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Bernard Barraqué

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Full cost recovery of water services and the 3 T's of OECD

Bernard Barraqué

Abstract

Considering OECD's 3 T's (tariffs, taxes and transfers) for funding water services, we show how declining water consumption triggered the 3 E's (triple bottom line) approach in the water services sector, calling in turn for new governance mechanisms for a global sustainability. We distinguish internal and external governance, each calling for new scientific approaches to support good decision making. We then develop a specific analysis of the recovery of environmental and resource costs when water services face water resources considered as common pool. In France, the liberal state tradition makes this difficult to implement, leading to incoherent water tariffs.

Introduction

Almost 20 years ago, the Water Framework Directive, in its article 9, recommended that water users should pay as close as possible to the full cost of the services rendered by water. This raised two issues: what is included in the 'full cost' of water services? And should all costs be covered through the tariff, or also through taxes and eventually some transfers? The aim of this paper is to present the way these issues are tackled in various EU member states, and to discuss the choices in a perspective of institutional economics.

Full cost recovery indeed both comprises more than O&M and investment payback, and is not easy to calculate. As Peter Rogers & al. put it in a paper for the Global Water partnership (Rogers, 1998), on top of O&M and investment depreciation, which add up to the full internal cost, beneficiaries of the service should also contribute to two other costs, namely the users' cost or opportunity cost, and the environmental cost (fig.1). In the case of water services, it can be assumed that the first one relates to a potential rivalry for quantities of water, while the second relates to water quality problems. To illustrate this, one could say that if there is not enough water for its users in a given territory, economists would recommend to allocate it primarily to the user giving it its highest value, but that other users should be compensated (which is difficult to assess); and if a city discharges in a river pollution loads that impair downstream uses, it should either pay damages to them, or alternatively invest in sewage works in such a way as to reduce its discharge to a point considered acceptable by downstream users. Altogether this could add up to a much higher price than the full internal cost, depending on geographic conditions.

But all these costs need not necessarily be charged onto customers of water services. It is well known that in many developing countries, only O&M costs are charged to customers, while investments are covered by government funding or transfers, so as to let water prices at an acceptable level given the social conditions. But, even in Europe, the picture of costs' allocation between tariffs and taxes or transfers is contrasted and complex: it is frequent to introduce taxes in water bills, and to transfer on customers the levies corresponding to environmental and users' costs that are due by utilities' authorities or operators (case of France). After presenting the different charging systems, we shall discuss what should a sustainable tariff encompass, and how governance is needed to arbitrate between the 3 E's of sustainability, distinguishing internal and external governance issues. Before concluding, we shall review the possibility to integrate environmental costs and users costs in the relationship between WSS services and water resources, in case the latter are considered a common pool, and how the incapacity of French elites to make room for this notion in their constitution led to

an incoherent and unsustainable evolution of the WSS tariffs. The Ruhr charging system seems more sustainable, and could still be adapted in France.

Situation of cost recovery in Europe

In most European countries water supply and sanitation (WSS) costs are covered by volumetric tariffs, which frequently also include waste water collection and treatment (France or Germany, since the 1960's only). But historically, water services were initially covered by flat fees, or by rates, i.e. by housing or land taxes without connection with water consumption. Today still almost half of British households and a larger fraction of Irish ones pay by rates (Bresnihan, 2015). This may be the result of the precocity in the development of WSS in England (before meters were in use), or the abundance of freshwater in Ireland. It may also be due to the survival of the notion of 'common wealth'.

In other European countries, meters were available when drinking water services were developed, but they were not precise and costly, so the tradition was to have only one meter per building or per property), and to split the bill between residents on the basis of apartment or family size ... In Paris for instance there are still only 93000 meters for a population of 2.2 million, plus another million coming to work during the day, many in office buildings. One meter per condominium makes sense for most of them, since they house less than 15 families of small size (average 1.7) i.e. with moderate consumption.

Another tradition has developed more recently: sub-metering allows splitting the collective bill in proportion of the volumes consumed by each family and not the surfaces: incentive to conserve water is improved, while it remains cheaper for residents than having to pay each a separate bill including a fixed part¹.

