



Agence Nationale de la Recherche
ANR


SWAN – International Conference on Data, Information and Knowledge for Water Governance in Networked
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EAU&3E : Data Issues for Sustainable Urban Water Services


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 eau de Paris
service public de l'eau


 ADES
UMR 5185


 brgm
Géosciences pour une terre durable

 G-eau
Gestion de l'Eau, Acteurs, Usages


 SMASH

 ENGEES
ÉCOLE NATIONALE DU GÉNIE DE L'EAU ET DE L'ENVIRONNEMENT DE STRASBOURG

 CIRE

 **EAU&3E**
la durabilité des services d'eau dans les grandes villes


Learning to swim in the troubled waters of impure public goods



Water as an impure public good (from P. Samuelson, 1954 & V. & E. Ostrom, 1977)

Rivalry between Users

		Yes	No
Possibility of Exclusion	Yes	Private or Market Goods <i>Chile / Murray Darling mineral water</i>	Toll or Club Goods <i>Public Services in developed countries</i>
	No	Common Pool Resources <i>Common property</i> <i>Ex. overexploited aquifer</i>	Fully Public Goods <i>Lighthouse / navigable rivers /</i> <i>Water in developing countries ?</i>



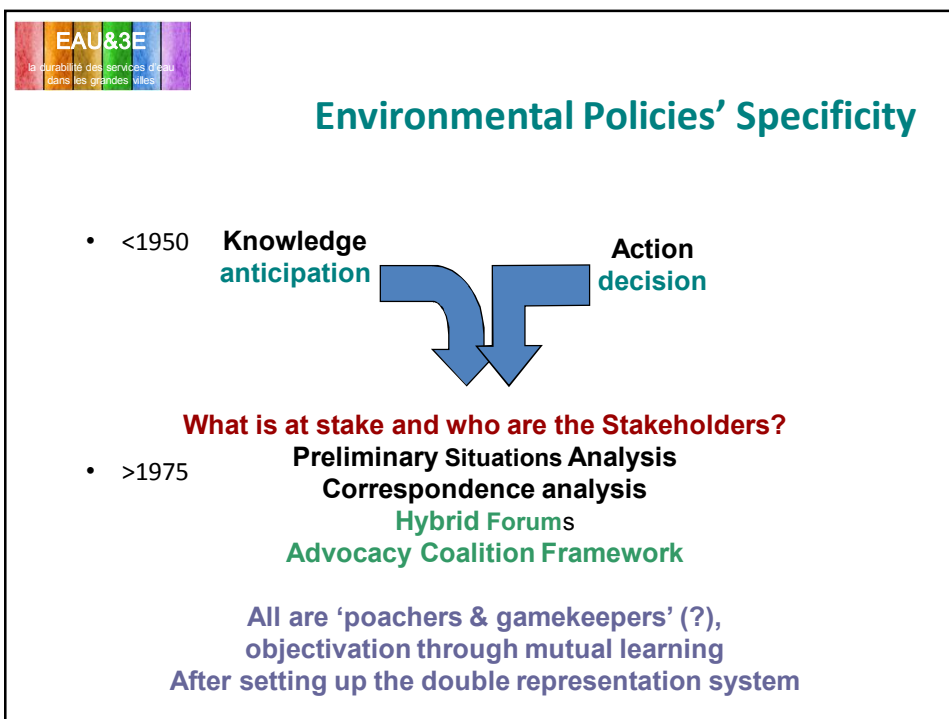
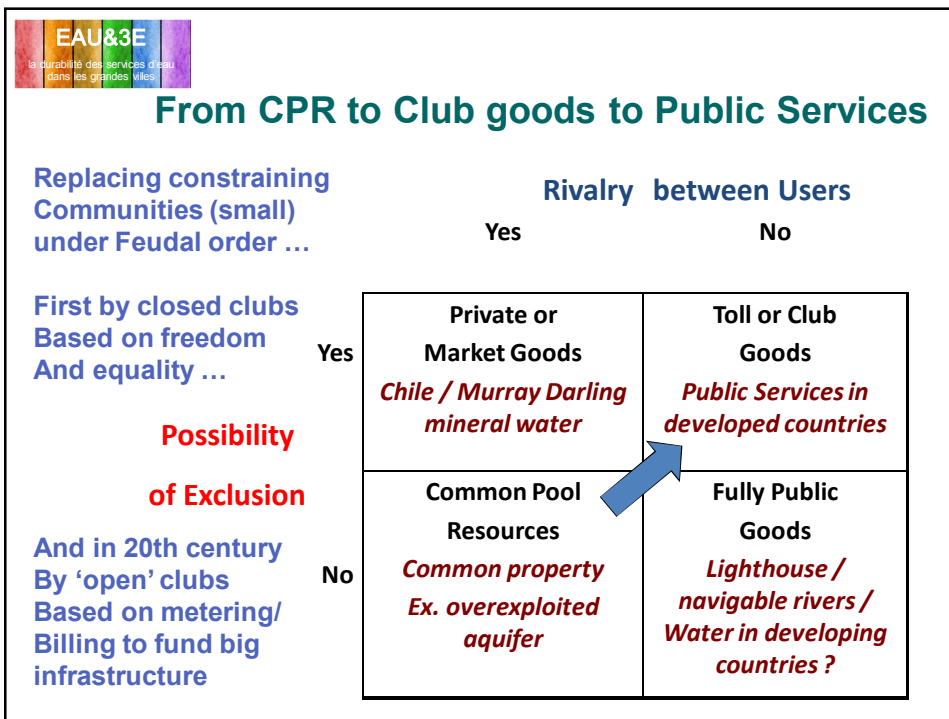
Two different types of impure public goods

