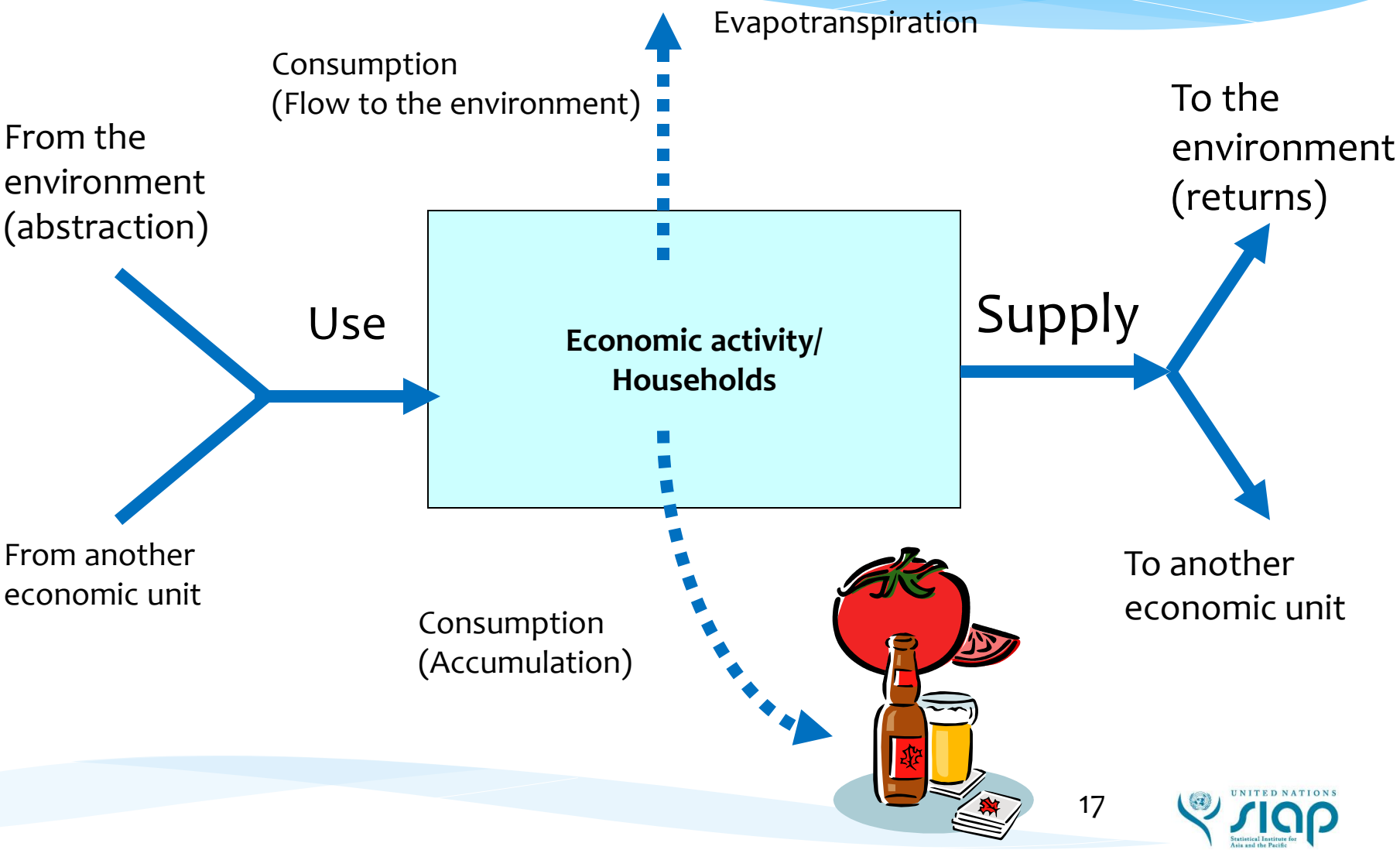
General structure of water supply and use table

PHYSICAL SUPPLY TABLE	Industries (by ISIC)							House-holds	Flows from the Rest of the World (Imports)	Flows from the Environment	TOTAL SUPPLY
	Agriculture, Forestry & Fishery (ISIC A)	Mining, Quarrying and Manufacturing (ISIC B & C)	Electricity, gas, steam & air conditioning supply (ISIC D)	Water collection, treatment & supply (ISIC 36)	Sewerage (ISIC 37)	Other Industries	**Total Industry**				
1. Sources of Abstracted Water:											
Inland Water Resources											
of which: Surface water											
of which: Groundwater											
Other Water Sources											
TOTAL SUPPLY ABSTRACTED WATER											
2. Water:											
For distribution											
For own use											
3. Wastewater and reused water:											
Total Wastewater											
of which: wastewater to treatment											
of which: own treatment											
Reused water produced (for distribution)											
TOTAL WASTEWATER AND REUSED WATER											
4. Return flows of water:											
To inland water resources											
To other sources											
TOTAL RETURN FLOWS											
of which: losses in distribution											
5. Evaporation of abstracted water, transpiration and water incorporated into products:											
TOTAL WATER EVAPORATED, TRANSPIRED AND INCORPORATED INTO PRODUCTS											
6. TOTAL SUPPLY											

