

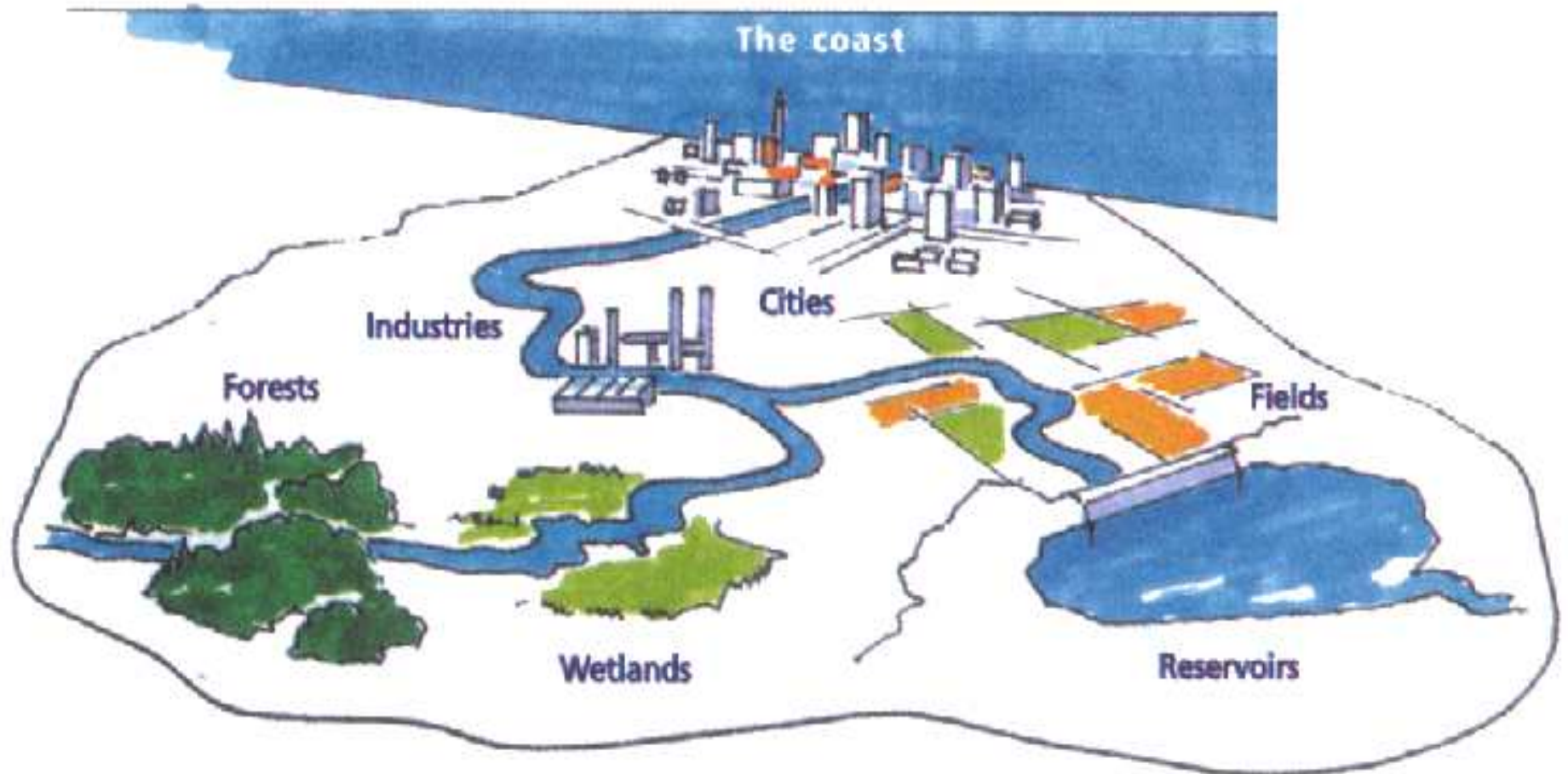
Common Indicators under Article 6, 2 (m)
**Effectiveness of the management, protection
and use of freshwater resources**

Dr Rainer E. Enderlein

Invited expert



Some reflections on experience in Moldova (SDC-UNECE project on target setting) and in other EECCA countries (First Assessment of Transboundary Waters, 2007):



