# **DIPLOMA THESIS**

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# **Implications of European Water Sector Experiences for Innovative PSP Concepts**

The Franchising Approach and its Prospective Application to Peru

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# TO CONSTANZA

# ABSTRACT

Three fundamental research questions form the object of this study. The first question is of explorative nature, aimed at identifying the long-term experiences of European water service provision. After precisely defining the theoretical framework elements, i.e. water supply and sanitation markets (as a subgroup of infrastructure markets), the concept of private sector participation and the theory of developing economies, therefore a detailed literature review was carried out on the most prominent European water sectors, in particular the sectors of the U.K., France, Germany, Spain, Italy, the Netherlands and Austria.

In addition, an empirical survey into the main stakeholders of the described countries was accomplished. 247 companies and institutions, out of the areas academic faculty, public authorities, private enterprises, public enterprises, consultants, NGOs, news media and donor organisations, were asked for their contribution resulting in a response rate of 15%. The applied methodology was an expert email interview, covering three sections, namely an analysis of the lessons learnt out of European experiences, a future outlook for developing countries and a critical discussion of the franchising concept. The results were aimed at finding an answer to research question number two, that is to say, whether these experiences can be applied to design new concepts for developing countries.

Finally, reference was made to the innovative model of franchising and the question, whether it is capable of providing new approaches to developing countries. Based on an in-depth case study of the Peruvian water supply and sanitation sector, the notion's application potential was evaluated in terms of necessity and potential efficiency, and a prospective field of application identified in the rural areas of developing countries. In line with the theoretical origin of the water franchising concept, this is a segment, where so far private water contractors have not been willing to penetrate and where up to now PSP approaches have not proven to be implemented easily.

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# **1** INTRODUCTION

Water is a fundamental human necessity and the provision of water supply and sanitation services is an essential and integrative part of human society dating back to as early as 3000 B.C. Mesopotamia. Today the global consensus regarding water management is based on the Dublin principles (Table 1), elaborated in the course of the 1992 UN Conference on Environment and Development (UNCD Earth Summit) in Rio de Janeiro and the cornerstone for the water section of the Agenda 21.

#### THE DUBLIN PRINCIPLES

**Principle No. 1** - Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.

**Principle No. 2** - Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels.

 $\ensuremath{\textbf{Principle No. 3}}$  - Women play a central part in the provision, management and safeguarding of water.

**Principle No. 4** - Water has an economic value in all its competing uses and should be recognized as an economic good.

Table 1: Dublin Statement on Water and Sustainable Development. Source: International Conference on Water and the Environment (1992: 1).

The number of institutions founded in the wake of the Rio summit is legion. Four 'World Water Forums' took place and many multinational agencies, among them the U.N. and the World Bank, made water one of their core lines of action. On the other hand a host of NGOs formed up to protect the scarce resource, claiming that water is not an economic good but a human need which should be free for every human being on this planet. Despite tremendous efforts, however, particularly the water problems of countries suffering from extreme poverty could not be tackled with. This thesis will therefore try to go back one step by focusing on the experiences of the cradle of modern water service provision, the European water sector, and ask the following research questions:

- What are the long-term experiences of European water service provision?
- *Can they be applied to design new water concepts for developing countries?*
- *Is the concept of franchising such an innovative approach and is it capable of providing new approaches to developing countries?*

# **2** THEORETICAL FRAMEWORK

In order to precisely define the field of study chapter 2 shall illustrate and analyse the conceptual framework provided by economic and political theory. The three main theoretical ideas giving the frame of reference for this thesis are the concepts of water supply and sanitation markets (as a particular sub-group of infrastructure markets), the notion of private sector participation and the theory of developing economies. These three lines of thought synthesize the innovative approach of franchising.



Figure 1: Theoretical Framework.

### 2.1 Theory of Water Supply and Sanitation Markets

Water supply and sanitation markets (in the following referred to as water markets) are social institutions which bring together suppliers and demanders of infrastructures in the form of the supply of fresh water (for municipal and industrial use) and the disposal of waste water. The water markets thereby provide a forum for the exchange of water infrastructure goods and services. Water supply and sanitation systems are complex technical facilities which generally are divided into four sub-groups, i.e. water treatment plants, water supply networks, sewage collection networks and sewage treatment plants. Figure 2 gives an overview of the several technical systems involved in a modern water management system. For an introductory overview on engineering and construction aspects of water systems refer to Degremont (1991) and Grombach (2000).

A review of relevant literature shows clearly that water supply and sanitation, as the good provided in water markets, is a sub-class of the much wider concept of infrastructure (Frey 1978: 202, Staats-Lexikon 1987: 79, Bloech 1989: 639, Klemmer 1993: 984 and Wolter 1997: 31).



Figure 2: The Water Supply and Sanitation Sector.

# 2.1.1 Definition of Infrastructure

The term infrastructure is applied, both in everyday and in scientific language, in a wide range of forms and the meaning (intension and extension (Wolter 1997: 25)) attributed to the word can differ significantly depending on the theoretical background of the research under review. The term originated as a matter of fact from military language in 19<sup>th</sup> century France where it denoted the base structure of the organisation (ibid) and basic military installations.

It was not until the late fifties of the 20<sup>th</sup> century that the notion of infrastructure sparked an interest to the international scientific community. The most important authors of this time were Hirschman (1958), Tinbergen (1963), Jochimsen (1966), Jansen (1967), and Frey (1970). A comprehensive review of these pioneer attempts of infrastructure definition was elaborated by Filzen (Filzen 1982: 19-50). Most modern economists build their concepts based on the notion of Jochimsen, whose

definition has proven to be the most cited over the last decades. Pursuant to the German economist, infrastructure is defined as follows:

"the sum of material, institutional and personal facilities and conditions [...] which are available to the economic units and contribute to the normalisation of remuneration for equal factor inputs and appropriate allocation of resources, i.e. complete integration and highest possible level of economic activity" (Jochimsen 1966: 100).

*Material infrastructure* in this concept refers to the totality of plants, equipment and other physical capital stock of an economy as needed for energy generation and distribution, telecommunication, transport or the buildings of public administration (ibid: 103). Jochimsen puts energy supply and the traffic system at the core of his notion (ibid: 105).

*Institutional infrastructure* comprises the entirety of standards and norms of a society together with institutions such as public administration, police and the judiciary necessary for the enforcement of said rules (ibid: 117). It corresponds to the non-physical environment and provides the framework within which the economic subjects formulate their own economic plans and engage in economic activities (ibid).

*Personal infrastructure* embraces the "intellectual, entrepreneurial, technical and other skills of the people" (ibid: 133) and thus refers to the human capital - in quantity and quality - that contributes directly to the level and integration of economic output. This includes general education, specialisation, and qualification of people in varying functions and their sectoral and spatial distribution (ibid).

A further classification of infrastructure refers to the distinction between *productive* (i.e. firm oriented) and *consumptive* (i.e. household oriented) infrastructure (Frey 1979: 20). Although an exact assignation to one of the two categories will not be possible due to the dual character of many infrastructures, it can be generalised that the first term includes the traffic system, energy supply, water supply and sanitation and the waste disposal. The second variety thus encompasses schools, universities, the health care system as well as social and cultural facilities.

From a structural point of view infrastructure can be categorised into *punctiform* and *retiform* infrastructure (Scheele 1993: 19). The first variety refers to individual plants with a determined geographical distribution (airports, sea ports, power plants, water treatment plants etc.), whereas the latter focuses on the connections between the specific points (streets, sewage networks, telecommunication networks, rails etc.). In particular for the retiform variety economic theory has assumed a strong tendency towards sub additivity and sunk cost (Wolter 1997: 66), characteristics which will be dealt with later in this thesis and which are at the core of the peculiarities associated with infrastructures.

Finally infrastructure is classified into *core* infrastructure and *peripheral* infrastructure. Core infrastructures are defined as infrastructures with strong productivity effects (Strohbach 1999: 15) and encompass areas such as the traffic system, public transport, airports, electricity and gas supply, water supply and the sanitation system.

### 2.1.2 Infrastructure Sectors

A classification into infrastructure sectors has been carried out by many authors, the results not being very homogeneous. In general no explicit criteria are applied to categorize the various areas of infrastructure but rather casuistic approaches are used (Busch and Klös 1995: 28, Wolter 1997: 31). This thesis will follow the pragmatic (and not theoreticalsystematic) concept as presented by the Worldbank Infrastructure Network (Worldbank 2006a).

ENERGY	Production, Transmission & Distribution of Electricity, Heat and Gas
ICT	Local & Long-Distance Communications, Value-added Services
OIL, GAS & MINING Exploration, Refining and Processing	
TRANSPORT	Rail infrastructure, Cargo & Passenger Transport, Local Buses & Trains, Country Roads, Highways, Motorways, Urban Streets, Sea Ports, Airports, Bridges, Tunnels
URBAN DEVELOPMENT	Education, Health Care, Waste Disposal, Public Security, Cultural & Social Institutions, Environment Protection
WATER SUPPLY AND SANITATION	Water Treatment Plants, Water Supply Networks, Sewage Collection Networks, Sewage Treatment Plants

Table 2: Infrastructure Sectors. Based on data from Worldbank (2006

Based on data from Worldbank (2006a).

# 2.1.3 Characteristics of Water Markets

Most authors differentiate *technical*, *economic* and *institutional* characteristics when it comes to describe the features of infrastructure

(Wolter 1997: 33); Table 3 summarizes the attributes most commonly assigned to them and selected as the basis for the further analysis of the water sector. The reason why infrastructure policy requires particular attention is that some of the given characteristics make the infrastructure sectors fulfil one or more conditions of market failure, i.e. a situation where the market will not automatically generate the socially optimal and desired result. A detailed analysis of the peculiar features of the water supply and sanitation sector will be provided in chapters 2.1.4, 2.1.5 and 2.1.6. A literature review provided by Strohbach (Strohbach 1999: 19) illustrates that, although some differences can be found in the determination of the features, many characteristics chosen for this study have been repeatedly referred to picture the notion of infrastructure. His findings can be assumed to affirm the selection of the variables carried out in Table 3 to describe the concept of the water market.

TECHNICAL FEATURES	ECONOMIC FEATURES	INSTITUTIONAL FEATURES	
<ul><li>Indivisibility</li><li>Immobility</li><li>Long Lifetime</li><li>Input character</li></ul>	<ul> <li>High Capital-Output Ratio</li> <li>High Fixed and Fixed- Step Costs</li> <li>Natural Monopoly</li> <li>Club Collective Good</li> <li>External Effects</li> </ul>	<ul> <li>Absence of Market Prices</li> <li>Regulation</li> <li>Governmental Decision- Making</li> </ul>	

Table 3: Main Characteristics of Water Markets.

# 2.1.4 Technical Features

### 2.1.4.1 Indivisibility

Generally speaking infrastructure is not divisible in any arbitrary manner, since for technical reasons typically a minimum size or output is required. The determination of total capacity may not be based on marginal demand but has to be designed for average demand ("Infrastruktur"). The degree of indivisibility denotes the relative capacity of an infrastructure and is defined as the cost of capacity reduction. High divisibility costs simultaneously imply high capacity extension costs (Strohbach 1999: 19). Indivisibility is sometimes also referred to as "lumpiness" (Büschgen and Ergenzinger 1993: 32) and correlates strongly with other characteristics of

infrastructure such as high fixed costs and the high utilisation risks involved (Frey 1979: 18). Degrees of indivisibility may differ substantially in different infrastructure sectors, with retiform infrastructures normally exhibiting higher degrees than punctiform ones (Tuchtfeldt 1970 128).

Water and sewage treatment plants show high degrees of divisibility. Modern technology makes it possible to design plants in nearly whatever size required for a certain application and processes such as membrane systems allow for modular plant concepts which may be extended according to demand almost gradually. Networks (both water supply and sewage collection), however, have to be considered indivisible to a great extent. Due to the engineering aspects involved in piping network construction, extension or reduction of the network results in particularly high cost, if at all feasible from a technical point of view.

#### 2.1.4.2 Immobility

Immobility denotes the technical and/or economic incapability of moving or being moved, where the latter variety refers mainly to situations, where principally relocation is possible, but cost to be incurred is the prohibitive factor. Technical immobility involves mainly civil constructions such as roads, bridges or buildings, although due to modern technology the difference has become blurred in many cases. Infrastructure comprises always a spatial component, which means it is related to a geographical unit, which may be a municipality or region but also a country or a continent as a whole (Wolter 1997: 47). The utility of the infrastructure is therefore restricted to its location and the surrounding area (Klös 1989: 12). Particularly immobile are sectors such as transport, energy and telecommunications, where large construction works are involved.

Traditional technology water and sewage treatment plants require large civil works constructions, including vast quantities of concrete and can be considered definitely immobile. The same applies to networks, where though single pipe components may be relocated, the network as a whole has to be maintained at its location. An exception to this rule are small mobile treatment units which may be installed on trucks and applied wherever needed, e.g. in the case of disasters. On a municipal level it is however basically impossible to transfer more than small components (such as pumps or valves) of water infrastructure.

# 2.1.4.3 Long Lifetime

Infrastructure investments are typically large size projects with extraordinary long development periods and lifetimes (Tuchtfeldt 1970: 129), a fact that contributes considerably to the risk profile of investment decisions. Unfavourable infrastructure investments may prove difficult to correct in the short term and, due to the long-term planning horizon, may have substantially adverse affects on the economy as a whole. The long life-cycles imply also that sometimes investments have to be financed by one generation, but utilisation takes place over various generations (Strohbach 1999: 20). Since capacity has to be determined based on future demand, a considerable element of uncertainty is attached to such decisions. Private investors may not be prepared to take the total risk associated with infrastructure investments. Lifetimes of infrastructures may vary, depending on the technology involved. Telecommunication installations may have a lifetime of below ten years, whereas networks for water supply and sewage collection have investment horizons of well above thirty years (Strohbach 1999: 20). In principle there is a strong tendency towards shorter technology cycles, but also towards more durable goods, resulting in a trade-off regarding lifetime of the products.