In the Netherlands the situation is relatively complex, since water supply is paid by metered volumes to 10 water companies, all belonging to a mix of municipalities and the local province; but people pay for sewerage through housing taxes, and they pay for sewage treatment and for flood defense infrastructure and drainage through a simple family tax (all households pay for 2.5 persons except single persons who pay for 1) to one of the 21 *waterschappen* (waterboards): these former tiny rural communities managing the polders were progressively consolidated at an infra-regional scale after WW2². In other countries which do not have this type of institutions for quantitative water management, it is tempting to pass drainage and stormwater costs onto the sewer bills, in particular where sewer systems are combined; but it is not legal: costs related to rainfall control should be covered by housing or land taxes, and there should be a transfer from the general budget to the sewer budget.

There is some coherence in the Dutch charging system: drinking water is considered as a commercial service, so it is charged by volume; sewage collection is not, it is imposed for health reasons so it is paid by a tax; and the relationship to water resources, both in quantities (drainage and flood control) and in qualities (sewage treatment) were kept in a long tradition of common pool management and are paid through mutualised service fees charged on families (but also on industry and agriculture). These three forms of cost recovery could be related to three different statuses of water, as we'll see below: club good, public good, common pool.

¹ Usually the fixed part in a French subscription follows the diameter of the meter. But, once divided by the number of apartments, subscription to a larger meter is much less than the sum of the costs of individual meters.

² For an assessment of Dutch water policy, see [OECD, 2015](#)

In Mediterranean countries of Europe, individual metering of apartments in condominiums is more frequent, but there was little tradition to recover the costs of investments in the tariffs, and as a consequence, water services remained under-funded and in particular sewage collection and treatment. Some of them benefited joining the European Union, since they received cohesion and regional funds helping them to upgrade services (PIGS). In other countries like Italy, ineligible to these EU funds, investments were instead subsidized by national or regional governments. The modernization reform proposed by the Galli law of 1994 was expected to seriously impact the prices of WSS, and implementation is meeting important resistance: within the present leading coalition, the *5-stelle* movement presents now a law forcing a remunicipalisation of WSS services, including the abolition of charging for investment coverage in water bills³.

In the end there is a wide array of cost recovery systems using tariffs, taxes and transfers over Europe, but it is not obvious whether they manage to cover the full cost as was defined above. In any case, when costs are not recovered from the beneficiaries of the services, they are, willingly or not, transferred on other stakeholders, or on the same water users but on a different basis; and this is to be discussed. In addition, the allocation of the resource costs or environmental costs between users of the same water resource entails another cost which was put forward by Ronald Coase: the transaction cost, which is the cost of the information needed to optimize the allocation. Striking evidence is offered with the constraints local or regional or national governments face to recover environmental or users costs from citizens: they obviously prefer to use an already existing charging system, i.e. either the water bill or the taxation roll, rather than setting up a special and different one.

The 3 E's of sustainable WSS services

With declining water volumes sold in many European cities, an additional issue was raised, i.e. the affordability of the services: the specificity of WSS assets (fixed costs representing above 75% of the total), obliges their operators to raise the unit price to compensate the decrease in revenues. In turn, higher prices might hit large poor families, all the more so when wastewater collection and treatment is added on the water bill, which roughly doubles it. Added to the needed compromise between economic and environmental dimensions, this social dimension brought the *problematique* in terms of sustainability, which the E.U. funded Eurowater-Water 21 projects co-ordinated by F.N. Correia expressed with the 3 E's formula (Barraqué, 1998; 2003):

- Economics: does the tariff allow to upkeep the infrastructure and replace the ageing parts?
- Environment: how much more should be raised to upgrade environmental performance?
- Equity: Is such a tariff socially sustainable and affordable?

And then finding a balance between these 3 sustainability axes entails some political decision on the governance of the services: in the triple bottom line of sustainability, the three dimensions are not always compatible (Barraqué, 2011). First as we mentioned above, with volumetric tariffs, water conservation is contradictory with the maintenance of assets characterized by heavy fixed costs. Second: full cost pricing could get unaffordable to large poor families, and incentive tariffs like with growing blocks might have unsuspected negative social effects. To limit these impacts, one requests information which is costly, so that sophisticated tariffs incur high administration costs. We have repeatedly found that consumer justice (pay as you use tap water) does not equate social justice (a fair share of revenue to access an essential good).

³ Proposta di legge: DAGA ed altri: "Disposizioni in materia di gestione pubblica e partecipativa del ciclo integrale delle acque" (52). <https://www.camera.it/leg18/126?leg=18&idDocumento=52>

The new situation of WSS services in Europe (and surely in other developed countries, e.g. [Beecher & Chesnutt, 2012](#)) calls for improved knowledge in all three dimensions, like understanding why water consumption declines, what link there is with future environmental and public health performances, are there alternative WSS technologies which could reduce the fixed cost on the long run, and what are the redistributive effects of any tariff system, including the impact on bills in arrears as is the case presently in France⁴.