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CPR

WSS






Here I do not focus on water resources

- Dave Huitema just covered it
- I just want to mention one issue: are modern and very large River Basin Institutions (RuhrVerband, Dutch Waterboards, French Agences de l'eau) still 'ostromian' communities ?
- And recall that water management today requests a vast amount of data, on water quantity and water quality
- A thesis made on IWRM implementation in Brazil showed that there were good data on quantities of water resources but not on their quality
- And conversely poor data on water services quantities, better on their quality.
- Worst: not felt as a problem by the water policy community!




I focus on the sustainability of public services

- Therefore on the issues and data for cities of developed countries: Huge capital maintained by professionals under control of our elected representatives, paid by customers
- However remember that even in Europe, not everybody is connected to public potable water (e.g. Galicia, Ireland ... not talking about sewage collection & treatment)
- Today there are ecology-minded people and also individualists who wish to 'unplug' from the networked public service
- More generally, the decrease of water volumes sold in down-town European cities creates a new crisis, and illustrates the need for managing the 3 axes of sustainability simultaneously: **the 3 Es**



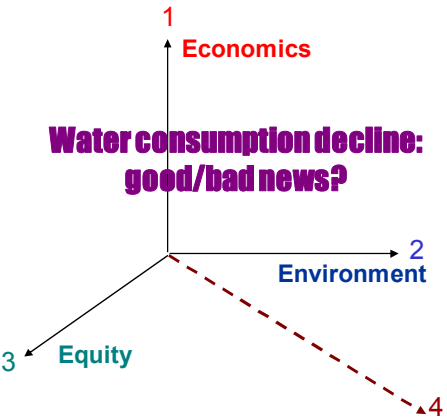
Urban Water Sustainability Issue

A more analytic vision



Are European WSS sustainable?

Europe has some of the best WSS in the world. High connection rates, moderate consumption, pollution control; **Yet looming crisis**



**Water consumption decline:
good/bad news?**

- 1** – Enough investment to renew the decades' old heavy infrastructure?
- 2** – How much more needed to improve environmental performance (EU Directives, national laws, etc.)?
- 3** - If 1 and 2 are met, is water price still socially acceptable? Social tariffs? Why not return to citizens (taxes) on top of sole consumer-pays?
- 4** – And politically? Need of a 4th axis, on **governance** and re-territorialization

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Italy : from 8000 communes to 91 ATO

Regione	n° ATO	n° Comuni	Popolazione
AB 1 - Ancona	36	587.000	
AB 2 - Marche	26	177.000	
ADM 1 - Puglia-Adriatico	37	75.167	
ADM 2 - Foggia	64	439.000	
ADM 3 - Basilicata	21	286.423	
ADM 4 - Calabria	62	270.824	
ADM 5 - Lazio	122	813.200	
ADM 6 - Campania	100	701.613	
ADM 7 - Basilicata	60	334.453	
ADM 8 - Calabria	27	173.247	
ADM 9 - Sicilia	60	178.823	
ADM 10 - Marche	37	379.227	
ADM 11 - Valle d'Aosta	100	720.213	
ADM 12 - Marche Umbria	164	2.027.027	
ADM 13 - Lazio	78	1.455.610	
ADM 14 - Marche	68	185.363	
ADM 15 - Marche	67	262.875	
ADM 16 - Marche Umbria	62	679.865	
ADM 17 - Marche	67	669.722	
ADM 18 - Marche	60	953.876	
ADM 19 - Marche	38	265.877	
ADM 20 - Marche	19	349.897	
ADM 21 - Marche Umbria	30	349.198	
ADM 22 - Marche	30	265.183	
ADM 23 - Marche	62	377.379	
ADM 24 - Marche	106	920.441	
ADM 25 - Marche	65	198.138	
ADM 26 - Marche	67	297.620	
ADM 27 - Marche	6	267.620	
ADM 28 - Marche	67	267.620	
ADM 29 - Marche	111	3.069.097	
ADM 30 - Marche	64	622.206	
ADM 31 - Marche	36	568.282	
ADM 32 - Marche	66	470.803	
ADM 33 - Marche	36	372.190	
ADM 34 - Marche	67	533.127	
ADM 35 - Marche	66	393.101	
ADM 36 - Marche	67	716.000	
ADM 37 - Marche	746	469.722	
ADM 38 - Marche	300	1.173.373	
ADM 39 - Marche	60	311.122	
ADM 40 - Marche	122	346.887	
ADM 41 - Marche	102	622.643	
ADM 42 - Marche	62	385.474	
ADM 43 - Marche	36	393.101	
ADM 44 - Marche	100	620.221	
ADM 45 - Marche	79	179.569	
ADM 46 - Marche	161	816.000	
ADM 47 - Marche Umbria	106	2.211.057	
ADM 48 - Marche	1	1.201.991	