### 2.1.4.4 Input factor

According to Jochimson (chapter 2.1.1) infrastructure provides the basis for economic activity and integration and therefore constitutes the elementary configuration of an economy (Tuchtfeldt 1970: 128). Economic theory uses production functions to describe the relationship between the quantities of inputs needed to produce a certain quantity of output of a product. An input thereby is defined as anything that a firm uses in its production process (Mansfield and Yohe 2004: 205). Conventional economics nevertheless did not consider the effects of infrastructure as an input factor, although a big part of a company's production efficiency can be attributed to infrastructure installations such as energy, water, transport or telecommunications networks. Modern economists try to integrate the input potential of infrastructure into their production functions in order to model the productivity and growth effects associated with such installations. Based on the publication of Aschauer (Aschauer 1989: 171), who used a Cobb-Douglas production function, the question of how to quantify the effect of government infrastructure expenditure on private sector output has become the subject of a controversial debate (Felipe 2001: 323). It is however an undisputed matter of fact that water infrastructure contributes considerably to a region's productivity and industrial development.

#### 2.1.5 Economic Features

#### 2.1.5.1 Capital-Output Ratio & Cost Structure

The capital-output ratio (COR), as reciprocal value of the capital productivity, refers to the ratio of capital input (C) and aggregate economic output ( $Y_r$ ). The average COR is calculated by dividing the real gross domestic product into the capital stock ("Kapitalkoeffizient").

$$COR = \frac{C}{Y_r}$$

Compared with future forecasted returns most infrastructures require large initial investments, a fact that results in high economic and technical risks, since the initial outpayment has to be compensated by uncertain inpayments over a long and unpredictable period (Strohbach 1999: 22). The vast majority of water infrastructures therefore can be considered to have higher-than-average capital-output ratios.

Regarding the typical cost structure high fixed costs and the existence of fixed-step costs are attributed to water infrastructures. Fixed costs are defined as costs which do not change with variations of a reference parameter - normally the activity of a firm ("fixe Kosten") – and are dependent on the period of time under review. In the long run virtually all costs – except for sunk costs – become variable.

Sunk costs, sometimes referred to as irreversible costs, are costs already incurred at some point in the past and not recoverable to any significant degree ("sunk cost"). The existence of high sunk costs constitutes a considerable market exit barrier, in which case a firm would have to write down a major part of its assets. Irreversibility occurs when there are no alternatives of utilisation, i.e. when resources are restricted to a certain type of application (Wolter 1997: 61). Water networks, whose only purpose is to transfer water, are a case in point and many types of infrastructure show similar characteristics. A second, even more important effect of sunk costs is that they additionally serve as market entry barriers, since at the time of taking the decision to enter a new market, a firm has to decide on the incurrence of considerably high sunk costs which will not be recoverable in case the market entry is not successful (ibid). Sunk costs contribute substantially to the risk profile of water infrastructures and play an important role in the theory of natural monopolies.

Fixed-step costs are constant within certain reference parameter intervals, but jump to a higher or lower level when passing the limits. In the case of water infrastructures this phenomenon can be observed, since when demand exceeds existing capacity, extension investments have to be accomplished, leading to fixed-step costs (Strohbach 1999: 22).

#### 2.1.5.2 Natural Monopolies

Economic theory applies the term "market failure" when referring to scenarios in which markets fail to produce efficient outcomes, i.e. circumstances under which markets are not Pareto efficient. Pareto efficiency is named after Vilfredo Pareto, a 19<sup>th</sup> century Italian economist, who was one of the first to study economic efficiency.

"If we can find a way to make some people better off without making anybody else worse off, we have a Pareto improvement. If an allocation allows for Pareto improvement, it is Pareto inefficient; if an allocation is such that no Pareto improvements are possible, it is called Pareto efficient." (Varian 2003: 15)

According to Stiglitz six categories of market failure exist, i.e. imperfect competition, public goods, externalities, incomplete markets, imperfect information and unemployment and other macroeconomic disturbances (Stiglitz 2000: 85). Baumol names seven major imperfections and refers to inequality of income distribution, fluctuations in economic activity (inflation and unemployment), monopolistic output restrictions,

beneficial and detrimental externalities, inadequate provision of public goods, misallocation of resources between present and future and the deteriorating quality and rising costs of personal services (Baumol and Blinder 2004: 249). Although the typologies as found in literature differ up to a certain degree, three features, characteristically for infrastructures, are always mentioned, i.e. *natural monopolies, public goods* and *externalities*.

For a market to be Pareto efficient there must be perfect competition, when a single firm supplies the market, economists refer to it as a monopoly. One special case is the natural monopoly, where according to classical economic theory the limitation of competition arises from two sources: economies of scale and economies of scope. Economies of scale refer to a situation where average cost decreases with the expansion of output and typically imply the existence of high fixed costs.

"The critical and – if properly defined – allembracing characteristic of natural monopoly is an inherent tendency to decreasing unit costs over the entire extent of the market. This is so only when the economies achievable by a larger output are internal to the individual firm – if, that is to say, it is only as more output is concentrated in a single supplier that unit costs will decline" (Kahn 1971: 119).

It is, however, possible that economies of scale exist only over a certain range of output, while further increasing output results in diseconomies of scale and a U-shaped average cost curve.



Figure 3: Economies and Diseconomies of Scale.

The existence of a natural monopoly depends on the range of economies of scale relative to market demand. In the one-product case at any division of output production with two firms has to cost more than with one firm (Train 1991: 7). In such a case economic efficiency requires only one firm to operate the market. Hence the overall cost situation has to be taken into consideration and economists apply the term subadditivity for this purpose. "A cost curve is said to exhibit subadditivity at a given level of one or more outputs if the cost of producing these outputs is lower with one firm than with more than one firm, regardless of how the output might be divided among the multiple firms" (Train 1991: 11).



Figure 4: Natural Monopoly (One Product).

Under competition efficiency would require the price to be set to equal marginal cost (at  $Q_0$ ), but in a situation as represented in Figure 4, i.e. in case of a natural monopoly, the firm would make a loss since marginal cost is lower than average cost. The maximum viable output is  $Q_1$ , where average cost intersects with the demand curve. In practice, many governments force the utility to operate at marginal cost, using subsidies to compensate for the losses. This approach however disregards the problem of asymmetric information, which raises the problem of the amount of subsidies for the utility to operate at the zero profit point. It therefore has proven to be more manageable to operate the utility at  $Q_1$  to avoid having the general taxpayer coming up for the difference, with only a portion of the population actually taking up the services (Stiglitz 2000: 192). Classical theory requires these markets to be regulated in price and output quantity in order to remedy market failure and secure efficiency.

The foregoing is particularly true under the assumption that there are potential entrants to the market, who would enter, in case the monopolist charges prices higher than average cost in order to operate above the zero profit point and capture a profit for itself. The picture changes when considerable sunk costs are involved, which create a substantial asymmetry between the firm established in the market and the potential entrant (ibid). Contestability theory, developed by Baumol, Panzer and Willig in the early 80s, states, along with economies of scale, the irreversibility of investments as a second criterion for natural monopolies (Baumol 1982: 1). At the time of taking the decision to enter the market the new firm has to consider the market price after its entry, which, assuming a reaction of the monopolist, will be lower than before the entry and making the entry no longer profitable. On significant levels of sunk costs the potential entrant might worry that entry costs might not be recoverable, hence a market entry barrier is created (Stiglitz 2000: 193). A monopolist unconcerned with the threat of a competitive entry is able to operate at  $Q^*$ , where marginal cost equals marginal revenue.

		IRREVERSIBILITY	
		LOW	HIGH
	NO	"normal" market	cut-throat competition
SUBADDITIVITY	YES	contestable monopoly	natural monopoly

Figure 5: Irreversibility and Subadditivity Matrix.

The theory of contestable markets therefore provides an extended analysis compared with classical theory. In the case of low irreversibility it states that no regulation is required and has hence given the groundbreaking theoretical basis for modern political attempts to deregulation (Spelthahn 1994: 29). Some authors have even questioned the existence of natural monopolies (the "myth of natural monopoly") and argue that the theory of natural monopoly is abused as ex post rationale for government intervention (DiLorenzo 1996: 43).

In the case of more than one good being produced, natural monopolies can emanate not only from economies of scale, but also from economies of scope (Train 1991: 8). The production of multiple products is sometimes possible with shared equipment or common facilities making the joint production less expensive than producing them separately. Economies of scope therefore are said to exist "if a given quantity of each of two or more goods can be produced by one firm at a lower total cost than if each good were produced separately by different firms" (ibid). Economies of scope and economies of scale are two separate phenomena which may exist together but may also appear individually.



Figure 6 Economies of Scope

The origin of the theory of natural monopolies is generally attributed to John Stuart Mill who in 1848 wrote in his "Principles of Political Economy":

"It is obvious, for example, how great an economy of labour would be obtained if London were supplied by a single gas or water company instead of the existing plurality" (Mill 1871: 88).

Mill justifies his ideas by referring to the economies of scale of gas and water networks which threaten competition and argues for the public service of water and gas supply (ibid). Among the first to claim regulation of natural monopolies was the American economist Henry Carter Adams who wanted to allow for a trade-off between economies of scale and therefore cheaper production and customer protection against monopoly power and abuse (Sharkey 1982: 15). In many cases the feature to be a natural monopoly lies at the heart of a multitude of problems associated with infrastructures as well as private sector participation in them. Hence several regulative mechanisms have been developed in order to remedy the market failure as described in the foregoing.

In conclusion it can be affirmed that the networks for water supply and sewage collection fulfil both criteria necessary for the classification as natural monopoly, whereas water and sewage treatment plants do not. One could now conclude that the unbundling of plants and networks would result in efficiency improvements as it is the case in the unbundling of electricity markets. The prevailing argument in favour is that individual segments of the water market (such as treatment plants) could be opened up to competition and would perform more efficiently (Rudolph et al. 2005: 26). The particularity of water, in comparison to electricity, is however that water comes in a multitude of qualities, which would be mixed arbitrarily upon feeding into the network. Additionally, long distance transport of water is energy intensive and changes the water quality (Brackemann 2000: 33). Physical unbundling hence proves difficult to be handled, a possible solution could nevertheless be operative unbundling, where specific tasks within the water system are re-organised and assigned to specialised enterprises (Rudolph et al. 2005: 28).

### 2.1.5.3 Club Collective Goods

The public character of goods is classified by means of two criteria, i.e. the degree of excludability and the degree of rivalry. A public good according to this categorization is nonrival and nonexclusive. Nonexcludability means that consumers cannot be excluded from the consumption of the good, no matter if they pay for it or not. Nonrival refers to a good where the marginal cost of providing it to an additional consumer is zero (Mansfield and Yohe 2004: 668). One of the founders of modern neoclassical economics, the American economist Paul A. Samuelson, was the first to contribute to the theory of public goods. In his 1954 paper "The Pure Theory of Public Expenditure" he distinguishes between

"private consumption goods which can be parcelled out among different individuals [...] and collective consumption goods which all enjoy in common in the sense that each individual's consumption of such a good leads to no subtraction from any other individual's consumption of that good" (Samuelson 1954: 387).

According to neoclassical economics for a private good economic efficiency requires that each consumer's marginal benefit equals marginal cost, while for a public good the sum of the benefits of all consumers has to equal marginal cost (Mansfield and Yohe 2004: 670). For a public good this condition is generally difficult to meet since people do not normally reveal their true preferences. Since individuals have more information on their own tastes than the government there is a natural incentive to use this information strategically in some situations (Batina and Ihori 2005: 1).

With his "Economic Theory of Clubs" the American economist James M. Buchanan intends to "move one step forward in closing the Samuelson gap between the purely private and the purely public good" (Buchanan 1965: 1). By adding excludability to Samuelson's criterion of rivalry he provides the basis for the four combination matrix as shown in Figure 7. Most infrastructures, contrary to public opinion, are not public goods but club collective goods (Strohbach 1999: 27). Customers who are not willing to pay may be excluded from the service.

		EXCLUD	ABILITY
		YES	NO
	YES	private good	common pool good
RIVALKI	NO	club collective good	public good

Figure 7: Excludability and Rivalry Matrix.

There are two basic forms of market failure associated with club collective goods and public goods respectively, i.e. underconsumption and undersupply (Stiglitz 2000: 129). In the case of club collective goods governments tend to charge user fees to those who benefit from the provision of the good (toll roads are a case in point) which leads to underconsumption (ibid: 130). The setting is different for public goods where no consumer can be excluded from the provision and individuals are reluctant to contribute voluntarily to the finance of the good. The problem associated with this situation is called the "free rider problem" and denotes the unfeasibility of rationing of a good by the price system. It is rational for an individual not to pay for a service if it cannot be excluded from it anyway. In general governments tend to force individuals to support these goods through taxation and consequent subsidization. Private markets would either not supply or produce an insufficient amount of public goods (ibid: 131).

For the excludability of many goods emphasis is not on the feasibility of rationing, but the cost of exclusion, i.e. the so called

transactions costs. Among the first to analyze the problem of externalities was the Nobel Prize-winning economist Ronald H. Coase, who argued that the allocation of correct property rights and the absence of transaction costs would solve many problems associated with the provision of public goods (Coase 1960: 1). Parties responsible for a certain externality can then negotiate with the ones affected by them and an efficient allocation based on market mechanisms takes place. The Coase theorem has attracted considerable attention but also substantial criticism since it assumes relatively small costs of negotiation. When a relatively large number of parties is involved, negotiation cost may become prohibitively high and the market failure persists (Mansfield and Yohe 2004: 685).

Public goods must not be confused with publicly provided goods since any good out of the four field matrix may be supplied by the public sector. If, for example, the marginal cost associated with supplying additional individuals with a private good is large, the public may supply some of those goods, such as in the case of education (Stiglitz 2000: 136). The three methods of rationing publicly provided private goods are charging user fees, uniform provision and queuing (ibid: 140).

A specific category of goods are merit goods where private supply would be possible but where the market result is considered politically inefficient. Preferences of the customers are therefore corrected, based on a political decision. In the case of the health care system or cultural institutions demand is adjusted upwards, whereas the opposite is true for goods such as alcohol, drugs or gasoline (Wolter 1997: 65).