In turn this improved knowledge should lead to a better governance of WSS services. But possibly there is a causal loop, and new forms of water services management with better multi-level coordination are in fact a prerequisite to building up improved knowledge. In the end, better governance of WSS should result in a rational allocation of the costs to be recovered between tariffs, taxes and transfers.

And here we need to distinguish two forms of governance: internal and external governance. Internal governance concerns the development of new relationships between the authorities in charge of WSS services, technical operators and service customers or users. External governance is about improved relationships between a given WSS management unit, and exterior partners like neighboring utilities, regulating authorities, water resource managers, public works and consulting companies etc.

Internal governance and sustainability issues

The time when the only relationship between the operator and water services beneficiaries was limited to the meter (billing and paying the bill) may be behind us. Real time monitoring allowed by smart metering can support new relationships based on permanent exchange of information, e.g. typically operator informing/questioning the customer when there is a sudden change in consumption pattern (for instance when a leak is detected). However, refining the tariff to adapt to each specific customer may end up both costly and inefficient, e.g. with the case of budget rating ([Beecher, 2012](#)).

New modes of public service procurement could also rely on non conventional technologies in specific areas like low density ones. Is it possible to disconnect the notion of public service from the technology of networked infrastructure? Can authorities and operators help customers to self manage decentralized or semi-central WSS systems, eventually through some technical assistance relying on remote-control monitoring? Can they also control the potential new trend of some customers drilling their own well or harvesting water, and assess their consequences on overall water resources abstraction, on water quality (backwater flows) and on reduced funding of public services (e.g. unpaid wastewater flows) while facing increased demand peaks?

More generally, informing customers implies more transparent tariff setting, and therefore opening with them a debate on the equity of the tariff. But this is a vast new issue, given the complexity of the factors at stake in tariffs. In fact there is absolutely no tradition of operators and authorities checking the redistributive effects of a tariff change in practice, after it is implemented and practiced by households of various sizes and revenue levels. And first, typically in Europe water consumption is all the more inelastic to price and to revenues since it is moderate and even low in some countries. As a result, any progressive (blocks) tariff should be very carefully designed to avoid negative social impacts as principal outcome. The Barcelona 'water war' of the 1990's is illustrative of this ([Domene,](#)

⁴ In France, individual metering at household level was supported as a prerequisite to tariffs incentivising water conservation; but implementing the right to water led to ban any disconnection for non-payment. As a result, the amount of bills in arrears is steadily growing since.

2012). Designing a social tariff system is both a complex and debated issue (Barraqué & Montginoul, 2015): will rebates for low income families be covered through an increase in other customers' bills (for instance through waving part of the fixed part, or cheaper first block), or through general budget support, 'outside the bill'?

Indeed, a serious problem when water is metered is to find a balance between the fixed and the variable parts. On the one hand, since most of the WSS costs are fixed costs, the fixed part should represent most if not all of the bill (not mentioning flat rates or rates related to housing values)⁵; but economists would then argue against the corresponding absence of incentive to conserve water. In France, a balance was found in the law, with a ceiling of the fixed part at 30% of a yearly water bill for 120 m³ water consumption. Touristic areas with variable populations are allowed to raise the fixed part percentage to 40%.

The average yearly consumption at 120 m³ is itself questionable, since it roughly corresponds to a family of 4, while the average household size in Europe is now around 2, and in some cities or countries (Paris, Germany, Netherlands) even lower. For these small households, the fixed part may represent more than half of the bill, and even more if they spend some time away from home (typically wealthy retired persons). With declining water consumption, it becomes more evident that tariff systems set in the past silently and unwillingly transferred part of the cost of water supply to large families with children on smaller households.