River basins in Moldova

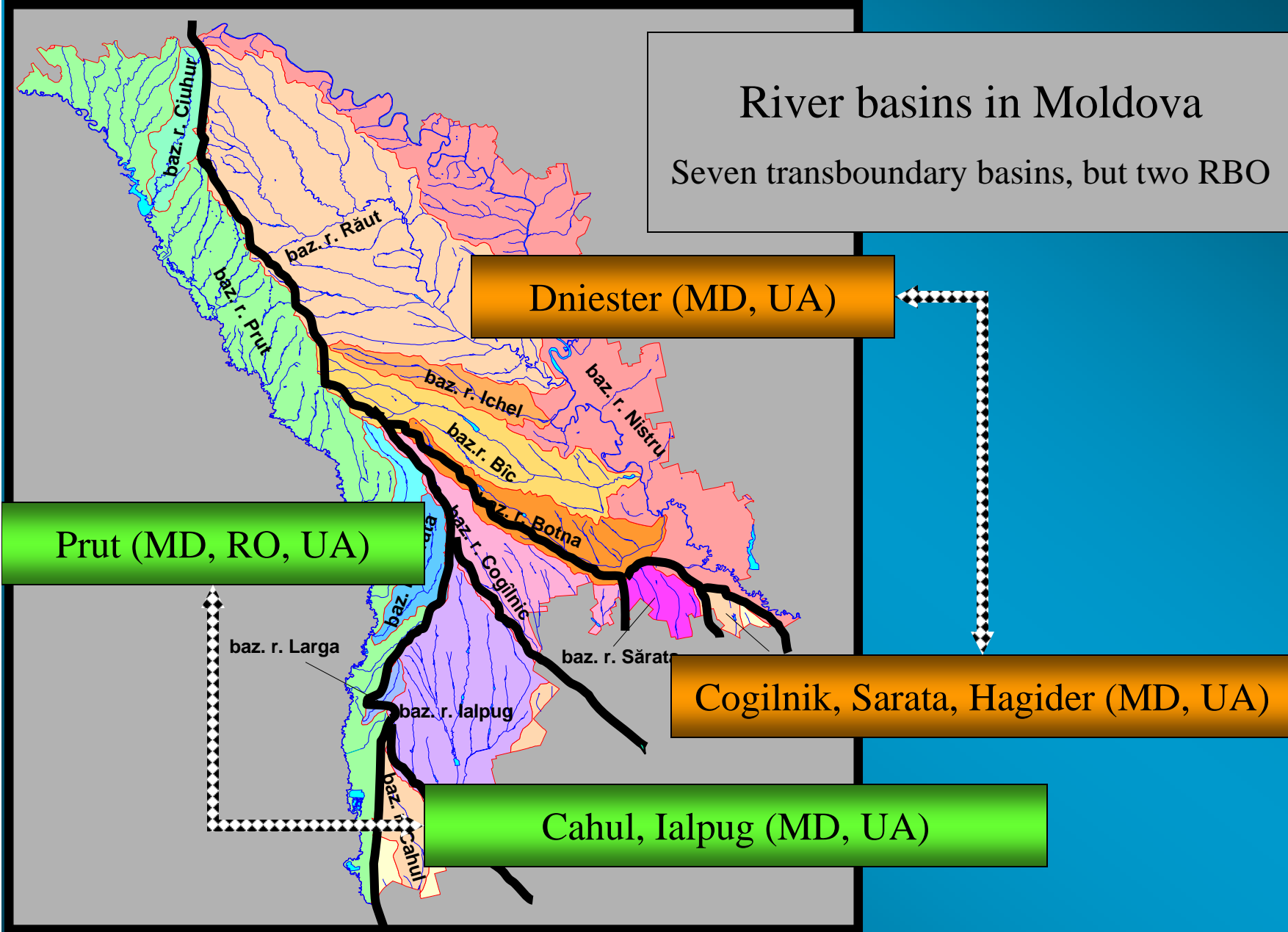
Seven transboundary basins, but two RBO

Dniester (MD, UA)

Prut (MD, RO, UA)

Cogilnik, Sarata, Hagider (MD, UA)

Cahul, Ialpug (MD, UA)



SUMMARY REPORTS FOR EECCA COUNTRIES – WATER QUALITY

On the basis of national systems of water classifications, the *percentage of the number of water bodies* or the percentage of the volume (preferably) of water falling into each defined class.

Water body (WFD):

A discrete and significant element of surface waters, such as a river, a lake or a reservoir

or

A distinct volume of groundwater within an aquifer

SUMMARY REPORTS FOR EECCA COUNTRIES – WATER QUALITY

On the basis of national systems of water classifications, the *percentage of the number of water bodies* or the percentage of the volume (preferably) of water falling into each defined class.

EU countries

- (1) Surface waters: high, good, moderate, poor and bad ecological status
- (2) Surface waters and groundwaters: good or poor chemical status

Non-EU countries

Surface waters, groundwaters: classes I, II, III, etc., of national classification systems

Classification of water bodies: an example

Class	%		
1	10		
2	20		
3	40		
4	20		
5	10		
Classified	100		

Classification of water bodies: an example

Class	%	Number of water bodies in year 1	
1	10	100	
2	20	200	
3	40	400	
4	20	200	
5	10	100	
Classified	100	1000	

Classification of water bodies: an example

Class	%	Number of water bodies in year 1	
1	10	100	
2	20	200	
3	40	400	
4	20	200	
5	10	100	
Classified	100	1000	
Total		2000	

Classification of water bodies: an example

Class	%	Number of water bodies in year 1	Number of water bodies in year 2
1	10	100	200
2	20	200	400
3	40	400	800
4	20	200	400
5	10	100	200
Classified	100	1000	2000
Total		2000	2000

SUMMARY REPORTS FOR EECCA COUNTRIES – WATER QUALITY

On the basis *of national systems of water classifications*, the percentage of the number of water bodies or the percentage of the volume (preferably) of water falling into each defined class.

Clarification needed:

- (1) Percentage as total *for the entire country?*
- (2) Percentage as total *for each river basin?*
- (3) Both at the national and at the river basin levels?

SUMMARY REPORTS FOR EECCA COUNTRIES – WATER QUALITY

On the basis *of national systems of water classifications*, the percentage of the number of water bodies or the percentage of the volume (preferably) of water falling into each defined class.

Clarification needed:

Values in % do not make sense, unless:

SUMMARY REPORTS FOR EECCA COUNTRIES – WATER QUALITY

The total number of water bodies subject to classification
plus
the total number of water bodies in the country
is given

OR, ALTERNATIVELY

The total length of the rivers subject to classification
plus
the total length of rivers in the country
is given

SUMMARY REPORTS FOR EECCA COUNTRIES – WATER QUALITY

Issue for discussion (**2nd** reporting exercise):

As usual, around 15% of water resources in a country are used for domestic purposes

Why should we not look additionally at the « classification » of water bodies that are used as a source of domestic water supply?