1994: Galli Law




Italy : a too fast and rigid reform ?

- The reform left no role for local authorities, except fight for one !
 - No more direct management, but public enterprises or concessions with a price revision like in England & Wales
 - But with heavy investments to do : WFD + sewage works to be completed + ageing pipes => **treble** the water price? Berlusconi government pushed a more liberal interpretation (Ronchi decree)
 - But the reform was blocked by supporters of public procurement: a referendum gave massive support to public procurement + Zero interest on loans.
- **As a consequence, investment collapse ...**



Wallonia wastewater: concentration to Face UWWD






New Water Tariff closer to Full Cost

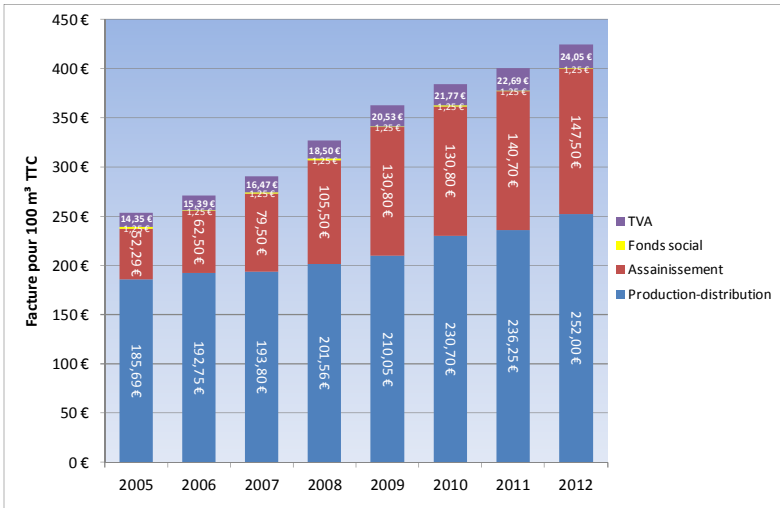
Pricing structure with fixed part and growing blocks

Fixed Charge	20 CVD + 30 CVA
From 0 to 30 m ³	0.5 CVD
From 0 to 5 000 m ³	CVD + CVA
From 5 000 to 25 000 m ³	0.9 CVD + CVA
Beyond 25 000 m ³	aCVD + CVA with $0.5 \leq a \leq 0.9$
+ Water Social Fund	0.0125 €/m ³

It applies to households, industries and farmers as well



Resulting Water Bill : +70 % in 7 years !



Year	Production-distribution	Assainissement	Fonds social	TVA	Total
2005	185,69 €	46,60 €	0,00 €	0,00 €	232,29 €
2006	192,75 €	52,75 €	0,00 €	0,00 €	245,50 €
2007	193,80 €	54,00 €	0,00 €	0,00 €	247,80 €
2008	201,56 €	54,00 €	0,00 €	0,00 €	255,56 €
2009	210,05 €	58,75 €	0,00 €	0,00 €	268,80 €
2010	230,70 €	60,10 €	0,00 €	0,00 €	290,80 €
2011	236,25 €	60,45 €	0,00 €	0,00 €	296,70 €
2012	252,00 €	65,50 €	0,00 €	0,00 €	317,50 €



Alternative water sources use: Exiting ?