This is even more obvious in case there is collective metering and billing at condominium level. The collective water bill is then usually allocated between resident households on the basis of apartment surfaces; the implicit assumption is that large families need more space and use more water. But frequently, ageing persons whose children are gone stay in their apartments, and pay more than in proportion of their water consumption compared to younger people with children ... It may be no surprise then if supporters of individual metering and billing are educated people whose children are gone, but who forget that they benefited cross subsidies when they had children ... In addition, retrofitting condominiums to separate the billing per apartment is often very costly, so that the operator will replace the collective fixed part by individual ones. Traditionally, the fixed part was depending on the diameter of the meter, but once divided by the number of apartments, it was very small compared with the fixed part of a separate meter for each flat. Thus refining the information system to make the tariff system fairer in terms of consumer justice, may end up being very costly for all residents, in particular large poor families, with yet limited potential effects on water conservation. Typically, in the case of Paris, experts convinced the council not to encourage individual metering and billing, but rather to develop smart metering at building level to be able to inform in real time building managers of unusual water consumptions.

This leads to a more general observation about tariff governance: utilities who think that a good tariff will encompass all the dimensions of sustainability, and they won't have to care anymore, are wrong. Setting tariffs is a political decision with social impacts and does not suppress the need to establish more permanent relationships with customers within the new modes of WSS services provision.

We can conclude this section on internal governance with two remarks. First, there is a need for more refined analyses of water consumptions and elasticities: frequently these studies are done by economists at the scale of utilities, which is probably a too 'macro' scale and misses part of the determinants of real consumption: for instance they cannot take the age/reliability of meters or the

⁵ In the Avoriaz ski resort for instance, each apartment has to pay a 100 € yearly fixed part, and since people usually come for less than a month altogether in winter, they end up paying more than 9 €/m³. But otherwise who would cover the cost of the infrastructure?

weather conditions into consideration; which might explain why econometric results are not very significant and elasticities are low (in Europe). This problem might be alleviated by more 'micro' studies, e.g. at the scale of blocks or census tracts, allowing to include more consumption factors including human ones.

Second, it is possible to develop some software to assess the redistributivity of tariffs, taking advantage of seminal work in this area by [Fitch & Price \(2002\)](#): who pays more than 3% of their revenues on WSS services? The idea ([fig.2](#)) is to allocate the population of a service in a matrix with income deciles or quintiles, and with family sizes (one could add a third dimension – thrifty vs hedonist). Applying any tariff on the resulting matrix will provide an answer in terms of who pays more than 3%, less than 1%, and in between; even more interesting is to see what happens when the tariff is changed: does the new tariff really meet the targets which were imagined first?

External governance issues in cost recovery

What we term external governance has to do with how any utility or WSS service relates with stakeholders who regulate or share water resources, and knowledge and know how: neighboring utilities of course, but also regulators of service provision, consulting and public works partners, upper tier institutions which may bring subsidies and/or impose water resources allocation rules, etc.

While the public vs private debate has been on the forefront since privatization was supported by IFIs as an alternative to poor service provision by governments in the 1990's, our many years' experience teaches that this debate in fact is not raised separately from two other debates: centralization vs decentralization (and more broadly upscaling/downscaling); and integration vs separation with other services (e.g. water + wastewater, or water + electricity, etc.). In England for instance, WSS services were first regionalized at river basin level for a better articulation with water resources management. But criticisms on Regional Water Authorities being both 'poachers and gamekeepers' led the Thatcher government to privatize the WSS services infrastructure, while developing a National Rivers Authority on the other, the latter being later merged with other regulatory offices into the Environmental agency. In that case privatization went along increased centralization. Conversely in 19th century Germany, importing British know how in piped water supply did not lead to privatization, and WSS services were developed directly by municipalities ([Barraqué & Kraemer, 2014](#)); later water supply was merged with other services to form the Stadtwerke which often became private companies owned by local authorities. Some mergers took place but no centralization as occurred in England and Wales.

More recently, due to decreased consumption and revenues, or conversely to risks of scarcity and resource overdraft, there has been a general trend in developed countries to upscale part or all of WSS. Upscaling is advocated for the sake of economies of scale, and tariff harmonization. In some countries like Italy there was a clear will to suppress water supply at small commune level (*l'acqua del sindaco*) and replace it by 'optimal size territories' (ATO), which were frequently considered to be the province level ([Massarutto, 2015](#)). But this reform, which sought to modernize WSS through adopting the British tariff model developed by OFWAT to regulate private utilities, was hotly contested because it was associated with a potential move towards privatization and commodification. A referendum voted 90% against involvement of private capital in WSS and even the banning of interests payment on invested capital. In Portugal the reform was more flexible, with the creation of a public national water company offering neighboring local authorities having problems to create mixed public companies to produce all drinking water and treat all waste water in the consolidated area, while each commune would remain in charge of their WSS pipe systems ([Correia, 2013](#)).