ECONOMIC COMMISSION FOR EUROPE
Convention on the Protection and Use of Transboundary Watercourses
and International Lakes



OUR WATERS: JOINING HANDS ACROSS BORDERS

First Assessment of Transboundary Rivers, Lakes and Groundwaters



140
Transboundary
Rivers

30 Transboundary
Lakes

70 Transboundary
Aquifers

>150 experts

40 countries

Classification of the Siret River in Romania

Class/year	2003	2004	2005
1	45 %		
2	22.7 %		
3	23.2 %		
4	4 %		
5	5 %		
Total length classified	2764 km		

Classification of the Siret River in Romania

Class/year	2003	2004	2005
1	45 %	48.2 %	
2	22.7 %	33.3 %	
3	23.2 %	10.7 %	
4	4 %	0.5 %	
5	5 %	7.2 %	
Total length classified	2764 km	2764 km	

Classification of the Siret River in Romania

Class/year	2003	2004	2005
1	45 %	48.2 %	31.8 %
2	22.7 %	33.3 %	40.3 %
3	23.2 %	10.7 %	19.2 %
4	4 %	0.5 %	3.8 %
5	5 %	7.2 %	5 %
Total length classified	2764 km	2764 km	2897 km

Carefully look at the basis for classification, e.g. length of rivers considered in each year.

Tobol river in Kazakhstan upstream of the border with the Russian Federation

Year	Water-quality class
2001	5
2002	5
2003	3
2004	2
2005	6

Tobol river in Kazakhstan upstream of the border with the Russian Federation

Year	Water-quality class
2001	5
2002	5
2003	3
2004	2
2005	6

Water quality improvement from class 5 to class 3

Pollution will continue to adversely affect drinking water supply

Look at critical water-quality determinands, e.g. phenols and copper

Water pollution index at two stations on the Ural river in Kazakhstan

Station	1994	1995	1996	2004
Uralsk	1.55	1.68	3.03	1.42
Atyrau				

Water pollution index at two stations on the Ural river in Kazakhstan

Station	1994	1995	1996	2004
Uralsk	1.55	1.68	3.03	1.42
Atyrau	0.96	1.04	1.01	-

Consider water-quality changes along the river (pollution sources, changes in land use, dilution effects, flooding, ...)

Classification of lakes remains a major challenges




In lakes, eutrophication is the worst phenomenon. It is increasing constantly (except in areas where wastewater treatment has been effectively implemented).

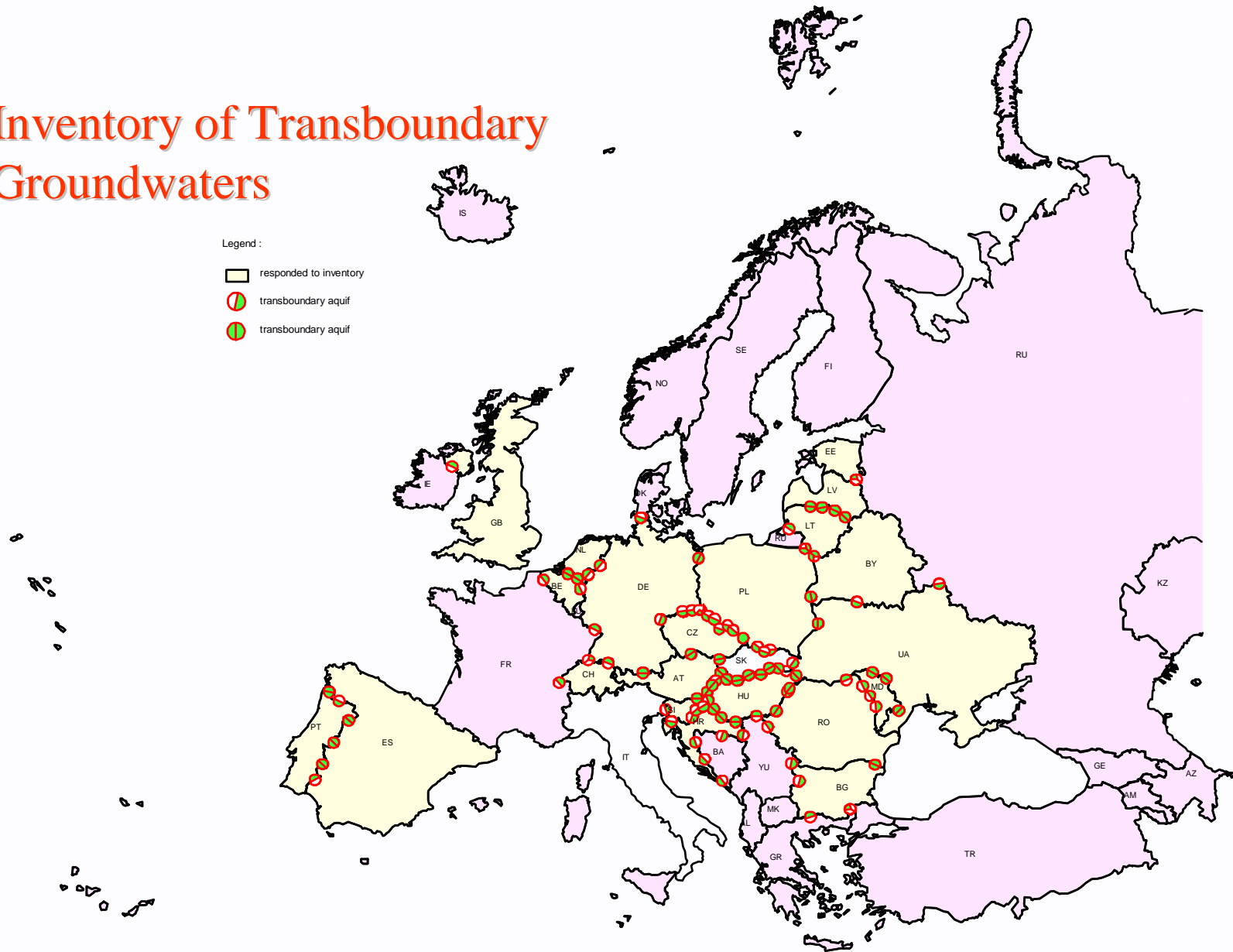
Cyno-bacteria are of major concern.