Water, as a good, comes in different forms and each particular form has its proper characteristics concerning the public good character. Figure 8, in addition, may possibly change depending on the geographical region under review. Particularly, the degree of rivalry is contingent upon the quantities available of a certain good in a certain area. Arid regions will apply different criteria than seaside ones. It becomes clear, however, that clean water supply infrastructure services, as analysed in the context of this diploma thesis, (i.e. the supply of tap water) fall into the matrix category of club collective goods. The same classification applies for the provision of sanitation services.



Figure 8: Good Classification of Water. Adapted from Scheele (1993: 29).

### 2.1.5.4 External Effects

External effects, or externalities, are market failures, where "an individual or firm undertakes an action which has an effect on another individual or firm, for which the latter does not pay or is paid for" (Stiglitz 2000: 215) and cause inefficiency in the resource allocation of a market. Externalities may be positive or negative, i.e. a benefit or a cost for the affected party.

"An activity is said to generate a beneficial or detrimental externality if that activity causes incidental benefits or damages to others not directly involved in the activity and no corresponding compensation is provided to or paid by those who generate the externality" (Baumol and Blinder 2004: 416).

The originating and the affected party find themselves in a relation not connected via market und price mechanisms. The consequence is that an overproduction of goods generating negative externalities and an undersupply of goods generating positive externalities takes place (Stiglitz 2000: 216). Infrastructure exhibits a considerable extent of, both, social benefits and social costs (Tuchtfeldt 1970: 128). Since many infrastructure goods are provided for free to the individual users by the government and financed by general taxation, positive externalities arise to the users. A case in point for negative externalities would be the subsidence of the ground water level and the subsequent decrease in the productivity level of the surrounding farmland due to the construction of a channel (ibid).

Klös argues that particularly the input character of many infrastructures is basis for the existence of social benefits. Education and health care system are solely designed to give services below cost to the majority of the population. Without having these goods publicly provided, politically unacceptable low amounts of those goods would be supplied (Klös 1989: 15). However, he proceeds by stating that a complete market failure in infrastructures should not be presumed due to the comprehensive body of fiscal – not interventionist – corrective instruments (internalisation), applicable within the market system (ibid). Besides, many externalities are not relevant since they are not even perceived as such by third parties. By referring to Coase (chapter 2.1.5.3), Klös alludes to the necessity of a property rights reform in order to overcome externality problems (ibid: 16). The club collective good character of infrastructures facilitates this approach since the restricted number of club members reduces negotiation cost (ibid: 17).

# 2.1.6 Institutional Characteristics

A useful starting point for the analysis of institutions is the so-called fourlayer model of Williamson (Künneke et al. 2005: 3). The four layers show the various perspectives of institutions, considering the whole range from Original Institutional Economics, via New Institutional Economics to Neoclassical Economics (ibid). Level one refers to the informal institutions such as norms, customs and traditions, which are the domain of sociology and history, and provides the basis for the higher-level formal institutions. The second level puts the premium on the legal framework, and prominently on property rights, to be provided by the government in the form of polity, judiciary and bureaucracy (Williamson 1998: 27). Douglass C. North, who focused his work on institutional change and the related economic performance, refers to L1 and L2 institutions as follows:

"Institutions are the humanly devised constraints that structure political, economic, and social interactions. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights)" (North 1991: 97).

Level three is dedicated to the institutions and structures of governance, i.e. different modes of organizations and firms and alternative market structures. Transaction cost economics constitute the core of this layer (Künnecke et al. 2005: 4). At the highest level, the fourth layer, neoclassical resource allocation takes place. Price and output are continually adjusted in order to adapt to changing market conditions (Williamson 1998: 29).



Figure 9: The Four-Layer Model of Institutions. Adapted from Williamson (1998: 26).

The impact of informal institutions on the design of infrastructure markets is evident. Traditions and codes of conduct influence the establishment of formal institutions but also have direct effect on economic behaviour (North 1992: 43). It is however questionable to which extent informal institution can be changed by public policy. In many poor regions informal institutions, such as community networks, due to the absence of (or non-access to) formal institutions, are the only relevant ones and may even be superior to the formal alternatives. Although they sometimes are more efficient, in other cases they may impede further market development. The replacement of informal institutions by formal ones may nevertheless bring about high transaction costs if policy makers do not carefully adjust the pace of change (Worldbank 2002: 179).

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The institutional characteristics of water infrastructure may be directly derived from its technical and economic features. Among its most salient attributes are the *absence of market prices, governmental regulation* and *governmental decision-making* (chapters 2.1.6.1, 2.1.6.2 and 2.1.6.3).

# 2.1.6.1 Absence of Efficient Market Prices

The absence of efficient market mechanisms and associated market prices has to be attributed on the one hand to the natural monopoly character of infrastructures and on the other hand to the nonexcludability of some infrastructure goods, hence its public good character. In order to avoid the market to fail or resources to be allocated in an inefficient way, governments try to intervene by means of regulation (chapter 2.1.6.2).

Tuchtfeldt refers to the indivisibility, the long life time and the low profitability of infrastructures in his explanation of the collapse of the price mechanism. Consumer sovereignty could even give rise to macroeconomic malfunctions in the education and health care system, if individual preferences were not collectively adjusted by the government (Tuchtfeldt 1970: 129).

The traditional approach, as justification for the public provision of many infrastructures or the connivance of so-called natural monopolies, has become obsolete in various cases. By means of unbundling, many infrastructure sectors have been opened up to competitive private sector participation (Rudolph et al. 2005: 26). The natural monopoly character of a multitude of infrastructure sectors has become questionable and most infrastructure goods have proven to be club collective goods instead of non-exclusive public goods.

The political desirability and the economic feasibility of free interplay of demand and supply in infrastructure markets has become one of the most disputed issues of today's global politics. The framework of discussion is however ideological and not based on solid economic arguments. Authors, as Barlow and Clarke (2004) and Hall and Lobina (2006), use the general public's fundamental fears to mobilize against multinationals such as Suez or Veolia in a pseudo-scientific way, losing track of a way to find a dialogue to jointly design sustainable solutions for

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the world's water problems. Market mechanisms are far from being a panacea, but it is a fact that public discussion has become purely political, without trying to elaborate on a sound and fact-guided discourse.

# 2.1.6.2 Regulation

Regulation denotes the active governmental intervention into market mechanisms when competition cannot be relied upon to achieve efficient allocation of resources. Microeconomic theory generally refers to market failures such as natural monopolies, public goods and external effects to justify regulative measures, which are situations where social surplus (as sum of producer and consumer surplus) is not maximized, i.e. when price does not equal marginal cost (Spelthahn 1994: 53). The main focus of regulation is normally on the price, but also market access and quality are subject to public influence.

# 2.1.6.2.1 Regulation of Natural Monopolies

In the case of natural monopolies Hirschhausen refers to the structural level of regulation where he distinguishes between the structural variety, i.e. unbundling and regulation of the core, and conduct regulation, i.e. regulation of the vertically integrated enterprise. On an instrument level he establishes three categories, i.e. internal regulation, external regulation and competitive solutions (Hirschhausen 2001: 12)

INTERNAL REGULATION	EXTERNAL REGULATION	COMPETITION FOR THE FIELD
<ul> <li>Public Enterprise</li> </ul>	<ul> <li>Price Regulation</li> </ul>	<ul> <li>Tendering</li> </ul>
	<ul><li>Direct</li><li>Indirect</li></ul>	<ul> <li>Yardstick Competition</li> </ul>
	<ul> <li>Quality Regulation</li> </ul>	
	<ul> <li>Market Access Regulation</li> </ul>	

Table 4: Natural Monopoly Regulation. Based on data from Hirschhausen (2001: 13).

Internal regulation denotes a scenario where a public enterprise is directly responsible for the provision of the infrastructure good or service and therefore the government has direct influence on the managers of the utility. They may be directed to the desired behaviour in order to establish economic efficiency without any intermediate regulative mechanisms. In case the utility is not a public entity external regulation or competition for the field may take place in order to prevent the private company from exploiting its monopolist status (Strohbach 1999: 29). The two classical forms of price regulation are the rate-of-return approach and the price-cap model (Spelthahn 1994: 63), which both are considered to be indirect measures, which means that the monopolist is free to set his prices within the framework given to him by the regulator.

Among the first to study the behaviour of regulated natural monopolies were Averch and Johnson (Averch and Johnson 1962: 1053) who put the premium of their research on the rate-of-return (ROR) regulation (dominant in the US at that time). The price is defined as a predetermined percentage of return on the capital invested, which leaves open the question of an appropriate return for the utility (Spelthahn 1994: 63). Rate-of-return regulation has been criticised for giving incentives for overcapitalization and hence the increase of the calculation basis for the return (Averch-Johnson effect) and its failure to induce cost reduction and technological innovation, hence its economical inefficiency (Waterson 1988: 85). This finding gave rise to numerous creative proposals for improved regulatory procedures, among them return-on-cost (ROC) regulation, return-on-sales (ROS) regulation and return-on-cost (ROC) regulation (Train 1991: 70).

Price-cap regulation (RPI-X regulation) was designed and introduced by UK economist S. Littlechild in the 1980s and consequently applied to the privatization of the British utilities and also adopted by the US administration in several cases (Acton and Vogelsang 1989: 369). The regulator sets a price ceiling and the firm may set its price below or equal to this cap and retain the profit earned at that price. At longer intervals (4-5 years) price caps are reviewed and possibly changed by a preannounced adjustment factor exogenous to the firm (ibid: 370). The adjustment factor (RPI-X) is calculated as inflation (RPI = retail price index) minus a factor X which is government determined and considered to reflect the firm's efficiency (Spelthahn 1994: 64). In special cases X may be supplemented by a positive factor Y to represent high future investment cost, such as in the case of water network rehabilitations (ibid). Traditionally RPI-X regulation was considered to be superior to ROR regulation for the firm's incentive to perform efficiently. Practice, however, has shown that the results of both methods are similar, since governments tend to use ROR numbers when determining the price-caps (Alexander and Irwin 1996: 1).

Direct price regulation refers to situations where the government fixes prices directly without giving any margin of adjustment for the firm. Marginal cost prices complemented by subsidies have the advantage of being economically efficient but give no incentive for cost reduction and can promote cross-subsidies in the case of multi-product firms. Price differentiation is possible on an individual basis (first degree) or based on the size of consumption (second degree). Ramsey prices (named after the British Mathematician Frank P. Ramsey) constitute the "second-best" outcome of a monopoly, being the most efficient point allowing the firm to earn at least zero profits. Split tariffs divide the rate into a fixed charge and a marginal charge which allows for a wide range of possible pricing strategies (Hirschhausen 2001: 15).

A further important variable of regulation is the quality of products produced by the regulated firm and the technology applied to this process (Wolter 1997: 74). Especially in the treatment of drinking water or disposal of sewage a multitude of national and international standards, laws and norms restrict the firm's decision leeway considerably in order to maintain certain health and security standards. In this context the legal framework for the protection of the environment has to be considered.

Access regulation is the second classical key issue in natural monopoly regulation, which deals with the problem of market entry barriers (Wolter 1997: 74). A barrier to entry is "a structural characteristic of a market that protects the market power of incumbents by making entry unprofitable" (Church and Ware 1999: 487). Cases in point are economies of scale, switching costs, brand loyalty, capital costs, and asset specificity (Mcaffee 2003: 20). In the case of infrastructure market access regulation the question lies upon whether and how potential competitors shall be granted access to a certain market or not. Depending on the structural peculiarity two possibilities arise: in case of vertical unbundling, regulation is reduced to the core area, i.e. the network, and the remaining facilities can be opened to competition. However should the network remain vertically integrated, third party access has to be granted in return for a remuneration which can be based on incremental costs only or incremental cost plus the opportunity costs of the foregone downstream business (efficient-component-pricing-rule) (Hirschhausen 2001: 19).

Besides internal and external regulation a third approach has been elaborated, which is the category of competitive solutions such as tendering and yardstick competition. Tendering goes back to as early as 1859 when the British economist Edwin Chadwick proposes

"as an administrative principle, competition 'for the field', that is to say, that the whole field of service should be put up on behalf of the public on competition, - on the only condition on which efficiency, as well as the utmost cheapness, was practicable, namely, the possession, by one capital or by one establishment, of the entire field, which could be most efficiently and economically administered by one, with full securities towards the public for the performance of the requisite service during a given period" (Chadwick 1859: 385).

Interestingly already Chadwick based his ideas on observations of the water supply and sanitation sector. A hundred years later Harold Demsetz took up his ideas to develop a tendering model where competition "in the field" was replaced by competition "for the field" and regulation was reduced to the provision of a legal and institutional framework in which competition could take place efficiently (Demsetz 1968: 55). Under the name of "franchise-bidding" or "franchising" interested firms participate in an auction for the exclusive right to provide infrastructure services for a limited period, with the lowest bidder being awarded the contract (Spelthahn 1994: 69). From time to time the bidding procedure has to be repeated in order to renew the contract. Although this approach has been applied widely (e.g. in the French water sector) and further developed by a multitude of economists, it has also been heavily criticised by many others (Williamson 1976: 90). Among the arguments brought against this concept the possibility of collusion, the problem of sunk costs (and hence related competition restrictions) and the difficulty

of contractual implementation of future uncertainty have to be highlighted (Spelthahn 1994: 70).

Yardstick competition may be applied whenever there are two or more firms operating in a regulated sector. The basic idea is to compare economic performance of these firms with a benchmark which can either be the performance of the best performing firm or a weighed average of all of them (Spelthahn 1994: 68). This instrument reduces the problem of asymmetric information to some extent although there is a high incentive for collusive behaviour.

### 2.1.6.2.2 Regulation of Public and Club Goods

As elaborated in chapter 2.1.5.3 public goods require governmental regulation, since the characteristics of non-rivalry and non-excludability would result in free riders and consequent under supply if the market is left to the free interplay of market forces.

INTERNAL REGULATION	EXTERNAL REGULATION	COMPETITION FOR THE FIELD	
<ul> <li>Public Enterprise</li> </ul>	<ul> <li>Subsidization</li> </ul>	<ul> <li>Tendering</li> </ul>	

Table 5: Public and Club Good Regulation.

One option to tackle this market failure is to provide the good by the public sector, hence use an internal regulation approach, which will be applied mostly in the case of pure public goods where excludability is not possible in any way. A second option would be to let the private sector provide these goods by subsidizing them in order to provide an adequate quantity (external regulation). By far the most common approach, however, is to use competition for the field to ensure competitive and efficient solutions. This approach allows the government to ensure sufficient supply of the public good by subsidizing the winning bidder combined with the competitive selection of the most efficient firm.