In the Netherlands, municipal water supply was progressively consolidated at regional level with the development of private law companies owned by a mix of communes and provinces. They are now only 10 (OECD, 2014). In France, where WSS services were extremely scattered, an ongoing reform initiated in 2014 aims at dividing the number of utilities by ten (Barbier, 2018) ... This consolidation might change the picture for the delegation of water services to private companies, due to better control and regulation capacity of the new intermunicipal institutions. But, even before this reform, public-private partnerships in France were put under scrutiny after a few corruption affairs were disclosed (Grenoble). A couple of laws then compelled private operators to submit yearly reports based on a number of performance indicators to the local authorities, and the latter to produce a yearly performance report for their citizens. In the end, in France like in many other countries, WSS services are more and better regulated than they were in the past (Canneva, 2018): there are technical regulations (environmental and health, quality of water and of the service), institutional regulations (rules on the public service definition, on the management models), economic regulations (budgetary, tariff-setting, benchmarking), and social-ethical regulations (democratic / citizen information and control). This should bear fruits on the sustainability of water tariffs and their acceptability.

But in any case, this frequent move to upscaling WSS services is not the only recent outcome: there are also downscaling moves, as was in fact illustrated in the above section on internal governance; another possibility for utilities is to develop innovative technological solutions to adapt a changing context. This is for instance the case in Australia, where regional bulk water transfers companies were created, separated from local distribution companies; at the same time in some cities, new housing developments were encouraged to systematize waste water recycling to alleviate water resource shortages; and in some coastal cities, desalination plants were set up.

This is also what happened in Barcelona, which feared that the central government would not authorize a water transfer from the Ebro or from the Rhone in France, to meet a potential deficit due to population growth. The city then built an important desalination plant to be operated in scarcity periods. Soon after the water company AGBAR set up a plant with the same membrane technology to treat waste water from the sewage works, and recharge the alluvial aquifer of the Llobregat upstream from the drinking water plant. This technology sophistication allows solving scarcity issues without having to bargain for more water resources away from the city, and without having to modify the relationship with water customers; i.e. with minimal upscaling and downscaling. But in general, upscaling, downscaling and technology-based solutions can be combined.

An important part of external governance in terms of cost recovery has to do with the relationship between WSS services and water resources, namely for environmental and users costs. The problem is how to charge for these additional costs? And a related question is whether the cost recovery should take the legal nature of the resource into account.

Integration of water resource issues in the costs to be recovered

As we wrote above, full cost includes environmental and resource costs. But should these costs be paid by customers of the services in their bills, by citizens via taxes, or else by users of a common pool resource? In the first case, payment might correspond to looking for a market-based solution to environmental problems. In the second case, taxation and government implication could support the idea of water as a public good. And in the third case the common pool definition of water resources would call some form of community based water management. In this section, we would like to illustrate the discussion with the examples of the levies of French *Agences de l'eau*, compared with the German Ruhr waterboards model that they tried to follow 50 years later (Barraqué & al., 2018).

The idea was to create two levies to charge water users: one on water abstraction to fund water resources mobilization and avoid scarcity (e.g. additional winter storage); the other on pollution discharge to fund the construction of sewage works and improve river quality for the benefit of downstream users (fig.3). These two levies are a way to represent users' costs in case of scarcity, and environmental costs in the case of pollution discharge impacting society (fig.4).

But the issue is how to implement the recovery and use of these levies. In the initial model of the Ruhrgebiet, to solve the dramatic pollution problems due to rapid industrialization and urbanization at the end of the 19th century, cities and large industrial corporations of the Ruhr area got together and obtained the right to transform free-willing local water boards into institutions called *Genossenschaften* (co-operative unions). They were entitled to force stakeholders to pay levies so as to fund the needed infrastructure in a mutual fashion. Interestingly enough, a subsidiary and community spirit prevailed upon political opposition between conservative steel and coal barons on the one hand, and social-democratic cities on the other.