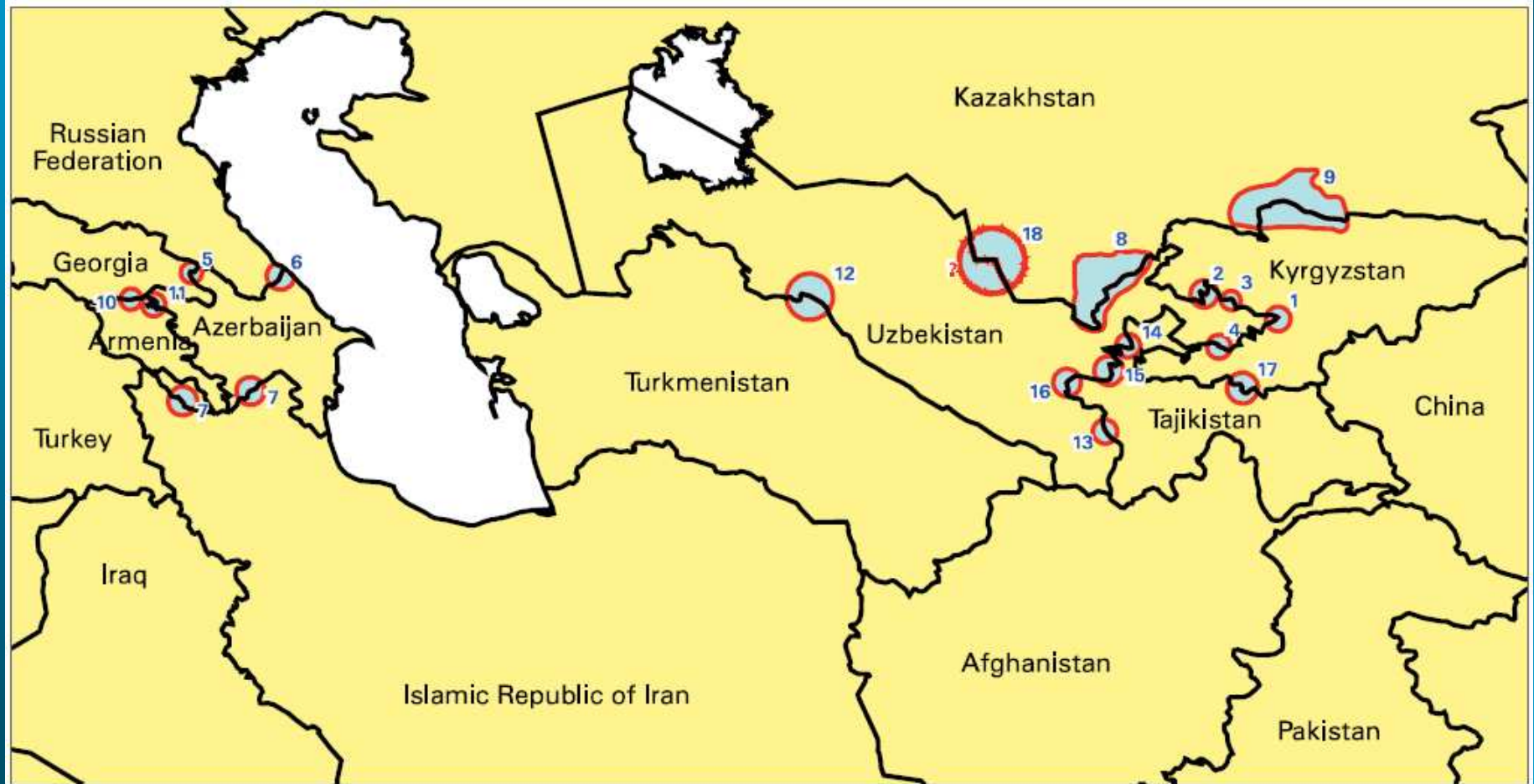
Inventory of Transboundary Groundwaters

Legend :

-  responded to inventory
-  transboundary aquif
-  transboundary aquif



Transboundary groundwaters in the Caucasus and Central Asia



SUMMARY REPORTS FOR EECCA COUNTRIES – WATER QUANTITY

Water exploitation index at the *national and river-basin levels* for each sector (agriculture, industry, domestic): mean annual abstraction of freshwater by sector divided by the mean annual total renewable freshwater resource at the country level, expressed in percentage terms.

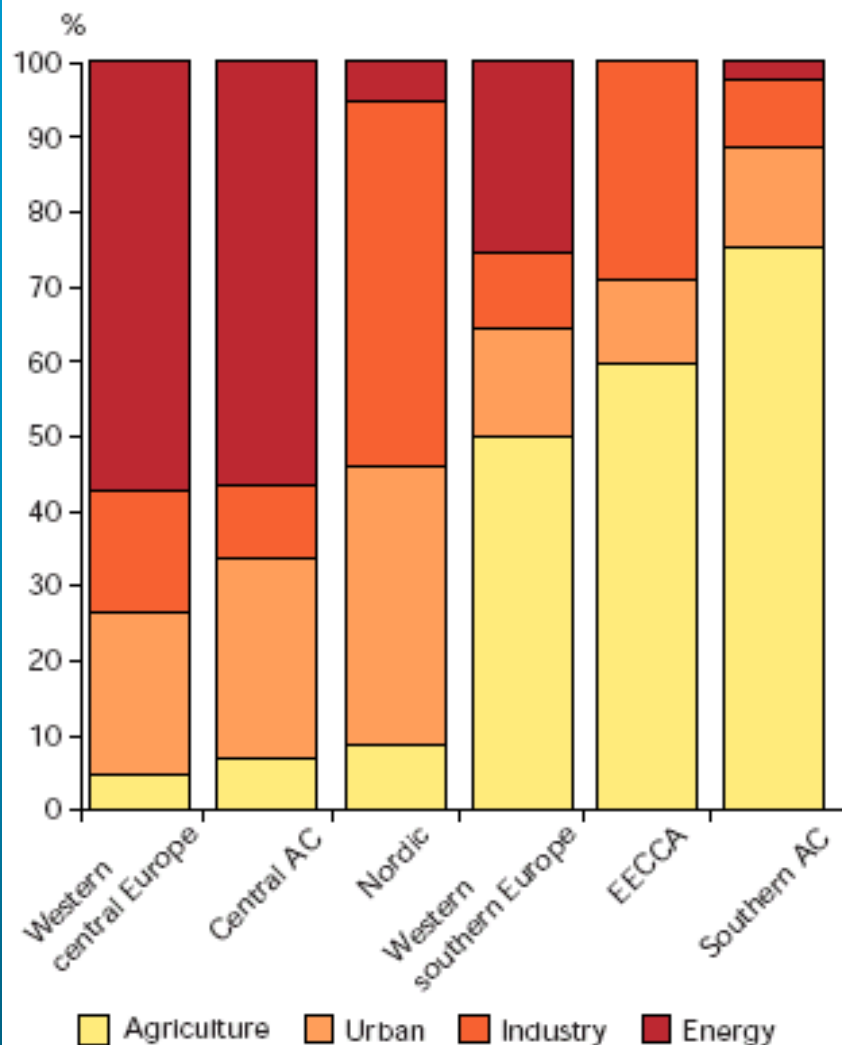
Clarification needed:

What is the definition of “industry”?

Look at UN classification of all industrial activities

Sectoral abstraction of water per region

Figure 8.5.

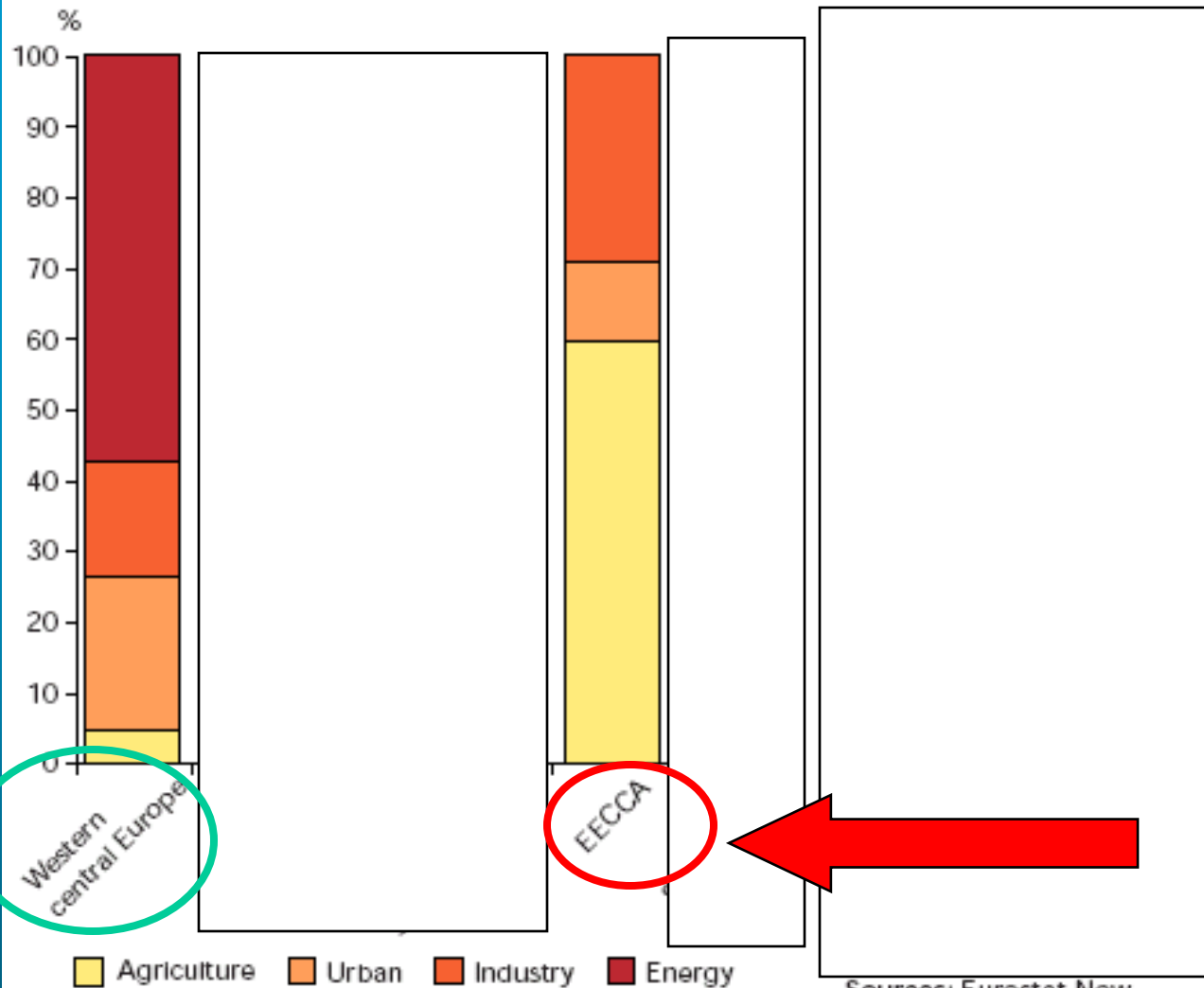


Notes: Western central: Denmark, Germany, Belgium, United Kingdom, Ireland, Austria, Luxembourg, Switzerland, the Netherlands, Liechtenstein; central accession countries: Poland, Czech Republic, Estonia, Lithuania, Latvia, Romania, Slovakia, Hungary, Slovenia, Bulgaria; Nordic: Finland, Sweden, Norway, Iceland; western southern: Spain, France, Greece, Italy, Andorra, Portugal, San Marino, Monaco; EECCA: Kazakhstan, Turkmenistan, Tajikistan, Kyrgyzstan, Ukraine, Russian Federation, Belarus, Uzbekistan, Republic of Moldova, Armenia, Azerbaijan, Georgia; southern accession countries: Cyprus, Malta, Turkey. Industry in EECCA may include water use for cooling.