In the case of club collective goods the fundamental question is, if potential users are able to organize themselves in clubs to produce the good against remuneration. In such case no further regulation is necessary, in the opposite case the government has to promote or even impose such club formation (Wolter 1997: 83). Furthermore there is the additional problem that consumers, due to the non-excludability within the club, tend to overuse the good, which can lead to mutual interference and rivalry to a certain extent (Strohbach 1999: 30).

#### 2.1.6.2.3 Regulation of Externalities

As elaborated in chapter 2.1.5.4 the outcome of competitive markets is unlikely to be Pareto efficient, if external effects are present, which puts pressure on the governments to provide corrective measures. In case the infrastructure is provided by public enterprises internal regulations may apply, in the case of private sector participation regulative measures are referred to as external.

INTERNAL REGULATION	EXTERNAL REGULATION
<ul> <li>Public Enterprise</li> </ul>	<ul> <li>Direct Regulation         <ul> <li>Standards, Laws</li> <li>Pigouvian Tax</li> </ul> </li> <li>Indirect Regulation         <ul> <li>Tradeable Certificates</li> </ul> </li> </ul>

Table 6: External Effects Regulation.

The traditional case of negative externalities is the pollution of the environment, where governments may either use direct or indirect external regulative instruments. Direct control refers either to laws and standards that directly shape the firm's behaviour within a certain framework (Baumol and Blinder 2004: 424), e.g. sewage discharge limits or standards for drinking water quality, or by imposition of a Pigouvian tax, i.e. a punitive tax imposed on the firm producing the negative external effect (Varian 2003: 614). Indirect measures are a recent approach to externality control. A fixed number of transferable pollution permits is issued, allowing these permits to be bought and sold freely in order to create a market from which the marginal cost of pollution can be derived (Mansfield and Yohe 2004: 682). A typical case of positive externalities are network effects where the infrastructure good is more valuable to a user the more users adopt the good. Objects of regulation are standardization, interoperability and compatibility in order to ensure the expansion of the size of a network (Bolt and Humphrey 2005: 7).
#### 2.1.6.3 Governmental Decision-Making

Although private sector participation has become widespread in many infrastructure markets, fundamental decisions are still subject to governmental decision-making and therefore the problem of public choice. Collective decision-making, compared to private decision-making, involves two central difficulties. First, individuals may not be prepared to specify their true preferences when they are asked in polls, since the answer will depend on whether they have to pay (understatement of preferences) or not (overstatement of preferences) for the good (Stiglitz 2000: 158). Second, there is the problem of aggregation, since different people have different preferences. The simplest way of resolving such differences is majority voting; unfortunately, however, there may not exist a majority voting equilibrium (Stiglitz 2000: 163), a scenario which is called the Condorcet-Paradox after 18<sup>th</sup> century French philosopher Marquis de Condorcet. This train of thoughts has been further developed by the US economist Kenneth Arrow who wrote in his article of 1950:

"If we exclude the possibility of interpersonal comparisons of utility, then the only methods of passing from individual tastes to social preferences which will be satisfactory and which will be defined for a wide range of sets of individual orderings are either imposed or dictatorial" (Arrow 1950: 342).

According to Arrow an ideal political mechanism would need to satisfy the characteristics of transitivity, nondictatorial choice, independence of irrelevant alternatives and unrestricted domain. He finally showed that no rule would satisfy all the required features, a theorem which is referred to as Arrow's impossibility theorem (Arrow 1950: 328). Hence a majority voting equilibrium may not exist and if it exists, in general it is not Pareto efficient (Stiglitz 2000: 177). The most famous alternative system to overcome this problem was developed by the Swedish economist Erik Lindahl in 1919 (Lindahl 1919).

A last problem associated with public choice economies is the influence special interest groups may have on the outcome of political processes. There has been an increasing recognition of the power of manipulation on governmental decision-making recently, but no attempt has been made so far to reduce this interference (Stiglitz 2000: 179).

# 2.2 Theory of Private Sector Participation

A rough analysis of contemporary literature shows clearly an increase of publications on privatization, private sector participation (PSP) and public-private partnerships (PPP) over the last three decades (Ioannidis 2004: 14). What nevertheless becomes additionally clear is that the notions of PSP and PPP are used in different ideological backgrounds with different definitions and a clear-cut generally accepted concept is not available so far (ibid: 29). Chapter 2.2 therefore aims at illustrating what PSP shall mean in the context of this study and shall provide an overview on different approaches of private sector participation in the water sector.

# 2.2.1 The Private Sector and the Public Sector

In a mixed economy, a status which in practice can be attributed to all modern economies, economic activities are undertaken both by private enterprises and by the government. Additionally the government tries to influence the behaviour of firms by means of regulation, subsidies and taxes (Stiglitz 2000: 4). According to most historians a purely laissez-faire economy has never existed, however, the degree of intervention varies considerably between different nations, but also markedly over time.

Advantages of the Public Sector	Disadvantages of the Public Sector
<ul> <li>Maximization of social welfare (unless no particular objectives of politicians or interest groups are followed).</li> </ul>	<ul><li>Lack of explicit objectives (too political)</li><li>Inappropriate incentives</li></ul>
<ul> <li>Fast reaction to unforeseeable incidences. Regulation is easier due to lower control and transaction costs.</li> </ul>	<ul> <li>No capital market control</li> <li>No insolvency risk (only soft budget restrictions, no hard budgets)</li> </ul>
<ul> <li>Easier coordination with the remainder of economic policy (can be a disadvantage if policy is too interventionist).</li> </ul>	<ul> <li>Risk of expropriation of investments</li> </ul>

Table 7: Pros & Cons of the Public Sector. Based on data from Furrer (2004: 46).

The public sector comprises the totality of national, regional and local governments and authorities together with the nationalized industries and public corporations. According to Stiglitz the public sector performs the following main roles: provision of a legal framework, regulation of economic activity, production and consumption of goods and services, redistribution of income and provision of social insurance (Stiglitz 2000: 50). Focus of its activities is not making profits but the public interest, social responsibility, solidarity and the protection of the environment (Rosenau 2000: 11).

The private sector is that part of the economy in which activity is carried out by private firms and households and includes the personal and the corporate sector. It is in general assumed that the private sector's only objective is the maximization of profit or the shareholder value (Furrer 2004: 49), which, however, is not necessarily true, since the process of goal setting is not unipersonal, but multipersonal and much more complex than assumed traditionally (Lechner et al. 2001: 67). An analysis of the principal differences of the public and the private sector is exhibited in Table 8. It has, however, been affirmed lately that the differences between public and private enterprises are far less significant than traditional analysis has assumed. Both are highly decentralized, small shareholders and citizens have a minimum of influence on daily business and the management has wide room for manoeuvre. In the (admittedly unrealistic) case of perfect markets and complete information public and private entities would barely be distinguishable (Furrer 2004: 48).

	Public Sector	Private Sector
Principle of Distribution	democracy, redistribution	price mechanism
Principals	citizens	shareholders
Goals	multidimensional	defined and unambiguous
Control	multidimensional	defined, profit oriented
Hierarchy Levels	many	few
Incentive Structure	weak	strong
Job Security	high	lower
Scope of Activity	geographically and legally restricted	entire market, only framework is fixed
Risk Position	risk aversion	risk affinity
Finance	mainly taxes	finally profits
Market Structure	monopoly	competition

Table 8: Differences between the Public and the Private Sector.Adapted from Osborne (2003: 205).

# 2.2.2 Privatization

Privatization debates are considered to be one of the core issues of economics and can be traced back even to Adam Smith's 'Wealth of Nations' (1776) where Smith refers to productivity and efficiency gains as arguments favouring privatization (Spelthahn 1994: 14). Today, consensus among economists can only be found regarding security issues such as police, military and jurisdiction where privatization is considered to be inappropriate, all other areas are seen as highly controversial (ibid).

In Europe many governments nationalized their core industries after the Second World War in order to promote growth and stability and lead the industries back to international success (Kastil 2006: 14). This is particularly true for France, Great Britain, Austria and Italy, whereas in Germany this trend turned out to be by far less strong (Spelthahn 1994: 15). It was not until the eighties of the 20<sup>th</sup> century that an international rethinking, led by the UK and USA, began and many state-owned companies were reprivatized (Kastil 2006: 12).

The terminology of PSP has become complicated in the last years, mainly for ideological reasons. After the positively perceived wave of privatizations in the 1980s, the general public became more sceptical and the term privatization was attached a negative aftertaste. New terms, such as private sector participation (as used by the Worldbank) and publicprivate partnership (to put emphasis on the cooperation aspect), were introduced and sometimes used identically to the word "privatization" (Hall et al. 2003: 2). This linguistically imprecise handling has made communication and common understanding more complex. This study will use the term 'private sector participation' equivalent to the word 'privatization', whereas 'public-private partnership' is used only in the narrower sense and considered to be a subordinate case with particular cooperative elements (Rudolph et al. 2005: 67).

# 2.2.2.1 Definition of Privatization

In a very broad sense privatization is defined as a process that modifies the relation of the public and the private sector regarding the performance of public obligations, public enterprises, public facilities and covering the own requirements of public bodies (Schaffhauser-Linzatti 2000: 25). The dynamic dimension refers to a decrease of services by the public sector, whereas the static dimension implies the transfer of property to private

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persons (ibid: 26). Literature usually distinguishes between formal, material-organizational and material-functional privatization (Furrer 2004: 42, Schaffhauser-Linzatti 2000: 28), although sometimes the varieties formal, functional and material privatization are used (Weber et al. 2006: 56). There is a definitive need for the standardization of these terms, since equal terms are occasionally used in totally different contexts (e.g. Wettstein 2004: 12), which hampers scientific discussion on a broader base.

#### 2.2.2.2 Formal Privatization

Formal privatization refers to a scenario where an institution or public enterprise organized and incorporated under public law is transformed into a legal entity organized under private law. There is no change in the ownership structure, 100% of the equity remains in public hands (Weber et al. 2006: 57). When public facilities are financed by private entities the term 'financial privatization' is applied. Formal privatization is a precursor to functional or material privatization, although sometimes governments also tend to use formal privatization for the efficiency gains associated with private organization forms. Empirical evidence for this assumption, however, is weak (ibid: 58).

#### 2.2.2.3 Material Privatization

Material privatization calls for direct transfer of production to the private sector and includes material-functional and material-organizational privatization. This can be accomplished by direct divesture, reduced provision of capital or outsourcing of particular functions (Schaffhauser-Linzatti 2000: 29). In the context of organizational privatization the provision of the service is transferred to the private sector, but responsibility for the implementation remains with the public sector. A typical example in the water sector is the French franchising model (Furrer 2004: 43). A more recent term associated with such transactions is 'outsourcing' (Weber et al. 2000: 59). Ownership of the public utility remains with the state, only the service is provided by the private sector. Furthermore such privatizations are in principle limited in time.

The most consequent form is material-functional privatization where public duties and responsibilities are completely and permanently transferred to the private sector. This approach implies a complete delegation to the private sector; whether the service is provided, now depends only on the private enterprise. A case in point is the English water sector, where ownership of the water companies has been transferred to the private sector (Furrer 2004: 43).

# 2.2.3 Theories of Privatization

The question whether there is substantial economic or political rationale for privatization from a theoretical point of view has occupied (and is still occupying) the scientific community intensively. The following paragraphs therefore aim at providing an overview of the most relevant theories brought forward in support of private sector participation.

Under *agency theory* the delivery of services of an organization is seen as a series of contractual relationships. The basic assumption is that the owners of an organization are not the managers, which means that ownership is separated from control and that the owners (principals) enter into contracts with the managers (agents) to deliver said services (Hodge 2000: 38). However, interests of principal and agent may diverge, i.e. the so-called principal-agent-problem, which calls for control mechanisms for the principal, since the agent, due to asymmetric and incomplete information, may take an advantage of the situation (Furrer 2004: 49). Agency theory was first developed by Jensen and Meckling in a 1976 publication (Jensen and Meckling 1976: 305) and has afterwards spread rapidly into different fields of modern economics. In the public sector the principal is much more complex and includes the respective ministers and the government, but superordinate also the taxpayer and the electorate. According to agency theory the private sector is more efficient since the capital market strengthens the incentive structures for the agent to behave in line with the principal's requirements due to the following reasons which do not exist for the public sector (Alexander and Mayer 1997: 1): the threat of bankruptcy, internal controls (monitoring) imposed by the shareholders and external controls such as the threat of a hostile takeover.

Transaction cost theory was first proposed by Coase (Coase 1937) and consequently further developed by Williamson (Williamson 1989). The central elements of this concept are contractual transactions and the cost of procuring, entering into, monitoring and changing the involved contracts (Furrer 2004: 58). Transactions may be organized in the spot market, via long-term contracts or by means of vertical integration. Which governance structure is applied, depends (based on the assumptions of limited rationality and opportunism) on the three dimensions "asset specificity", "uncertainty" and "frequency" (Williamson 1989: 13). According to Crocker and Masten "the choice between market and regulatory governance of public utility transactions has direct parallels to the theory of the firm. In each case, the hazards of renegotiation in the presence of relationship-specific investments at the time of contract renewal makes (sic!) anonymous spot markets unattractive" (Crocker and Masten 1996: 13). If environments are certain and not complex, transaction costs can be lowered by entering into long-term contracts by franchise bidding (ibid).

*Property rights theory* has its roots in the works of Alchian (1965) and Demsetz (1969) and "explains differences in organizational behavior solely on the basis of the individual incentive created by the structure of property rights" (Starr 1989: 28). The right of property comprises the right to use (usus), the right of usufruct (usufructus), the right to change form, location or substance (abusus) and the right to dispose of an asset (ius abutendi) (ibid). The main focus of this theory is on the incentive for performance improvement (Hodge 2000: 42) and argues that allocative and productive inefficiencies in the public sector have mainly to be attributed to the diverge of property rights and rights of disposal (Spelthahn 1994: 31). Highest possible efficiency is associated with a scenario where the owner of an asset has all the attached property rights for the asset, since the benefits of efficient performance accrue directly to himself. In public enterprises the story is different since the owners, which are the taxpayers, have no property rights (or only collectively), whereas the managers have little incentive for efficient performance (ibid).