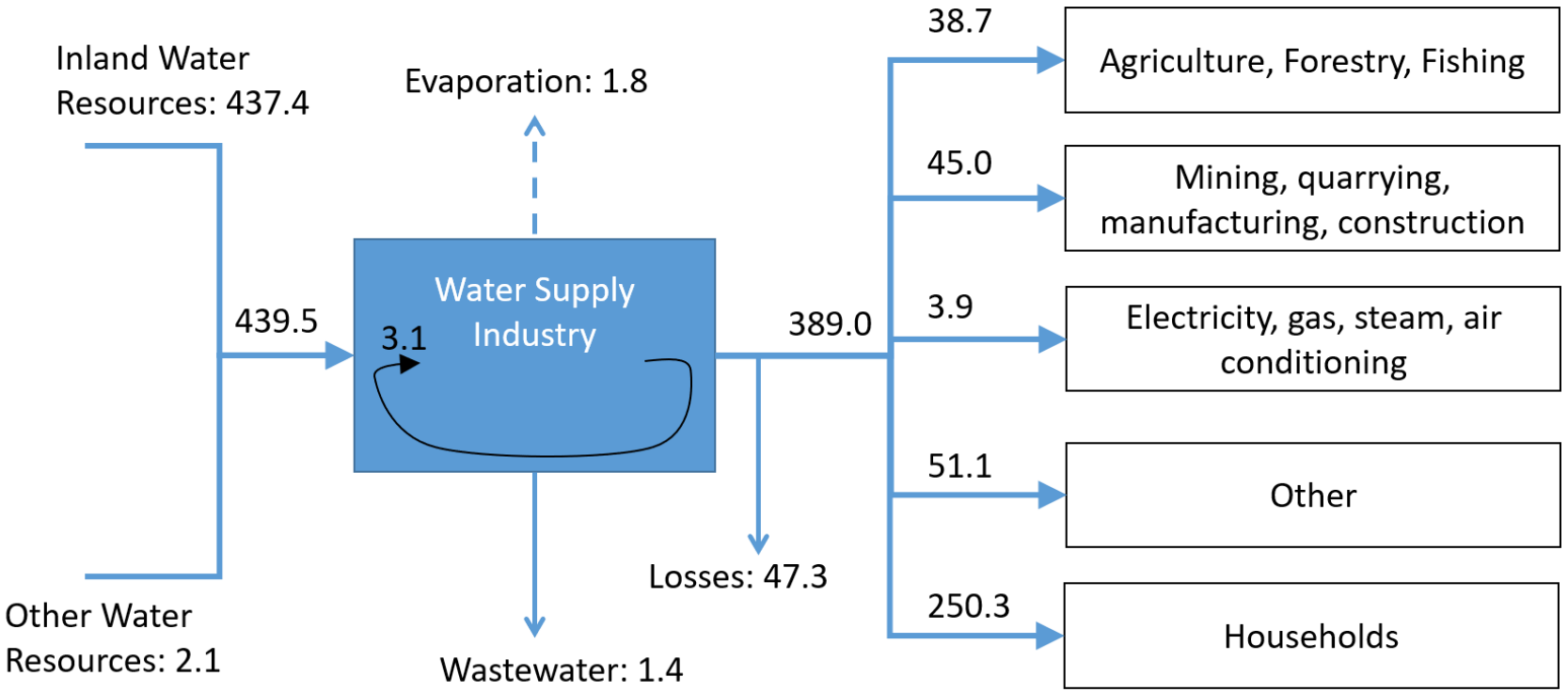
General structure of water supply and use table

PHYSICAL USE TABLE													
1. Sources of Abstracted Water:													
Inland Water Resources													
of which: Surface water													
of which: Groundwater													
Other Water Sources													
TOTAL USE ABSTRACTED WATER													
2. Water (use):													
Distributed water													
Own use of water													
3. Wastewater and reused water:													
Total Wastewater													
of which: wastewater received from other units													
of which: own treatment													
Reused water (distributed reuse)													
TOTAL WASTEWATER AND REUSED WATER													
4. Return flows of water:													
To inland water resources													
To other sources													
TOTAL RETURN FLOWS													
5. Evaporation of abstracted water, transpiration and water incorporated into products:													
TOTAL WATER EVAPORATED, TRANSPIRED AND INCORPORATED INTO PRODUCTS													
6. TOTAL USE													

Measuring water flows



An example


Inland Water Resources: 437.4
Other Water Resources: 2.1
439.5
Evaporation: 1.8
Water Supply Industry
3.1
Wastewater: 1.4
Losses: 47.3
389.0
38.7
Agriculture, Forestry, Fishing
45.0
Mining, quarrying, manufacturing, construction
3.9
Electricity, gas, steam, air conditioning
51.1
Other
250.3
Households