Four river-basin based institutions were set up, each with a specific function: back in 1899, the Emschergenossenschaft transformed the polluted river Emscher into a lined and open sewer down to its merger with the Rhine, where it was treated (primary treatment). In 1913, two institutions were set up on the river Ruhr, south of the Emscher: one upstream to create reservoirs so as to store clean water (Ruhrtalsperrenverein), and the other downstream to build and operate sewage works on behalf of concerned cities and industry (Ruhrverband). After WW1, the Lippe river, north of the Ruhrgebiet, got its own board (Lippeverband) to drain adjacent land and regulate water use by industry and agriculture. This river basin institutions' creation was the first in contemporary Europe. Their budgets were made up with taxes decided and allocated equitably between members, namely industry representatives of various branches, cities, rural districts⁶. *Genossenschaften* were in charge of building the dams and the sewage works, and they never handed the money back to members, who were not entrusted to build their own separate/ competing infrastructure. Once they paid their levies to the basin institutions, cities and other public partners would obviously pass on the costs onto their citizens, usually through increasing the water bills; but more recently some *Genossenschaften* developed new roles on improving the aquatic environment and biodiversity, or flood control, and in that case additional levies paid by local authorities could not be passed on water bills anymore, and were instead charged on citizens via local (housing and land) taxes.

When in 1964 Ivan Cheret imported this model to create the French *agences de l'eau*, he and his partners thought it would be no problem to do the same. Yet several reasons made it impossible: first, instead of a bottom-up process resulting in having watershed partnerships only where they were felt needed, the government wanted to cover the whole country in a more top-down manner, and this was resented by county and local governments. Second, under French constitution, public money must be collected and spent under the control of elected representatives, so that having representatives of industry in the *comités de bassin* led to ban the possibility for the *Agences* to directly build and operate infrastructure. They could only subsidize projects carried by stakeholders willing to invest. Fourth, in the beginning stakeholders were reluctant to pay the levies, and in particular local authorities refused to be taxed by institutions they considered as inferior in terms of legitimacy. So the levies were created as service fees, which allowed avoiding to subject the *agences'* budgets to the vote of parliament every year (*agences* operate within the 5-yr national planning

⁶ In the *Genossenschaften*, individual citizens were not directly represented, conversely to the case of the Dutch waterboards ; this is due to the much more ancient origin of the latter, when they gathered small groups of farmers to collectively control the floods and drain the land. But as we saw above, the result in terms of funding is similar : levies are based on the nature of water as a common pool.

system, which made sense given the importance and duration of funded public works). And soon the levies were transferred directly on water bills, under the argument that it was the citizens and not their local authorities which polluted (ignoring the distinction between initial and final discharge).

But the problem in France is that a public institution can levy a service fee only on those who benefit directly from the investment that is funded. On other stakeholders in the concerned area, according to a decision made in 1959 at the beginning of the Vth Republic, it has to be a tax⁷. It is very interesting to recall the economic rationale of this split in two sorts of parafiscal levies. The then prime Minister, Michel Debré, wanted to clarify the typology of taxes which were multiplying in this Keynesian period. He decided that if the levy corresponded to an State intervention in the economy, it should be a service fee, handled by an institution (industrial and commercial) under private law, and with litigation arbitrated by civil courts; in all other cases where the levy did not correspond to a service, it should be an '*imposition de toute nature*', be handled by an institution under public (administrative) law, with parliamentary budget reviewing, and with litigation arbitrated by the administrative court system. Note that this is a typical translation of liberalism in the Civil code legal system: either commercial-market, or administrative-State.

To make things even more complex, when asked in 1967 if the levies of the *agences* were service fees or taxes, the State Council (equivalent to a supreme administrative court) answered that all water users had to pay so it was a tax, except for those who invested and were aided, for whom it was a service fee; he then proposed to set the abstraction and pollution levies into a third category *sui generis* without defining it further. They obviously did not know Elinor Ostrom who had just finished her PhD, but now we could give these levies of a third type a name: mutualised service fees for the collective management of common pool resources. We could indeed argue that in a watershed, those who only pay their levies still benefit indirectly from the improvement of the aquatic environment made by other stakeholders, even though it is not as clear as in the case of the Ruhr, where it is the mutual institution itself and not any other stakeholder which makes the investments.

Never was this possibility adopted in France. Instead in 1982, the Constitutional court considered that the *agences'* levies were taxes and should be subjected to Parliament review. The water policy community resisted as long as possible, but it never managed to obtain the creation of new levies which would support the implication of the *agences* in under-funded policies like flood control. Instead, starting 1996, the Treasury was allowed to take a small part of the abstraction and pollution levies to fund various policies (flood maps, water police, fishing police ...). And in the end, the 2006 framework law, while redefining the levies into 8 different topics, subjected the *agences'* budgets to yearly parliament review. Law makers promised they would not touch the budgets, but this promise was not kept by the next government (president Hollande) and since then, the Treasury takes 10%, or else reduces the budget by 10%, and at the same time the *agences* have to fund the Biodiversity agency, the office in charge of hunting control, and the national parks' employees. They have a wider scope of intervention, while their staff is now capped.