The fundamentals of *public choice theory* have already been elaborated in chapter 2.1.6.3. It should, however, be added that this theory has had enormous impact on public administration practices and reforms over the last decades (Hodge 2000: 36). The theory argues that individuals are rational egoists and that they "can express their personal preferences much more efficiently through market exchanges than via political participation" (ibid). Public choice concepts have been exceedingly influential in providing ideological frameworks to legitimize and underpin political reforms towards reduction of the role of the state and privatization of service delivery, wherever possible (ibid).

Managerialism and new public management are management philosophies developed throughout the 1980s and aimed at modernizing and improving the public administration. At the core of the notion of managerialism is the excessive introduction of managerial techniques into traditional government departments and the public administration. It is a set of beliefs, attitudes and values which support the view that management is the most essential and desirable element of good administration and government. By incorporating public choice theory and institutional economic concepts, the theory was finally further developed to the doctrine of new public management (NPM), which goes far beyond the notion of managerialism. Key words associated with NPM are project management, flat hierarchies, lean management, total quality management, quantified performance targets and similar issues (Hodge 2000: 40). An additional core element is the emphasis on and preference for private ownership and hence the support for private sector participation (ibid).

Besides the theories described above there is also the plausible idea that in fact there is no economic rationale supporting private sector participation (the *historic or contingency theory*), but it is simply a political mechanism to achieve non-economic goals. One could say that "privatization is the direct result of combinations of both ideological and pragmatic contingencies within a fluctuating political and ideological environment of history throughout this century" (Hodge 2000: 44). Possible non-economic (hence political) goals include, among many others, debt reduction, freedom from political interference, reduced trade union power, consumer benefits, placating external financing bodies or the reduction of corruption (ibid).

# 2.2.4 Privatization, Liberalisation and Deregulation

Public discussion on the topic of private sector participation has demonstrated a strong tendency to confuse and mix the terms privatization, liberalization and deregulation. It seems therefore necessary to briefly define the concepts of liberalization and deregulation, as opposed to privatization as described in chapter 2.2.2.

*Liberalization* refers to the maximum possible reduction of state interference in economic markets and hence the promotion of competitive mechanisms. The concept of economic liberalism was developed in the Enlightenment, but suffered a dramatic decline during the late 19<sup>th</sup> and early 20<sup>th</sup> century and has been booming again since the 1970s. Although normally associated with privatization, the concepts are independent, as can be seen in the European electricity and gas markets. The E.U. abolished area monopolies and introduced competition, i.e. liberalized the markets (Rudolph et al. 2005 68). Nevertheless some of the big market players (e.g. French EDF) remain partly or even completely in public ownership.

*Deregulation* refers to the process of reducing the burden of government control and restrictions on a much broader level. The economic rationale behind this process is to relieve enterprises (both public and private) from bureaucratic barriers with the aim to improve efficiency (ibid). Liberalized markets may well be regulated; health and safety norms or environmental standards are a case in point. It should also be clear that privatization is totally different from deregulation, since regulation is applied both to public and private enterprises and many privatized companies are subject to heavier regulation than their public counterparts. It should be evident that a 100% deregulation is neither possible nor desirable due to the necessity of a basic legal framework.

# 2.2.5 Models of Private Sector Participation

## 2.2.5.1 Overview and Classification Parameters

When taking a look on recent literature on private sector participation there is one thing that becomes clear immediately: the number of models developed, both in the European context and in the field of development economics, is legion, but unfortunately also definitions and applied vocabulary may vary according to the ideological or academic background of the author. Chapter 2.2.5 therefore puts a premium on the presentation of the various PSP models that emerged over the last few decades.





Among the parameters most frequently cited to characterize the miscellaneous concepts one can find ownership of assets, risk allocation, operative responsibilities of the private sector, contract term and finance (Worldbank 2006b: 9, Furrer 2004: 81, Schenner 2006: 22 or Weber et al. 2006: 57). Figure 10 provides a general view on PSP models subject to the

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contract term and the extent of the operative responsibility of the private partner. The scheme is divided into three subsections depending on the financing and investment obligations of the private sector. Broadly it can be presumed that the share of the private sector increases from the left to the right, while municipal risk decreases from the bottom to the top.

### 2.2.5.2 Consulting and Technical Assistance

Pure consulting contracts refer to the provision of intellectual services based on professional qualifications and experiences and are rendered without any interest for further deliveries or provision of services (Rudolph et al. 2005: 71). Since the consultant has no right of instruction towards the employer, generally no performance guarantee is attached to this service (ibid). Fields of application are feasibility studies, preparation and monitoring of tenders and the controlling of project executions.

# 2.2.5.3 Service Contract

By means of service contracts, private companies render isolated services for the public utility, in general against payment of a lump sum price. Contract terms typically range from one to five years and do not touch the core business of the utility. Activities which may be contracted out are for example the installation and reading of water meters, invoicing, cleaning services for the administration buildings, etc. (Furrer 2004: 180). The associated advantage is that for specific tasks efficient private experience can be contracted in a flexible way. To ensure best possible performance always in-house bids should be included in the evaluation (OECD 1997: 4). Additionally, service contracts are sometimes entered into due to personnel shortages in the public utility (Furrer 2004: 182). Since the management of the utility and the responsibility of investment remains with the public sector, quality can be controlled directly by the state.

### 2.2.5.4 Management Contract

By means of management contracts the responsibility of managing a public utility is transferred to a private operator, typically for a contract term of 3-5 years (Worldbank 2006b: 7). This increases the management autonomy and reduces the threat of political interference (Furrer 2004:

184). Remuneration can be a fixed fee for performing the managerial tasks or may involve complex incentive schemes based on performance targets. The challenge hereby is to choose measurable targets and align them with the bonus scheme of the managers (Worldbank 2006b: 7).

# 2.2.5.5 Operation and Maintenance

Under an operation and maintenance contract (O&M contract) responsibilities of the management go even further. Against the payment of a lump sum fee the private partner takes over the complete operation of the utility, including personnel responsibilities and obligations concerning the maintenance of the plant. The fundamental advantage for the public utility compared with management contracts is that the private sector assumes all related operation risks and performance guarantees. Ownership of the assets remains with the public sector (Furrer 2004: 184).

# 2.2.5.6 Design, Build and Operate

The DBO-model (Design Build and Operate) combines the turnkey construction of an infrastructure with an attached operation and maintenance contract for a period of up to above thirty years. After construction the plant is taken over by the contracting authority, hence the plant is owned by the public sector during the O&M period.

### 2.2.5.7 Affermage and Leasing

Lease contracts (or the French variety affermage) refer to an arrangement where the private operator rents a utility from the public sector for a fixed fee and ownership is retained by the public authority. The difference between the lease and affermage is purely technical: under a lease contract, revenues collected from the clients are retained by the private operator and a lease payment is made to the contracting authority, which the authority can use for investment. Using an affermage, the contracting authority and the operator share the revenues and the operator pays the contracting authority an affermage fee, depending on the demand and customer tariffs, and retains the remaining revenue. Since the operator's profit under both arrangements varies with the utility's sales and costs, there is a strong incentive to improve operating efficiency and increase sales (Worldbank 2006b: 10). The responsibility for planning, finance and investment remains with the public authority, but has to be coordinated with the operator, who operates and maintains the plant (Furrer 2004: 184). The commercial risk is borne by both parties, since revenues are directly related with customer tariffs (ibid).

### 2.2.5.8 Cooperation Model

Cooperation models refer to public-private partnerships (in the narrower sense) where the basic idea is that the public sector and a private company are both shareholders of a special purpose company, responsible for the provision of the infrastructure service. The two possible ways for the formation of such a joint venture are, first, the tendering of a BOO contract under the condition that the public sector takes a (mostly majority) share in the special purpose entity or, second, that shares of an existing public company are partly divested to the private sector (Weber et al. 2005: 87).

The leading thought of this concept is to align the interests of the private and the public sector by making them both shareholders of the same company and to set out in writing these principles of cooperation in a shareholders agreement (Stember 2005: 42). The advantage generally associated with this form of private sector participation is that each partner brings in specific know-how and the risks are allocated accordingly. The public partner mostly retains a majority stake in the company in order to maintain the necessary political influence in the provision of the infrastructure (Rudolph et al. 2005: 72).

By limiting private investor control it can be politically easier to agree on the private participation in infrastructure provision, additionally joint ownership demonstrates the commitment of the public sector towards the venture (Worldbank 2006b: 11). Although most special purpose entities are incorporated in the form of public or private limited companies there have also been some attempts to use limited or unlimited partnerships as legal forms (GWI 2006a: 16).

#### 2.2.5.9 BOX Models

In the international context a broad range of models has been developed under the collective term BOX, applying the abbreviations D (Design), B (Build), F (Finance), O (Operate), O (Own) and T (Transfer) to describe the scope of the particular models (Rudolph et al. 2005: 72). The most popular ones among them are however the BOT (Build Operate Transfer) and the BOO (Build Own Operate) approaches, where the focus is on the construction and on the finance of new infrastructures (Strohbach 2001: 70). Under BOT the public sector tenders planning, construction, finance and operation and maintenance of a water treatment facility to a private special purpose company which after the expiration of the contract term (typically between 10 and 30 years) transfers it to the public sector. If, by contrast, a BOO is implemented, the facility remains in the private sector. The contractor is normally remunerated performance-related, that means e.g. per m<sup>3</sup> provided potable water or per m<sup>3</sup> treated sewage water. Depending on the concrete contractual arrangement either the SPC directly charges and invoices the users or the public sector remunerates the private company based on its performance (Furrer 2004: 183).

Finance is provided in the form of project finance, based on the expected cash flows of the project and without (or limited) recourse to the sponsors (Weber et al. 2006: 15) and is one of the advantages of BOT or BOO models. The public sector budget is disencumbered, although in exchange for higher cost of the infrastructure due to higher private sector capital cost (Strohbach 2001: 54). Additionally, efficiency gains are assumed due to the holistic service character of the concept, transferring the entire responsibility and risk to the private sector, which means that under tender conditions the economic optimum can be reached (Rudolph et al. 2005: 72). A typical example for BOTs is the current hype for IWPPs (Independent Water and Power Plants) in the Middle East (Saul 2004: 24).

#### 2.2.5.10 Concession

If a private company is assigned the right and obligation of the complete infrastructure provision within a certain geographical area and the cost therefore is directly charged to the users by means of fees the term

concession is applied (Rudolph et al. 2005. 73). Contrary to BOX schemes the right of use for the existing infrastructure is transferred to the concessionaire for an agreed contract period, with the public authority retaining ownership of the assets. Assets constructed by the operator under the contract also revert to the public sector when the arrangement ends (Worldbank 2006b: 10). The concessionaire therefore carries also the market risk, as his investment is paid for by user fees, although the public sector sometimes cushions this risk by paying the private partner directly a fixed periodic base fee. In principle all non-sovereign functions such as planning, design, construction, O&M, finance among others are transferred to the operator, the state remains only with the obligation of sectoral long-term planning (Hirschhausen 2001: 8). The economic rationale for the efficiency gains of concessions is to introduce competition for the market as elaborated on in chapter 2.1.6.2.1 and has found wide application, first, in the French water sector and consequently all over the rest of the world due to the global dominance of the French water companies Veolia (formerly Vivendi) and Suez. However, substantial criticism has arisen recently questioning the efficiency associated with this model (Lobina 2005: 55).

#### 2.2.5.11 Divesture

Divesture refers to the complete and unlimited transfer of the ownership of infrastructure from the public to the private sector and constitutes the most comprehensive form of private sector participation. The operator assumes the totality of risks and tasks associated with the provision of the infrastructure service and also the legal ownership of all assets is transferred. In the water sector up to now only England and Wales (and regionally also some Latin American cities) have adopted this scheme (Rudolph et al. 2005: 73). Due to the natural monopoly character of parts of the water sector, full divesture requires the market to be regulated as described in chapter 2.1.6.2.1. A case in point is the English price cap regulation adopted after the 1989 privatization (Furrer 2004: 149).

# 2.2.5.12 Resume and Comparison

The following Table 9 aims at providing an overview on the various characteristics of the presented PSP models. Most of the models have been applied both to European and international contexts with varying success. However, particularly in developing countries the models in many cases did not demonstrate the benefits they theoretically should have.

	Ownership of assets	Contract Term	Planning	Finance & Investment	Construction	M&O	External monopoly regulation required
Consulting	Public Sector	0-2 years	Both Sectors	Public Sector	Private Sector	Public Sector	no
Service Contract	Public Sector	0,5-5 years	Public Sector	Public Sector	Private Sector	Public Sector	no
Management	Public	1-10	Private	Public	Private	Public	no
Contract	Sector	years	Sector	Sector	Sector	Sector	
O&M Contract	Public Sector	3-25 years	Private Sector	Public Sector	Private Sector	Private Sector	no
DBO	Public Sector	1-30 years	Private Sector	Public Sector	Private Sector	Private Sector	no
Affermage	Public	7-25	Private	Public	Private	Private	yes
	Sector	years	Sector	Sector	Sector	Sector	(tender)
Leasing	Public	10-30	Private	Public	Private	Private	yes
	Sector	years	Sector	Sector	Sector	Sector	(tender)
Cooperation Model	Both Sectors	10-30 years	Both Sectors	Both Sectors	Private Sector	Private or Both Sectors	no
воо	Private	10-35	Private	Private	Private	Private	yes
	Sector	years	Sector	Sector	Sector	Sector	(tender)
вот	Private	10-35	Private	Private	Private	Private	yes
	Sector	years	Sector	Sector	Sector	Sector	(tender)
Concession	Public	15-50	Private	Private	Private	Private	yes
	Sector	years	Sector	Sector	Sector	Sector	(tender)
Divesture	Private	25-∞	Private	Private	Private	Private	yes
	Sector	years	Sector	Sector	Sector	Sector	(price)

Table 9: Comparison of PSP Models.