Sources: Eurostat New Cronos; EEA questionnaire (2002); Aquastat (FAO), 2002 for EECCA countries

Sectoral abstraction of water per region

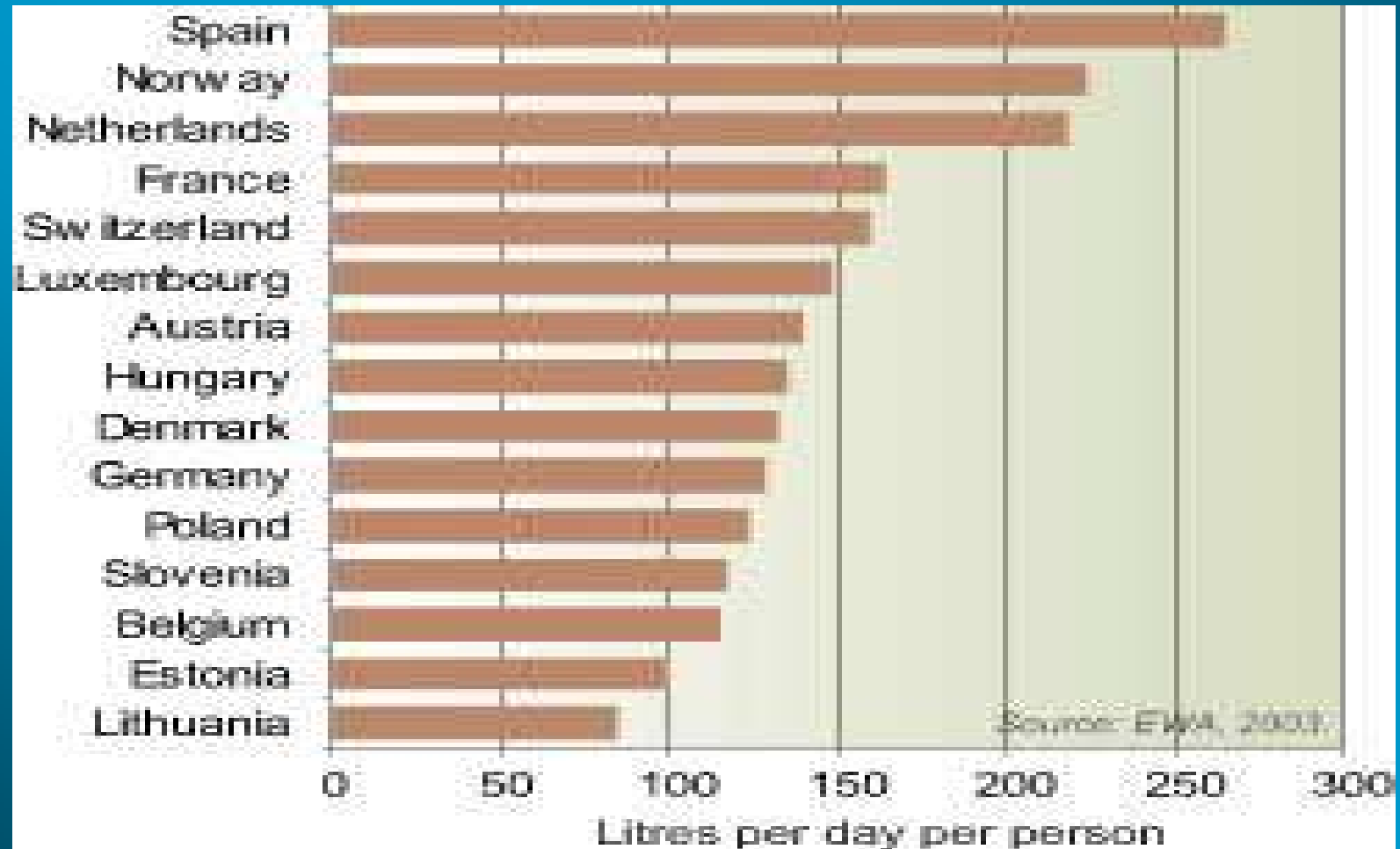
Figure 8.5.



Sources: Eurostat New Cronos; EEA questionnaire (2002); Aquastat (FAO), 2002 for EECCA countries