Use of alternative source for indoor use	Average (m ³ /y)	consumption (l/capita.day)
Yes	59.1	71.6
No	80.6	105.0

**Estimated total rainwater used for indoor uses : 11 million m³.
 → Loss of 10 million € for wastewater treatment.**



France: contesting 'privatisation' and new data needs

- **A few corruption affairs during a drought period and within the U.N. water decade put water services on the political agenda**
- **In the 1990's a law (Sapin) mandated opening to tender at the end of each delegation contract**
- **This stirred the development of performance indicators after the british example (OFWAT)**
- **They were combined with our '3Es' approach**
- **It reinforced our idea that one must pay attention to the 4 dimensions of sustainability together, if only to check inconsistencies between them.**



Just a few paradoxes

- **Claiming water as a Common good but advocating the generalization of individual metering and billing (which is going towards more market)**
- **Like the economists, they forget the notion of transaction costs, which is precisely the cost of the data for the billing**
- **Ignoring the difference between consumer justice and social justice: increasing block tariffs frequently have regressive effects on large and poor families**
- **Opposing smart meters for their supposed intrusion in privacy, while they are an indispensable asset for our analyses (real time info)**
 - **Nobody checks the redistributive effects in the end, Because when they do, they find that prices have little impact**



Next challenge: who wants these data public?

- **Pascal Arnac (ex-Veolia) wanted to set up a wiki-water budget tool to help citizens put their water utility under scrutiny**
- **I joined him and a municipal-support NGO in a project submitted to Ile de France Region's PICRI tender, but turned down**
- **Pascal also was excluded of the Socialist Party taskforce preparing the presidential election water theme, even though he was a member, and the leaders of the taskforce were not.**
- **Arnac is close to *arnaque*, i.e. swindle (*estafa* in spanish), and they made that bad joke public ...**
 - **When they guillotined Lavoisier, they said:
*La République n'a pas besoin de savants***




Analytical Framework

- **Specificity of water assets** hard to grasp by usual economic toolbox: e.g., antinomy between water conservation and cost recovery under volumetric tariffs => tools to improve knowledge of infrastructure and operator's management performance
- Need to develop **New tools** to analyse **water consumption factors** : « macro » surveys are insufficient (cf. work by Jay Lund & coll.)
- **Redistributive effects** of tariff formulas end up being **counter-intuitive** : need for socio-economic «before-after» field surveys
- Future WSS services resilience tends to imply **multi-level governance** relying on a double evolution : « up-scaling » & « down-scaling »
- Governance plus WFD : new mix of **technologies/territories**



Methodology

- **2 first years** : a **survey** on other developed countries' practices (Europe, USA, Australia)
- Contribute to improve knowledge in each of **4 dimensions** considered:
 - What makes water consumption change?
 - Designing systematic & long term infrastructure management/renewal?
 - What sustainable management of the social dimension / right to water?
 - Which new governance formulas could be imagined?
- **Case studies**
 - Paris : important consumption decline (-30% since 1991)
 - Bordeaux : deep aquifer overexploitation => re-allocation of water resources
 - Languedoc-Roussillon : thirsty urban sprawl + drilling fever (?)
- **General difficulty** to obtain the appropriate data



Demand forecasts


Micro-analysis of water consumption factors beyond traditional price / income elasticity studies

Paris & Languedoc-Roussillon + Los Angeles

- Trying to make use of smart metering to work at census tract level
- Econometric analysis including climate and housing types
- Impact of individual solutions (well drilling, water harvesting)


Example : typical consumption by lot size
 Confronted with real purchase to find wells

Cadastre



+


Ortho-photo




+

Traitement image
+ Croisement
SIG

=





Social tariff design

We develop a tool to evaluate the distributive effects of any tariff system, based on 'water poverty index' :

Multi-purpose solidarity model (TSMO)

Data on households income and size, and on the utility's budget

→

Tariff design under Constraints (the 3 E's)

→

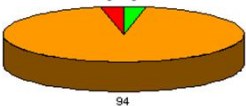
Who pays what for water services, and what provisions left to the utility

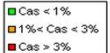
Optimising within 3 major targets

1. Minimise water poors
2. Maximise provisions for renewal
3. Minimise impact on water resources

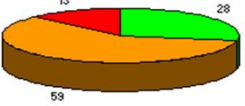
It can lead to counter intuitive effects !

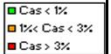
Water poverty before





Water poverty after







Recommendations/conclusion

- **WSS services need to build new knowledge together with consumers/ citizens**
- **It is possible to combine territorial scales where water is a common good, and others where it is a public service**
- **Cost recovery through sole water bills is unsustainable in most cases. Local taxes should be used everytime no obvious service is rendered**
- **In developing countries and low density areas of Europe, can we imagine alternative technology WSS run under the public service ideal (equality-freedom) ?**



A tribute to Evan Vlachos

- **It is better to be approximately right than precisely wrong**



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- **A lot of books on the back of a donkey don't make a wise ass!**



A tribute to Evan Vlachos

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- **Thanks for your attention**
- <http://eau3e.hypotheses.org>

(Follow the link **ATHENS** to view presentations in English)