# 2.3 Theory of Economic Development

The availability of water, as the primary life-giving resource, is a fundamental component of socio-economic development and plays a major role in poverty reduction and alleviation (UNESCO 2006: 6). Although human society has mainly settled in areas with sustainable water supplies, a defining characteristic of today's world is that fourty percent of the global population are exposed to extreme poverty where the provision of water and sewage services is not guaranteed. Owing to the particular context of developing economies most of the models applied to European economies have failed in poorer countries which triggered a search for new ways to solve the problem.

The study of economic development as an academic subject is of post Second World War origin, when international bodies such as the Worldbank and the United Nations began to provoke political and public concern with the poorer nations of the world (Thirlwall 2006: 3). Development economics in addition to the conventional economics of efficient resource allocation and steady growth over time "must also deal with the economic, social, political and institutional mechanisms, both public and private, necessary to bring about rapid [...] large-scale improvements in the levels of living" (Todaro 2000: 8).

#### 2.3.1 Development and Underdevelopment

A prerequisite of the analysis of developing economies is the central question of what we mean by development and what by underdevelopment. In traditional definitions (prior to the 1970s) development was nearly always seen as a strictly economic phenomenon, with the main focus of a country's capacity to generate and sustain an annual increase in its gross national product (gnp). The experiences from these early attempts of development policies, however, led to a redefinition of the concept and evolved to the modern approach applied to development.

<sup>&</sup>quot;Development must [...] be conceived of as a multidimensional process involving major changes in social structures, popular attitudes, and national institutions, as well as the acceleration of economic growth, the reduction of inequality, and the eradication of poverty" (ibid: 16).

According to the American economist Michael P. Todaro, development is both a physical reality and a state of mind. By combining social, economic and institutional processes, a society secures the means for obtaining a better life and follows three objectives: the increase of availability of basic life-sustaining goods (*life-sustenance*), to raise the levels of living (*selfesteem*) and to extend the range of social and economic choices (*freedom*) (Thirlwall 2006: 17, Todaro 2000: 18).

Among the most important theories of development five strands of thought are salient. Post-war economists viewed the process of development as a series of successive stages through which all countries have to pass. Rostow's stages of growth theory and the Harrod-Domar growth model are a case in point. This notion was largely replaced throughout the 1970s by two competing schools of thought. The first concept focused on the patterns of structural change a developing country had to undergo in order to create sustained growth (e.g. the Lewis theory of development). The second school, the international dependence revolution, was much more radical in its orientation and put a premium on social and institutional constraints on economic development (e.g. the neo-colonial dependence model, the dualistic development thesis or the false-paradigm model). In the course of the 1980s a new theory emerged which became known as the neoclassical (or neoliberal) counterrevolution, whose intention was to highlight the importance of free market, open economies and the privatization of inefficient public sector companies. Further development of this concept during the 1990s finally led to the fifth and current approach to development theory which is the new growth theory (or endogenous growth theory) (Todaro 2000: 78, Thirlwall 2006: 122, Jomo and Fine 2006: 68, Agénor and Montiel 1996: 667).

# 2.3.2 Measurement of Development

Although the evolution of the concept of development as described above was in many cases useful for the improvement of policy-making, it made operationalisation of the multidimensional concept and hence the measurement of development more challenging. The World Bank, however, continues to classify countries on the basis of *gross national* 

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product per capita (also referred to as per capita income (PCY)) into three broad categories, i.e. low-income countries, middle-income countries and high-income countries. A more useful (but still purely economic) measure, which aims at meaningful international comparisons of living standards is the *purchasing-power parity (PPP) gross national income per capita*, which takes into account real exchange rates between countries. Inequality measures to measure the inequality between nations (international inequality) or taking into account also inequality within countries (global inequality) include the *Lorenz curve* and the *Gini ratio* (Thirlwall 2006: 30).



Figure 11: Human Development Index (HDI) Map. Source: Gruhu (2007).

To overcome the limitations of the purely economic orientation of the PCY as an index of development and to meet the request for broader based measures the United Nations Development Program (UNDP) has developed two alternative indices for the measurement of development. The *Human Development Index* (HDI) is a three-dimensional classification ratio, comprising the variables life expectancy at birth, educational attainment and the standard of living measured by real PCY at PPP. The index has a range from 0 to 1, with 1 being the highest possible development (ibid: 47). The *Human Poverty Index* (HPI) also accounts for three variables (i.e. the percentage of population not expected to survive the age of 40, the adult illiteracy rate and a deprivation index) and gives also a range from 0 to 1, with 1 indicating highest poverty (ibid: 54). Sixty years of development economics have created a host of classifications and typologies of countries. Some of the terms today are considered inappropriate and politically incorrect but others are still in usage, although not implying exact definitions and being used in different contexts in different ways. Cases in point are *third world, developing countries, underdeveloped countries, backward countries, undeveloped countries, least developed countries, backward countries, north-south, east-west, newly industrialising countries, emerging markets, failed states and many more. For the purpose of correctness this study will try not to use this multitude of terms but focus on the HDI as a measure of development. Countries with an HDI of larger than 0,8 are considered to have high development although this includes also some economies in Latin America, Asia and Eastern Europe traditionally denominated developing countries.* 

In the context of this thesis developing countries will be defined as countries having an HDI of smaller than 0,8. The focus will nevertheless be laid on the segment of 0,5 – 0,8, representing the medium human development category. Peru which will be the country selected as the case study has an HDI of 0,767 and is ranked number 82 (UNDP 2006: 284).

## 2.3.3 Common Characteristics of Developing Economies

Although one should not try to generalise and stick to the conclusion that all developing economies show similar characteristics, it is, however, true that there are several features, which many economies have in common and which considerably contribute to the problems of those countries.

Among the characteristics most frequently referred to in literature are the following: dominance of agriculture and petty services, low level of capital accumulation, rapid population growth, exports dominated by primary commodities and natural resources, weak institutional structures, high rates of unemployment and underemployment, inadequate education, vertical and horizontal inequality, low levels of living, low incomes, poor health and health care systems, nutrition problems, low levels of productivity, prevalence of imperfect markets and limited information, dominance, dependence and vulnerability in international relations and many more (Todaro 2000: 42, Thirlwall 2006: 65)

# 2.4 The Concept of Franchising

When after World War II the international community issued its first programs to improve the water infrastructure in developing countries, the donor organisations put their focus on funding investments, leaving the later O&M of the facilities to local enterprises. Due to the characteristics of many of these societies (lack of education, trained staff etc.), however, it soon became clear that the bottleneck of efficient and sustainable water management was operation and maintenance of the water infrastructure. As a consequence the donors started to tender for both construction and operation of the infrastructures which led to the host of models described in chapter 2.2.5 and provided the necessary O&M stability for the plants.

Today, however, donors and water companies encounter a situation where only selected segments of the water market are accessible via conventional PSP models and even when the project profile allows the integration of a private company there is increasing public resistance against private water services. A promising innovative approach to cope with these limitations might be the franchising concept (Van Ginneken et al. 2004: 1, Rudolph and Harbach 2006:2).



# 2.4.1 The Inhomogeneity of the Water Market

Figure 12: Inhomogeneity of the Water Market. Source: Van Ginneken et al. 2004: 2.

In order to fully understand the possible applications of the franchising concept in the water sector an additional feature of the water

market has to be analysed, i.e. its inhomogeneity. Inhomogeneity occurs along two main dimensions, i.e. first, size of the population centre and second, market risk (Figure 12).

Based on population, size the water market can be divided into segments ranging from mega-cities to small rural villages, each with specific management particularities. The market risk is a subjective measure allowing for components such as gdp per capita, political and economic stability and exchange rate stability. The revenue-base of a private operator is contingent upon the population size; an increase in market risk raises the challenge for the investor. As a consequence global expansion of water PSP has to date taken place exclusively in the low risk/large city segment of the continuum (Van Ginneken et al. 2004: 2). The challenge for coping with the millennium development goals will therefore be to find innovative concepts to penetrate the remaining market segments and bring know-how and expertise to the secondary cities and small villages. These are typically at a disadvantage for the fact to be large enough to require sophisticated management systems but to too small to develop own sources of expertise.

# 2.4.2 Public Resistance against Private Water

Even for low risk/large population project profiles, PSP has become increasingly problematic, since the general public has shown considerable resistance against the provision of water services by private companies. The rather philosophical question whether water is a human right or a good to be allocated by market forces has evolved to be the core topic of mainly NGO's discourse, although this question has in principle nothing to do with the decision between having the service to operate the water infrastructure to be provided by a public or private entity. Besides that there is however the highly controversial and politically important issue of tariff increases. Lots of customers were used to very low and heavily subsidised tariffs prior to the privatisation process, but also extremely poor service quality. In many cases then the privatization resulted in dramatic price hikes, on the one hand for ill-advised contractual arrangements, but also because the public authorities found the implementation of the PSP to be an excellent moment to stop subsidising the water supply. Whatever have been the reasons, the result at least was that public resistance has made PSP in developing countries very difficult if not impossible (Rudolph and Bardach 2006: 3).

# 2.4.3 The Franchising Mechanism

*Business Format Franchising* is an entrepreneurial concept, prominently found in the fast food industry (e.g. McDonalds), in the car rental business (e.g. Hertz), but also in the hotel industry and in many other fields.

"Franchising is a vertical distribution arrangement where one independent contractor (the franchisor) grants another independent contractor further down the distribution channel (the franchisee) certain rights in return for a franchising fee and the latter's commitment to fulfil certain duties" (Obenaus and Weidacher 1990: 194).

The main difference between franchising and licensing is that franchising provides a complete and comprehensive business format including the transfer of business know-how, practices and expertise (accompanied by extended training schemes) and the right to use the franchisor's trade marks, logos and patent rights over a contractually defined period of time and within a specific geographic territory. Licensing on the other hand normally allows only for the granting of a specific right from the licensor to the licensee (ibid).

Payment in general takes place as a combination of an initial upfront fee and periodic royalty fees, based on the franchisee's gross sales. The main advantage for the franchisee is to be in the position to set up an own business as an independent business man, but with the support of an experienced entrepreneur and based on a proven business concept (which basically means less risk, less time and less investment). For the franchisor business expansion is the predominant driver. Franchising allows to enter new markets without the need for extended capital investment (such as in the case of establishing own subsidiaries) and with reduced risk exposure to unknown market conditions, which the local franchisee is much better able to manage. In order to maintain control of the franchisees activities, franchisors normally keep their contractual partners at a short leash and impose strict monitoring, reporting and controlling mechanisms. Some

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authors have therefore even referred to the concept of franchising as a modern from of slavery (Van Ginneken et al. 2004: 5, Obenaus and Weidacher 1990: 194, Wall 2005: 16).

	Franchisor	Franchisee
Advantages	<ul> <li>Business Expansion into New Markets</li> <li>Low Capital Expenditure</li> <li>Risk Diversification</li> <li>Exploitation and Integration of Local Market Know-how</li> </ul>	<ul> <li>Fast Business Start-up</li> <li>Proven Business Concept</li> <li>No Development and Low Marketing Cost</li> <li>Provision of Extended Training</li> <li>Exclusive Rights within Territory</li> </ul>
Disadvantages	<ul> <li>High Cost of Controlling, Monitoring and Reporting</li> <li>Risk of Brand Damage</li> <li>Education of Potential Future Competitors</li> <li>Lower Market Proximity</li> <li>Transfer of Core Business Know- How Necessary</li> </ul>	<ul> <li>Low Control over Business</li> <li>High Cost of Reporting</li> <li>High Royalty Fees based on Gross Sales not on Profit</li> <li>High Dependence on Image of Franchisor and other Franchisees</li> </ul>

Table 10: Principal Advantages and Disadvantages of Franchising.

# 2.4.4 Application to the Water Market

Applied to the water market franchising would mean the provision of technical know-how regarding the operation of a water utility from one operator (the franchisor) to other operators (the franchisees). The contractual arrangement could embrace specific packages adapted to the particular circumstances, including all areas of professional expertise necessary to run a utility (e.g. asset management, billing and collection, engineering, construction, operation & maintenance, human resources management and procurement). Typical types of service to be provided would be the use of the franchisors trademark, training programs, the rental of systems (accounting systems, customer's databases and asset management systems), continuous specialist assistance, centralized functions (e.g. procurement for certain goods) and the introduction to possible sources of financing (Van Ginneken et al. 2004: 7).

Potential franchisor candidates would be public, private or nonprofit entities (both local and international operators) with relevant experience in the water supply and sanitation sector and an extended track record of utility operations. On the other side potential franchisees would include local public and private companies and community groups that already operate water utilities, but also new entities which are willing to enter the market via franchising contracts (contractors, small scale providers and non-profit organizations) (ibid: 8). Particular attention has been paid to the investigation of small-scale private service providers (SPSPs) and their role in the provision of water services (Kariuki and Schwartz 2005: 1)



Figure 13: Franchising in the Water Sector. Source: Van Ginneken et al. (2004: 7).

The economic rationale for this concept is based on its superiority in two specific situations. On the one hand it enables the penetration of market segments previously not accessible for water companies. Due to the flexibility of the model in both the involved actors and the content of the franchising package it extends the accessible market towards smaller populations and medium to high risk segments. On the other hand, it could lower public resistance towards private water provision, since the public gets only in touch with the local service provider and not with an anonymous international water giant (Van Ginneken et al. 2004: 10, Rudolph and Harbach 2006: 7) Although intensive research on the theoretical aspects of the concept has been done, so far there are no reported experiences out of already implemented projects. Currently the first pilot project is being implemented by the German Institute for Environmental Engineering & Management and Biwater in South Africa.

# **3 THE EUROPEAN WATER SECTOR**

The first two research questions of this thesis refer to the long-term experiences of the European water supply and sanitation markets and the possible lessons learnt out of those approaches. The hypothesis is that said experiences can be applied to the design of innovative concepts to contribute to water solutions for developing countries. In a first step chapter 3 will therefore provide a literature review on the water sectors of selected European countries, namely the U.K., France, Germany, Spain, Italy, the Netherlands and Austria. Consequently chapter 4 will resort to decision-makers both in public and private entities in order to empirically survey the experiences made directly by the stakeholders of the water sector. The rationale for the hypothesis is based on the fact that the origin of the modern forms of water supply and sanitation has to be attributed to 19th century Europe. Hence, the European continent is in the position to look back on almost two centuries of intensive experience with different models of water sector organisation. This track record should give immense insight into the functionality of the water sector and enable future decision-makers to build upon the lessons learnt.