An example-supply

	Abstraction of water; production of water; generation of return flows							RoW		
	01-03	05-33, 41-43	35	36	37	38, 39, 45-99	Households	Imports	Environment	Total supply
(I) Sources of abstracted water										
Inland water resources									966.9	966.9
Other water resources									202.1	202.1
(II) Abstracted water										
For distribution				389.0						389.0
For own-use	108.4	114.6	404.2	3.1	100.1	2.3				732.7
(III) Wastewater and reused water										
Wastewater	17.9	117.6	5.6	1.4		49.1	235.5			427.1
Reused water produced		10			42.7					52.7
(IV) Return flows of water										
To inland water resources	65	23.5	300	47.3	227.5	0.7	4.6			668.6
To other sources		5.9	100		256.3		0.2			362.4
(V) Evaporation of abstracted water, transpiration and water incorporated into products	76.2	43.2	2.5	1.8	0.7	3.6	10			138.0
Total supply	267.5	314.8	812.3	442.6	627.3	55.7	250.3		1169.0	3939.5

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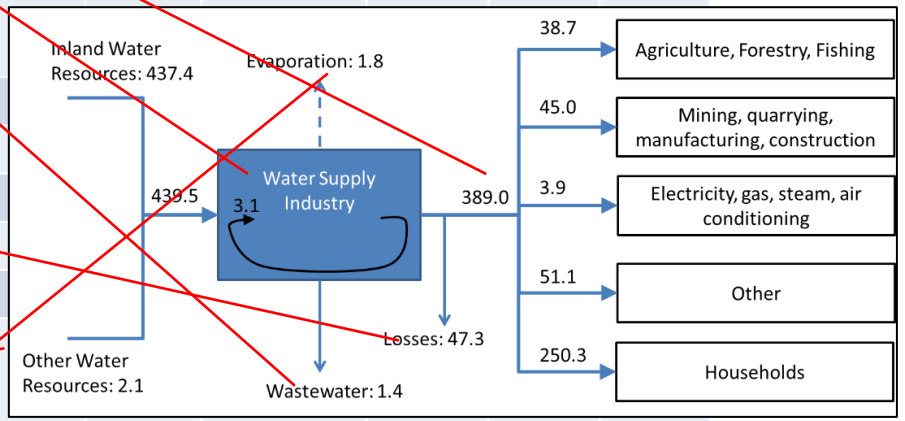
An example-supply

	Abstraction of water; production of water; generation of return flows							RoW		
	01-03	05-33, 41-43	35	36	37	38, 39, 45-99	Households	Imports	Enviro nment	Total supply
(I) Sources of abstracted water										
Inland water resources									966.9	966.9
Other water resources									202.1	202.1
(II) Abstracted water										
For distribution				389.0						389.0
For own-use	108.4	114.6	404.2	3.1	100.1	2.3				732.7
(III) Wastewater and reused water										
Wastewater	17.9	117.6	5.6	1.4						
Reused water produced		10								
(IV) Return flows of water										
To inland water resources	65	23.5	300	47.3						
To other sources		5.9	100							
(V) Evaporation of abstracted water, transpiration and water incorporated into products	76.2	43.2	2.5	1.8						
Total supply	267.5	314.8	812.3	442.6	627.3	55.7	250.3		1169.0	3939.5



An example-use

	Abstraction; intermediate consumption; return flows						F. cons.		RoW		
	01-03	05-33, 41-43	35	36	37	38, 39, 45-99	House holds	Accu m.	Expo rts	Enviro nment	Total use
(I) Sources of abstracted water											
Inland water resources	108.4	114.5	304.2	437.4	0.1	2.3					966.9
Other water resources			100.0	2.1	100.0						202.1
(II) Abstracted water											
Distributed water	38.7	45.0	3.9			51.1	250.3				389.0
Own-use	108.4	114.6	404.2	3.1	100.1	2.3					732.7
(III) Wastewater and reused water											
Wastewater received from other units					427.1						427.1
Reused water	12.0	40.7									52.7
(IV) Return flows of water											
To inland water resources										668.6	668.6
To other sources										362.4	362.4
(V) Evaporation of abstracted water, transpiration and water incorporated into products								10.2		127.8	138.0
Total use	267.5	314.8	812.3	442.6	627.3	55.7	250.3			1158.8	3939.5

An example-use

	Abstraction; intermediate consumption; return flows						F. cons.		RoW		
	01-03	05-33, 41-43	35	36	37	38, 39, 45-99	House holds	Accu m.	Expo rts	Enviro nment	Total use
(I) Sources of abstracted water											
Inland water resources	108.4	114.5	304.2	437.4	0.1	2.3					966.9
Other water resources			100.0	2.1	100.0						202.1
(II) Abstracted water											
Distributed water	38.7	45.0	3.9			51.1	250.3				389.0
Own-use	108.4	114.6	404.2	3.1	100.1	2.3					732.7
(III) Wastewater and reused water											
Wastewater received from other units											
Reused water	12.0	40.7									
(IV) Return flows of water											
To inland water resources											
To other sources											
(V) Evaporation of abstracted water, transpiration and water incorporated into products											
Total use	267.5	314.8	812.3	442.6	627.3	55.7	250.3			1158.8	3939.5