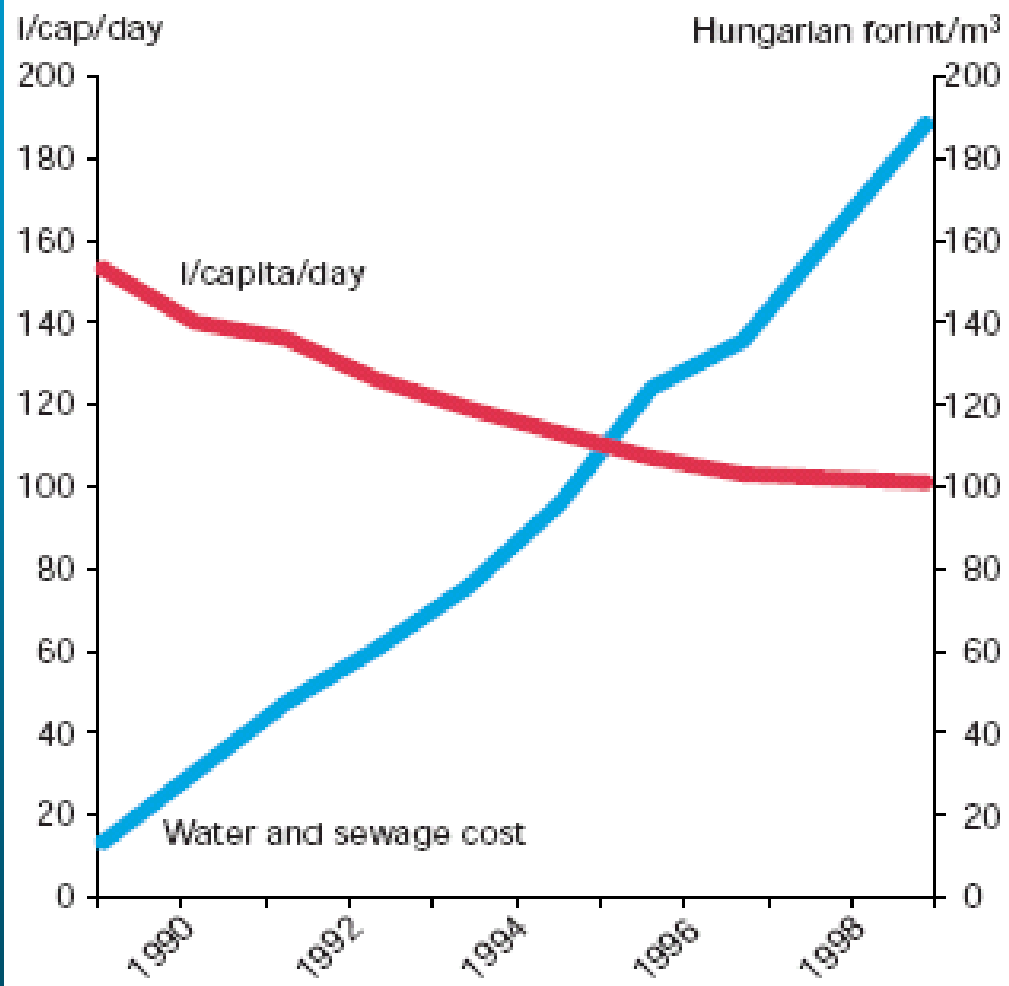
GUIDELINES FOR THE APPLICATION OF
ENVIRONMENTAL INDICATORS IN
EECCA COUNTRIES

Water use in selected UNECE countries



Changes in household water use and price of water in Hungary

Figure 8.7.



Source: Hungarian Central Statistical Office, 2001

New legislation on household water use in EECCA

Armenia (similar in preparation for Georgia and Kyrgyzstan)
for rural areas based on OECD-led national Policy
Dialogue on water supply and sanitation under the EU
water Initiative

- 50 liters/day and person
- 8 hours a day continuous supply
- Maximum 100 meters distance between the “tap” and the apartment

Water use in Moldova

Объем подачи воды на 1-го человека / сут:

В целом по республике, без г.Кишинева, составляет 100 л/чел/сут

- для сельского жителя – 50 л/чел/сут
- По городам не менее 130 л/чел/сут

Наиболее высокие уровни водопотребления в городах Кишинев, Бендеры, Тирасполь, Бельц, Рыбнице.

Наиболее низкие водопотребление - 35-83 л/сут.