Figure 14: Map of Main European River Basins. Source: UNEP (2002: 77).

# 3.1 England & Wales

When in 1989 the U.K. privatized the water utilities of England and Wales it was the first time in history that a country transferred its complete water market to the private sector by means of divesture. This event brought about intensive worldwide repercussion both in news media and in academic journals and was subject to a wide range of analysis concerning various aspects of the transaction. Consequently the English model was partially applied to areas in the U.S. and in Chile.

### 3.1.1 Historical Context

Water provision in the form of an industrial sector can be traced back to the sixteenth century in the United Kingdom, when demographic and economic development began to require a more organized approach to the provision of water services (Hassan 1985: 532). It was, however, not until 1698 that the first private water company was founded by the engineer William Yarnold for the water supply in Newcastle upon Tyne.



Figure 15: Number of Waterworks Incorporated by Statute in England, Scotland and Wales, 1711-1860. Based on data from Hassan (1985: 534).

In the eighteenth and nineteenth centuries the trend towards the establishment of so called water statutory companies in the form of jointstock companies continued and by 1851 around 55% of urban water supply was provided by the private sector (Spelthahn 1994: 160). The situation non the less changed due to the decreasing quality of the English water resources and in the wake of two dramatic cholera epidemics in 1831/32 and 1848 with death tolls of 20.000 and 72.180, respectively, resulting in the Public Health Acts of 1848 and 1875 and an increasing influence of the public sector in the water supply market (ibid: 161). The British experiment with laissez-faire in the water industry was recognized as a failure and the late 19<sup>th</sup> century saw a heavy municipalization of water services and the private bastion was finally brought to an end by the creation of the Metropolitan Water Board in 1903 (Hassan 1985: 534).

In the 1920s and 1930s a trend towards stronger de-regionalization and nationalization became dominant and this tendency of consolidation continued strongly after the Second World War. The Water Act of 1973 finally centralized the remaining water companies into ten (still publicly owned) water authorities, whose geographical borders were based on the integrated river basin management concept. Those authorities where not only assigned the obligations of water supply and sewage collection, but also all associated regulative and environmental control functions (a situation sometimes referred to as the integration of "poacher" and "gamekeeper"). Besides the authorities, 29 private statutory water companies continued to exist and provided (under heavy regulation) around 25% of English drinking water (Saal and Parker 2001: 65).

After the return of the conservatives to the government in 1979 and increasing efficiency and finance problems in the water sector, the water authorities themselves triggered privatization discussions in the mid 1980s. The Thatcher administration, as one of the leaders of a burgeoning worldwide trend, had already started to dismantle public influence in many industries and there was sufficient political consensus for privatization in the U.K. of that time (Burton 1987: 21). It was assumed that private companies would enhance efficient operations and furthermore attract private capital needed for investment to meet higher quality standards that had been introduced by the European Union. First, competences were therefore transferred from a municipal to a national level by means of the Water Act 1983 and in 1986 the government published a White Paper to make public its ideas of the imminent privatization. In 1989, finally, England and Wales carried out one of the first modern water sector privatizations, by transferring environmental regulatory responsibilities to the *National Rivers Authority* (to resolve the poacher-gamekeeper-problem) and setting up an economic regulatory agency, the *Director General* with his *Office of Water Services*. The Water Authorities were converted into private *Water Service Companies* and sold on the stock exchange and for the still existing 29 statutory water companies a regulatory framework was fixed. All water companies became subject to price cap regulation as illustrated in chapter 2.1.6.2.1 (Van den Berg 1997: 1, Furrer 1994: 147, Spelthahn 1994: 164).

Privatization was accomplished in the form of complete divesture on the London Stock Exchange; the government transferred all assets and associated ownership rights to the private sector. In order to ensure a smooth privatization process, the British government subsidized the process with 1,57 billion GBP (the so called 'green dowry') and furthermore enabled the immediate write-off of almost 90% of the industry's 5,5 billion GBP debt. Additionally, a publicity campaign was launched to accompany the sale (Spelthahn 1994: 174). Particularly media coverage was provoked by the buying spree of the French water groups Suez, Veolia (at that time Vivendi) and SAUR, which acquired huge stakes in the statutory water companies. This move was seen as a market entry to be continued at a much broader level and triggered discussions on a government golden share in the water companies. Finally, it was concluded that within the first five years after privatization no shareholder could hold a stake larger than 15% (ibid: 173).

The 1990s and the beginning of the new millennium saw some minor changes in the legislation associated with the water sector, but in principle the framework established in the Water Act 1989 is still in place. In the Water Industry Act 1991 the duties of the *Director General* were set out and by means of the Competition and Service (Utilities) Act 1992 inset appointments were introduced to further promote competition in the water sector. In addition new companies were allowed to join the industry and apply for a license. Competition Act 1998 gave OFWAT a wider range

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of powers to prevent competition restricting behaviours and the Water Industry Act 1999 made charging schemes subject to the approval of OFWAT (Lehman 2002: 128) and put more focus on customer protection. Tariffs were reviewed and adapted three times, i.e. in 1995, 2000 and 2005 (Furrer 2004: 148). The Water Act 2003, which implemented the most significant changes so far, entered into law in 2005 and replaced the Director General by the *Water Services Regulation Authority* on 1<sup>st</sup> of April 2006 (GWI 2005a: 209). The name Office of Water Services is no longer used; however, the abbreviation OFWAT is now applied to the new regulation authority.

# 3.1.2 Sector Organisation

At present there are 13 *Water only Companies* (WoCs) and 10 *Water and Sewerage Companies* (WaSCs) in England and Wales (GWI 2005a: 199), which operate under a license given to them for a period of 25 years. The geographical distribution and boundaries of the de facto regional monopolies can be seen in Figure 16.



Figure 16: Water Companies of England and Wales. Source: Waterexchange (2006).

For the WoCs there is no legal obligation to provide sewerage services, which led to the situation that in those areas consumers have to rely on the service of two companies. Water only Companies traditionally have been operating mainly in the border regions of the big Water and Sewerage Companies (Spelthahn 1994: 71). Among the main responsibilities of the English and Welsh water companies are the clean and reliable water supply, the compilation of water resource schemes, the issue of drought plans, the promotion of efficient water utilization in the interest of the consumers and the maintenance of an economical and efficient water supply system (Schönbäck et al. 2003: 163). If they do not comply with their responsibilities, OFWAT is in the position to appoint a special administrator (ibid: 166). Contractual relations between the water companies and their customers, however, are governed by private law.

The total annual turnover of the water companies amounts to approximately GBP 10 billion, which equals about 0,7% of the gross domestic product of England and Wales. The turnover is distributed between water supply and sewage collection in almost equal parts (Schönbäck et al. 2003: 185). The biggest company (both in terms of treated volume and annual turnover) is Thames Water, followed by Severn Trent and United Utilities (ibid: 186, Castro et al. 2003: 290). A detailed analysis of the cost structure, accounting methods and finance was prepared by Schönbäck et al. (ibid: 193).

WATER SUPPLY		SANITATION		
Domestic Water Supply	4,72 bn m³/yr	Volume treated	3,83 bn m³/yr	
Potable Water Coverage	100%	Service Coverage	98%	
No. of WTPs	1.858	No. of WWTPs	7.914	
No. of Connections	24,8 mn	No. of Connections	22,77 mn	
Per capita Consumption	150 lpcd	Sewer Network	308.000 km	
Distribution Network	334.413 km	Treatment Type	4% prim.	
Unaccounted-for water	23%		60% sec.	
Meter coverage	23%		36% tert.	

Table 11: Key Performance Indicators (England & Wales). Based on data from GWI (2005: 204).

England and Wales account for a total area of 151.191 km<sup>2</sup> and a population of 51,4 million, which results in a rather high population

density of approximately 340 people per km<sup>2</sup> (Schönbäck et al. 2003: 157). Average rainfall (1961-1990) registered 895 mm and under normal conditions sufficient water resources are available in all regions, although the east and the south due to increasing consumption could face water scarcity in the near future, if no appropriate action is taken (ibid: 158). Water demand is covered by 20% through ground water, the remainder being provided by surface (mainly river) water (ibid). The key performance indicators for the water supply and the sanitation sector are summarized in Table 11.

# 3.1.3 Institutional and Legal Framework

The government department in charge of the water sector supervision is the Department for Environment, Food and Rural Affairs (DEFRA). Economic regulation, in particular price cap determination and control of the water companies, is under the responsibility of the Water Services Regulation Authority (OFWAT), a non-ministerial government department. Based on the Water Industry Act 1991, its primary duty is to ensure the adequate finance of the water companies by controlling the prices they can charge to their customers. Consumer Councils, established by the OFWAT, secure the protection of the consumer's interests. (GWI 2005a: 199). Responsibility for the regulation of water and waste water standards to be met by the water companies is assumed by the Environmental Agency (EA). The functions of the National River Authority (NRA), Her Majesty's Inspectorate of Pollution (HMIP) and the Waste Regulation Authorities have been fully integrated into this new body by means of the Environment Act 1995. Further duties of the EA include flood protection, water resources management and the protection and improvement of the quality of rivers, estuaries and coastal waters. The Drinking Water Inspectorate (DWI) is responsible for monitoring and checking the safety of drinking water and organized as an independent control body (ibid). A minor role in environmental regulation plays the Ministry of Agriculture, Fishery and Food (MAFF), which is in charge of the sludge disposal (Spelthahn 1994: 168).

The *Office of Fair Trading* (OFT) is the body that proactively observes the market regarding consumer protection and competition law and

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advises the secretary of state when a case should be referred to the Competition Commission. The *Competition Commission* (formerly known as *Monopolies and Mergers Commission*) is the watchdog responsible for the assessment of mergers and acquisitions regarding compatibility with the competition laws (Lehman 2002: 129) and plays also the role of a court of appeal in case of disputes between OFWAT and a water company (Spelthahn 1994: 168). A more detailed description of the "regulatory game" was published by Maloney (Maloney 2001: 625).



Figure 17: Institutional Framework in England and Wales.

### 3.1.3.1 Environmental Regulation

Since the 1990s environmental regulation has been coined by European Union Regulation, although the U.K. ignored these standards in the beginning and was even taken to the European Court in 1993 (GWI 2005a: 201). Since then, however, a compliance programme was introduced and today Drinking Water Directive (1980/778/EC & 1994/612/EC, revised 1998/83/EC, in turn driven by the WHO guidelines), Urban Wastewater Treatment Directive (1991/271/EC amended 1998/15/EC) and Bathing Water Directive (1976/160/EC) are the dominant drivers of the English water standard legislation (ibid). Necessary investment to cope with the

Water Framework Directive (2000/219/EC) is estimated at 4-9 billion GBP (ibid: 202). The main English and Welsh laws are the Water Supply (Water Quality) Regulations for England (2000) and Wales (2001). Two large cryptosporidiosis epidemics in 1995 and 1997 which had been caused by contaminated drinking water triggered stricter limits for many parameters and made England and Wales a precursor in cryptosporidium analysis, purification and control (Schönbäck et al. 2003: 224). The protection of inland waters is regulated in the Environmental Protection Act 1990, the Water Resources Act 1991, the Water Industry Act 1991 and the Environment Act 1995. Groundwater norms are additionally set in the Groundwater Regulations 1998.

### 3.1.3.2 Economic Regulation

Economic regulation of the water companies in England and Wales is governed by the system of price-cap regulation introduced in chapter 2.1.6.2.1. Price increases are limited to RPI +/- k, where the factor k includes efficiency gains and necessary future capital expenditure (Lehman 2002: 128). The price limits are set under the responsibility of OFWAT and are the amount by which average bills can change each year. That means that the weighed average change in tariffs for a basket of services is controlled by the price cap (ibid). The applied RPI is the retail price index of the year before the *charging year* which starts on 1<sup>st</sup> of April each year. Ks are set for each company separately under consideration of its particular performance, quality of the service and the business plans including asset management cost (GWI 2005a: 204).

The early British privatizations, such as British Petroleum, posed few competition problems. However, with the privatization of British Telecom in 1984 the Thatcher administration had to encounter the problem of regulating a private monopoly for the first time. In a report submitted to the government by Stephen C. Littlechild in 1983, he proposed to implement the RPI-X approach and set up an independent regulating agency (Beesley and Littlechild 1989: 455). In the beginning it was envisaged that regulation would be replaced by competition (through different technologies and networks) in the medium term, none the less it had to be recognized quickly that competition would be limited in the foreseeable future due to the infrastructure characteristics described in chapter 2.1. When privatizing the water industry therefore the duty of the regulator was already set to only 'facilitate' competition wherever possible. (Pollit 2000: 115).

A particularity of the English regulation system was for more than 15 years that the regulator was not a council, but an individual person, i.e. the Director General of the OFWAT. He had to assure that financing of all necessary investments was guaranteed, an adequate return on the invested capital was ensured, the water companies operated in the most efficient possible way and that the interest of the consumers was considered (Furrer 2004: 149). The Director General was independent of the political process in his decisions and some authors raised the question whether this freedom of regulation concentrated in one single person had not gone too far (Van den Berg 1997: 4, Berg and Blake n.d.: 7). Complaints included mainly the lack of checks and balances and the fact that transparency and the extent of supervision was rather low (Furrer 2004: 150). However, there was also a strong opposite opinion referring to the considerable improvement of disclosure and transparency after the privatization had taken place (Sawkins 2001: 191). In the meantime Water Act 2003 has changed this controversial issue, by replacing the Director General by a council, namely the Water Service Regulation Authority. The key issues to be considered in the determination of the price caps are operating cost, necessary capital expenditure, an adequate rate of return and the value of the original capital basis (Furrer 2004: 149).

A substantial challenge arises out of the problem of asymmetric information between the regulator and the companies. Strategic behaviour, such as the delay of investments or the distribution of incorrect information, can have a positive impact on the review of the k-factors for the water companies. The system will therefore only enhance efficiency if k-factors are exogenic to the firms. A possible solution to this problem is the implementation of yardstick competition as explained in chapter 2.1.6.2.1, where the information of all companies in the market are collectively used for the determination of the k-factors on the basis of lowest-cost, highest-service standards. This method dramatically increases OFWAT's access to information on possible efficiency gains and furthermore boosts the companies' incentive to be better than the average (Spelthahn 1994: 176). Yardstick competition, however, is only effective under the assumption that all companies operate under similar conditions, a scenario which is not valid for the water sector, nor reflected in the price-cap mechanism, where k-factors are reviewed individually for each firm (Van den Berg 1997: 3).