The French high ranking officers and political class progressively brought the financing system to a complete incoherence: in the name of their State vs Market world vision, they accepted that the levies would be taxes and not service fees, without realising that for the same reason these levies should not be collected on water bills, which correspond to a service! The fundamental reason for this incoherence is in our opinion the incapacity of many in this Civil Code country to really understand what common pool is about and what specific funding system it requests.

⁷ Ordonnance n°59-2 du 2 janvier 1959 portant loi organique relative aux lois de finances.

Towards a sustainable cost recovery

There of course is a solution out of the present incoherence, drawing from our comparative European experience: first there is no problem to cover the cost of water supply and waste water collection in volumetric bills, provided the tariff system is kept simple and equitable (but, as we saw above, it is not so simple). But facing with waste water treatment and water resources availability, then it is the local authorities in charge of WSS services and flood control which should pay the levies to the *agences* (or other watershed institutions when needed), and not the domestic users. In turn, the local authorities should recover what they paid from domestic users either through an addition to water bills or through local taxes: water bills if the support of the *agences* is needed to improve the WSS services, local taxes if it is for protecting the aquatic environment, water-related biodiversity, flood control, etc. In France there is a new possibility to do this: a new move to consolidate local authorities in general gave the opportunity to the Government to decentralize at that level, new responsibilities on the aquatic environment management and flood control (called GEMAPI). And local authorities are allowed to levy on residents a GEMAPI tax (up to 40€/cap/yr) to fund their actions. This could help rebalance the allocation of full cost recovery from the water bills to housing and land tax. And it is all the more important that local taxes are usually much more progressive than the water billing system: it is quite wrong to think that poor people use much less water than rich ones, since the income elasticity is weak. So, at this moment when we discover that some water and waste water tariffs have become unaffordable for part of the population, it is just about time to 'think outside the bill' (AWWA, 2004) and to consider covering part of the full costs in a way corresponding to the common pool nature of water resources.

Beyond the specific case of France and its river basin institutions, this paper aims at showing that implementing the Water Framework Directive with its aiming at recovering the quality of the aquatic environment does not necessarily impose a jump in WSS tariffs in the form of billing, but will need a combination of tariffs, taxes, mutualised service fees including possible transfers between categories of users sharing the same water resource, e.g. payments for environmental services.

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Figures

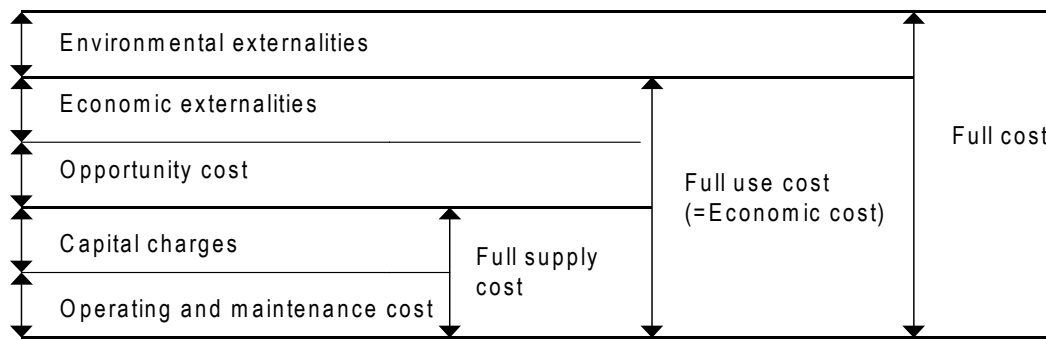


Figure 1: Full cost pricing components (Rogers Bhatia Huber 1998)