***WE
ARE
ALL
PART
OF
THE
PROB-
LEM***

***... but we should be all
part of the solution***









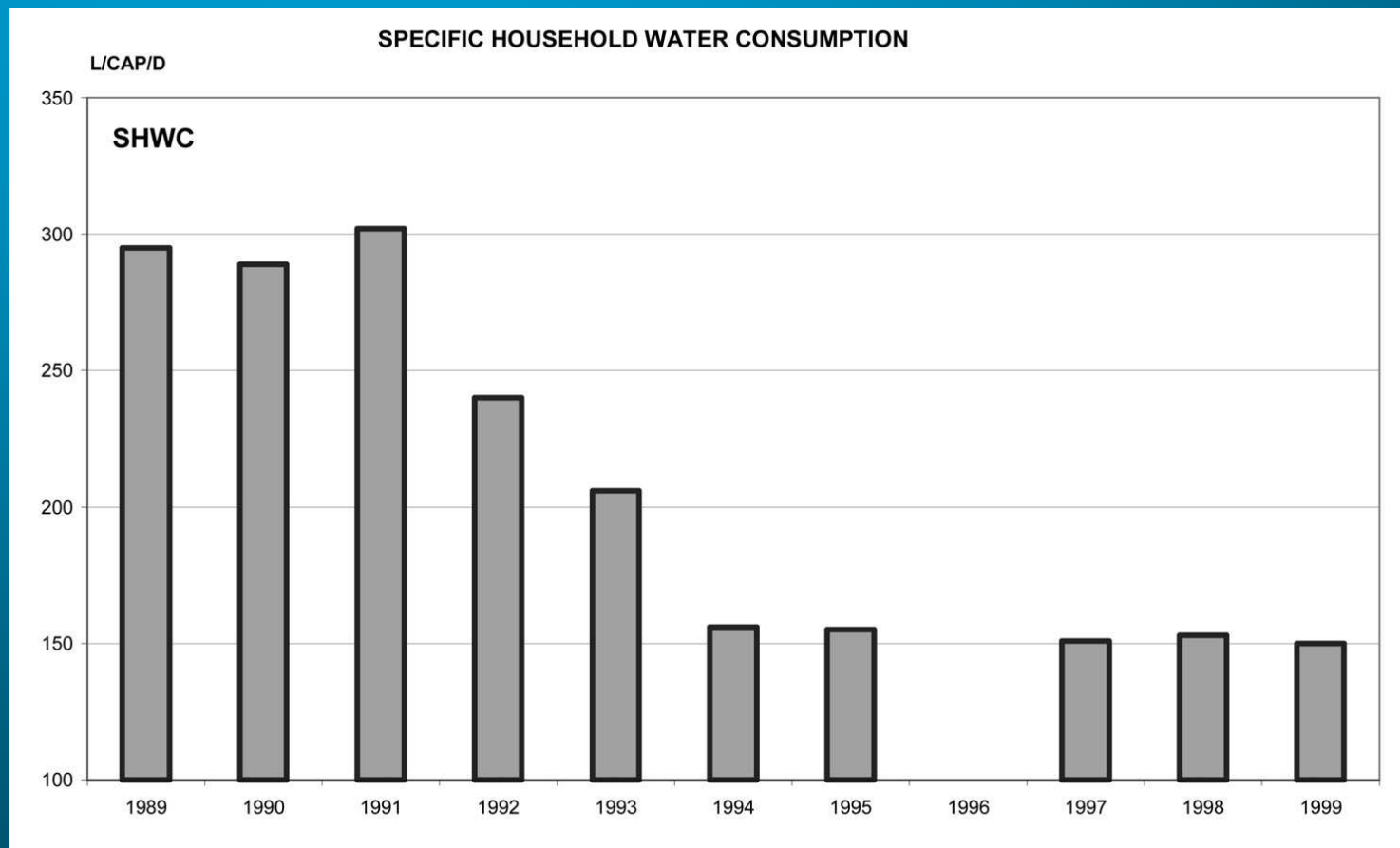




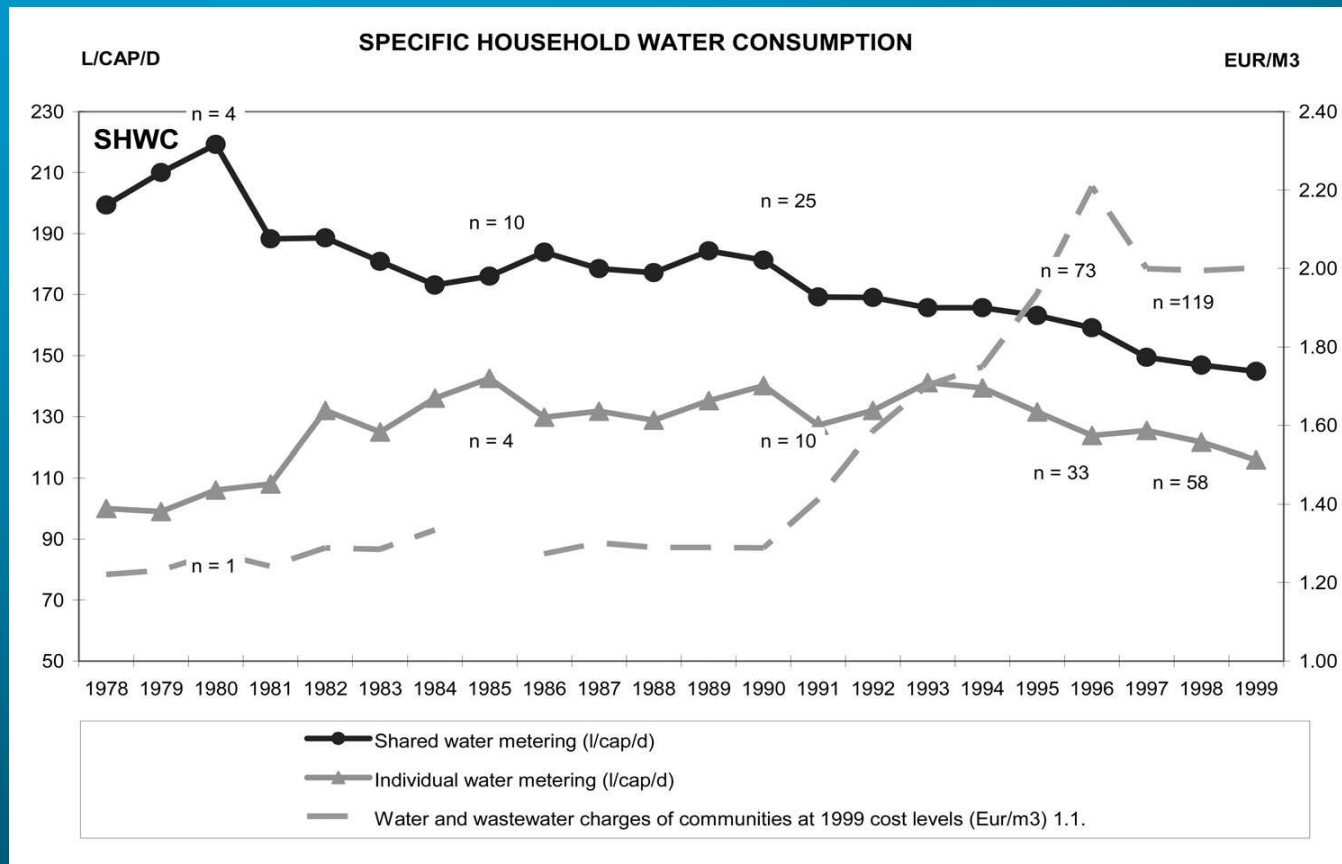
FOR FURTHER USE IN DISCUSSION

Specific household water consumption (SHWC) of row houses constructed between 1920 and 1936.

Every building received its own water meter in 1992.



Household water use in Finland: impact of shared and individual metering



Household water use in Switzerland and Finland: a comparison

Switzerland (2003)			Finland (1998)
Activity	Water use (l/day)	Water use (%)	Water use (%)
Toilet	47.7	29	14
Bath/shower	31.7	19.6	49
Washing machine	30.2	18.6	14
Washing dresses (manually)	20.7	12.8	
Cooking and drinking	24.3	14.9	20
Other (including car washing and watering of plants)	7.4	4.5	3
Total	162	100%	100%

KEY ELEMENTS FOR TARGET SETTING ON IWRM