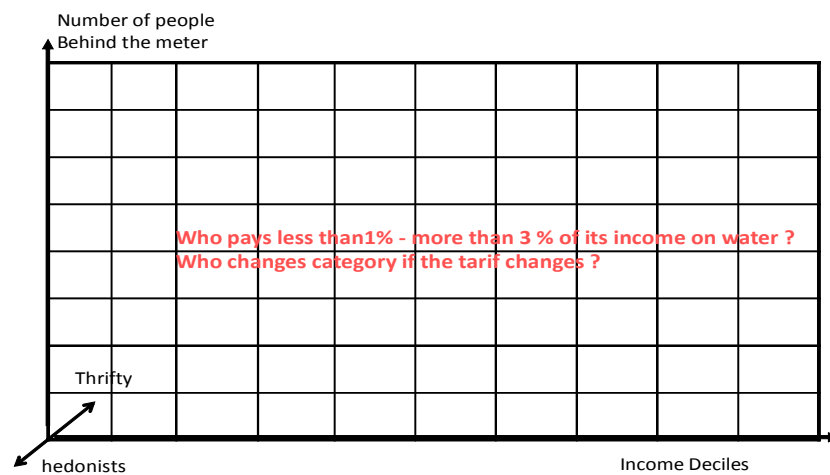


Fig. 2: a software is being developed in ENGEES-Strasbourg to test the social impact of any tariff. In each box one can calculate the yearly water bill, and compare with income.

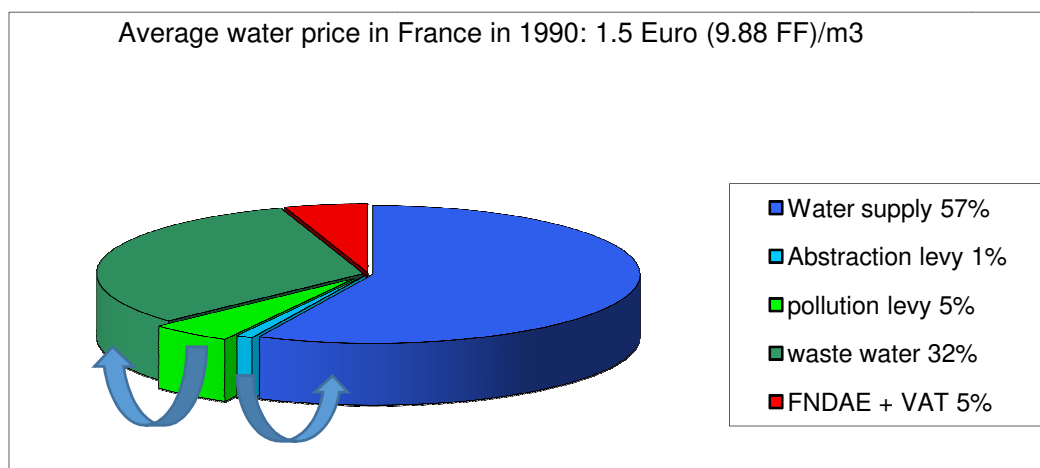


Fig.3: Breakdown of average water price in France before the UWWD: adding pollution levies to wastewater fees and abstraction levies to potable water, allows to illustrate the difference between short term and long term cost, since the agences de l'eau return the money to users investing in water projects.

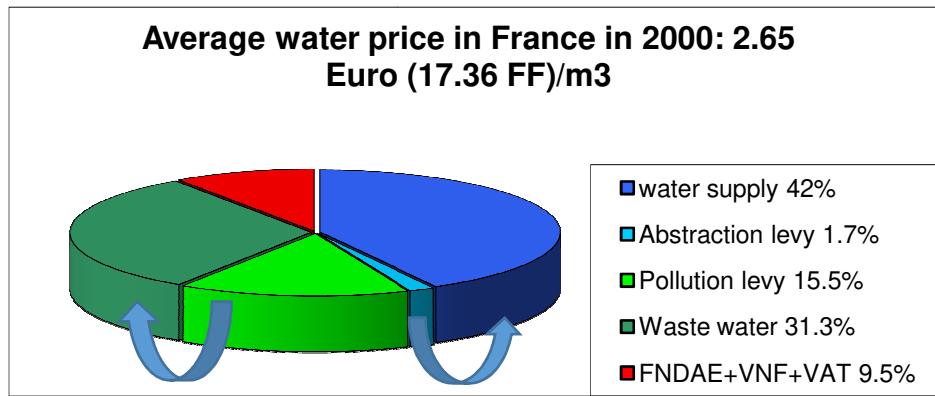


Fig.4: Breakdown of average water price 10 years after the UWWD, showing the impact on the sewer part, which on the long term surpassed the drinking water part in 1996. The levies paid to the Agencies are also an image of full cost recovery, with light green for environmental cost (internalising resource quality management), and light blue for users' cost (internalising quantity management costs)