To better address the problem of uncertainty (e.g. unforeseeable changes in the capital markets, stricter environmental regulation, increases in the interest rates etc.) the *Cost-Pass-Through System* (CPT) was introduced. This allows the water companies to pass through costs which are considered outside the control of the regulated company's management directly to the customer in the form of higher prices (Beesley and Littlechild 1989: 463). Whether a specific situation requires the application of the CPT system is analyzed and decided by OFWAT (Spelthahn 1994: 178).

Consumers are either charged at a fixed rate (unmeasured supply) based on a rateable value or for their actual household consumption (metered supply). At the moment only 23% of the households are metered and the consumer in most of the cases has the choice between the two billing methods. Meters are generally installed free of cost. There are considerable differences between average water bills of the different water companies, which in 2004/2005 ranged from annual GBP 211 for Thames Water to GBP 357 for South West Water (GWI 2005a: 206). Connection fees can be determined directly by the water companies without consultation of OFWAT (Schönbäck et al. 2003: 214).

### 3.1.4 Experiences and Outcomes

### **3.1.4.1 Efficiency Gains**

The main focus of analysis of the British privatization programme has been the question whether considerable efficiency gains were able to be
secured and whether the performance of the companies was improved by shifting ownership to the private sector. The number of related publications is legion; however, there is no consensus on the general outcome of the privatization process. There is, however, a common understanding that the productivity of the English public utilities has considerably increased already in the course of the 1980s (hence prior to the privatization) and therefore the potential for further efficiency gains was reduced (Pollitt 2000: 130, Giulietti and Otero 2002: 71). A specific question in this context is also the definition of efficiency and productivity which is not consistent between different publications (Furrer 2004: 152).

#### Vickers and Yarrow hold that

"radical shifts in conduct and performance appear to have occurred in only a few cases, all of which are characterized by a reasonable degree of product market competition" (Vickers and Yarrow 1991: 125),

such as in the case of British Petroleum, but not in the water sector.

Lynk attempts to add empirical evidence to the discussion on public-private efficiency differences by using a stochastic frontier model (SFM). He compares the Statutory Water Companies (now Water only Companies) and the Regional Water Authorities (now Water and Sewage Companies) in a pre- and post privatization context by applying a composed error model to identify the cost frontiers of each group. Deviation from the cost frontier is seen as a measure for inefficiency in his study. Although this approach does not allow a direct comparison of the public and the private sector, the outcome was that

"the RWAs operated at a substantially lower level of average inefficiency relative to their frontier, compared to the SWCs" (Lynk 1993: 99).

#### Parker affirms that

"the overall message from the UK's experience is that privatization with regulation can lead to rapid progress being made in shaking up sleepy state monopolies and providing real gains to consumers as well as investors" (Parker 1999a: 115)

but at the same time highlights that the system had been designed for the UK environment and may not be applicable to other scenarios where necessary institutions are not available (ibid). He argues that it is "surprising how well the regulatory system has performed, in the sense of balancing producer and consumer interests" (Parker 1999b: 232).

An analysis into operation cost efficiency is carried out by Ashton who uses a one-component fixed-effects panel data model. His study differs from previous ones mainly in the use of various econometric techniques. According to his results, overall cost efficiency is estimated to be 84%, which is only moderate and leaves space for improvement (Ashton 2000a: 455). In a second study Ashton uses a time trend model to analyze total factor productivity growth and technical change in the water industry and comes to the conclusion that no improvements can be observed since the 1989 privatization (Ashton 2000b: 121). While and Haughton's findings, none the less, show considerable increase in innovation (While and Haughton 2001: 721).

Saal and Parker apply a multiple translog cost function to estimate production cost in the industry and conclude that

"the WASCs' costs were characterized by diseconomies of scale as well as capitalaugmenting/labor-saving technological change" (Saal and Parker 2000: 264).

Their analysis reveals that efficiency gains were only achieved after the 1995 price review, when the regulative corset was tightened (ibid). In their 2002 study they elaborate on a comparison of productivity, price and financial performance in the pre- and post-privatization period and confirm their results of 2001 (Saal and Parker 2001: 61).

#### 3.1.4.2 Price Development

The average household price for water has increased for unmetered households by 45,3% from 1989 to 2007 and decreased by 7,8% for metered households in real terms. Since the majority of English households is not metered, the total average price has risen by a real 39,1% since the privatization took place. Currently the average household bill for water and sewerage amounts to GPB 294,- per year (OFWAT 2006a: 1). During the first period after privatization from 1990 to 1995 price cap increases were set considerably high to provide the funds necessary for the finance of overdue investments. This resulted in remarkable profits for the water companies and is supposed to have been an incentive imposed by the

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Thatcher administration to make the privatization more attractive for potential investors (Furrer 2004: 158).



Figure 18: Annual Price Limit Development (England and Wales). Based on data from OFWAT (2006b: 116).

Further reasons, however, included that construction cost had fallen substantially, capital cost assumed by OFWAT had proven to be too high and inefficiencies of the public companies had been higher than expected, which made it easy for the private operators to improve efficiency for the benefit of their own accounts (ibid).

Average Annual Price Limit Increase	1990-1995	1995-2000	2000-2005	2005-2010
WaSCs	+5,0 %	+1,4 %	-1,5 %	+4,3 %
WoCs	+6,1 %	+0,4 %	-2,4 %	+3.1 %
Industry Average	+ 5,2 %	+1,3 %	-1,6 %	+4,2 %

Table 12: Average Annual Price Limit Increase in England & Wales (1990-2010).Based on data from OFWAT (2006a: 1).

In the 1995 price review price increases for the 1995-2000 term were set much more moderately and for the first time also consumers were included in the decision process. The review of 2000 even brought about real price decreases for the average consumer.

#### 3.1.4.3 Capital Expenditure

The development of investments in the English and Welsh water sector from 1920 to the present shows two slumps that are significant, i.e. first, after the Second World War and second, in the 1970s, when government expenditure and municipal subsidies were cut dramatically in the wake of the economic crisis, which was one of the most important triggers for the privatization (Spelthahn 1994: 183).

Average Annual Capital Expenditure [GBP]	1980- 1985	1985- 1990	1990- 1995	1995- 2000	2000- 2005	2005- 2010
WaSCs	1,5bn	1,9bn	3,3bn	3,5bn	3,1bn	3,2bn
WoCs	n/a	n/a	0,2bn	0,3bn	0,2bn	0,2bn
Industry Average	n/a	n/a	3,5bn	3,8bn	3,3bn	3,4bn

Table 13: Average Annual Capital Expenditure in England & Wales (1980-2010). Based on data from OFWAT (2006a: 2).

Investment targets are fixed in so called *Asset Management Plans* (AMP) where the companies have to provide their planned levels of capital expenditure for the five-year-term and price caps are set by OFWAT accordingly (Furrer 2004: 159). Since water and sewerage services in England and Wales operate on a full-cost recovery principle, tariffs must allow for operation and infrastructure improvement programs (GWI 2005a: 207). Between 1989 and 2010 more than GBP 67bn will have been invested in the improvement of drinking water quality and environmental standards (OFWAT 2006a: 2). For the first 1990-1995 period it can be asserted that investment targets have been met (Furrer 2004: 159) and fears that the sunk cost had not been considered sufficiently in the regulators' calculations proved to be wrong (Vickers and Yarrow 1989: 422). However, due to the high price caps, most of the investment was done out of operating revenues without recurring to debt finance (Furrer 2004: 160).

Van den Berg refers to the fact that price-cap regulation in many cases worked more like rate-of-return regulation and may have been an incentive for gold-plating. Second, separation of economic and environmental regulations made the creation of incentives for 'right' investments more conflictive. Furthermore OFWATs mandate to ensure the viability of investments is limited and sometimes public cost and benefits are not taken into consideration (Van den Berg 1997: 2).

From 1995 on, the format of the AMPs changed and the companies had to provide strategic business plans. Although the applied methods were considerably improved and resulted in more reliable data, one of the drawbacks of the new system is its vulnerability to gold-plating (Booker 2006: 72). A further disadvantage is that companies fix their capital expenditure in accordance with the regulation cycle which can lead to heavy delays in necessary investments (Van den Berg 1997: 2). Additionally, it is the regulator who finally decides on which investment will be accomplished and not the companies. Due to his lack of sufficient information to take this decision, he has to hire additional consultants to check the companies' business plans (Pollitt 2000: 121). Moreover he has to balance the needs of all involved stakeholders (Scheele 1997: 44).

#### 3.1.4.4 Profits & Directors' Remuneration

One of the most controversial topics concerning the English water sector privatization is the issue of company profits, which (at least during the first years) were considered to be far too high, when comparing them with international benchmarks (Parker 1997: 305, Hall and Lobina 1999: 6). Particular criticism was triggered by the fact that profits (on average 24% in the 1990s) were far beyond the cost of capital in the industry (around 6-9%). Although the tightening of the price caps during the first review in 1995 put pressure on the profitability of the companies, profit margins in the water sector remained above the international industry figures (Parker 1997: 310). Parker mentions as possible reasons for this phenomenon the relatively short period of time that had passed since privatization by then, the impact of under-pricing on floating the shares and distorting effects of takeovers (and the associated premiums) in the industry (ibid: 311), to which Furrer adds the issues of high regulation risk, low competition and lax price caps (Furrer 2004: 162). Hall and Lobina claim that UK water profit margins are typically three to four times as high as the international standards, but unfortunately do not attempt to provide an analysis of their data (Hall and Lobina 1999: 6).

A particular change in paradigm has also been triggered by the constitutive role of accounting methods introduced with the new private regime. Organizational objectives were redefined, vocabulary of costs was integral to management's articulation of new organizational imperatives and corporate culture changed with new methods and language. Generally speaking the concept of profit now plays a considerably stronger role than in the pre-privatization era (Ogden 1995: 215).

The transition to the private sector brought about also private incentive structures for the water companies' directors remuneration which in the public sector in most cases had not been performance related (Ogden and Watson 1996: 721). Criticism arose from the fact that financial gains were substantially above those of other average company directors and that many of the directors made huge profits out of their share options due to the under-pricing of the shares at the time of privatization (Samuels and Piper 1998: 174, Lobina and Hall 2001: 12).

# 3.1.4.5 Environmental Aspects

An implication of price-cap regulation is that it creates an area of conflict between price and quality. There is no incentive for the involved water companies to improve quality since they will not be remunerated for the extra cost incurred. Quality (and hence environmental) aspects have to be regulated separately to ensure desired minimum requirements. A fundamental drawback of this system is that companies will focus on those measures of quality the regulator focuses on and not the ones the customers might find important (Pollitt 2000: 119).



Figure 19: Number of Enforcement Actions in England and Wales. Based on data from DWI (2001: 157).

The first ten years after privatization brought about investment of around GBP 33 billion which had the desired effect on water quality (Saal and Parker 2001: 66), subsequently, however, quality enhancement began to decline and diminishing marginal returns to environmental investment can be attested (ibid: 77). Nevertheless it has to be pointed out that the number of enforcement actions (i.e. a measure that has to be taken by the Secretary of State if drinking water standards are not met by a specific company on a permanent basis) has been reduced from 648 in 1990 to 1 incident in 2003 (Figure 19).

In the late 1990s the establishment of local environment agency plans (LEAPs) provided an important improvement in sustainable environment management (Jones 1999: 12). Additionally the government made clear that in the 2005-2010 regulation period, environmental issues shall again have top priority on the regulator's agenda, even if this has to be accomplished by means of price increases. (Furrer 2004: 163). Pressure comes particularly from the E.U. Water Framework Directive. Although the general view regarding environmental aspects can be considered considerably positive (Hopkinson et al. 2000: 873) there are also authors who claim that the privatization is responsible for water scarcity such as the 1995 Yorkshire drought (Bakker 2000: 4). Furthermore there have been requests to improve the environmental performance indicators (Johnston and Smith 2001: 8).

#### 3.1.4.6 Competition

Competition is in principle restricted in the English and Welsh water sector due to the regional monopoly organization of the water companies and long 25-year licenses, which expire in 2014. Though the government is theoretically in the position to terminate the licenses, the notice period is ten years (Jones 2000: 54, Schönbäck et al. 2003: 167).

In order to promote competition, Water Industry Act 1991 and Competition Act 1998 introduced several mechanisms. *Inset Appointments* are available to larger consumers with a consumption of more than 100.000 m<sup>3</sup> (originally 250.000 m<sup>3</sup>) per year, who are in the position to select their suppliers independently of the regional monopoly. *Borderline Competition* enables consumers to connect to the network of an adjacent provider if coming up for the connection cost themselves. Finally, *Common Carriage* should enable water companies to supply through the networks of their competitors as it is already best practice in the electricity and telecommunications sector. Application conditions for this mechanism were, however, set so restrictively (via access codes) that competition through common carriage is not to be expected at the moment (ibid: 166).

Particular competition can be found in the input market to the water industry, since there has emerged a strong tendency to contract out different kind of services to specialized contractors. Additionally yardstick competition is applied increasingly in the regulation process in order to specifically put pressure on less efficient companies. A last form of competition is the competition for equity and control of the companies. Due to the private ownership, companies may be taken over at any time, which exerts pressure on the management to improve efficiency (ibid: 192, Furrer 2004: 85, Sawkins 2001: 189).

### 3.1.4.7 Consumer Satisfaction

Ogden and Anderson carried out the first post-privatization analysis of the representation of consumers' interests in the privatized water industry. They come to the clear conclusion that regulatory arrangements have been improved substantially and that post 1989 customer service committees (CSC) provide a by far better representation of the customers' interests than the former consumer consultative committees (CCC). Particularly the influence in the price review process has been seen as a strong advancement in the protection of consumer rights (Ogden and Anderson 1995: 535). A second study accomplished in 1999 was mainly dedicated to the relationship between shareholder and customer interest and the results show that,

"although improving relative customer service performance is costly for firms in terms of current profits, shareholder returns correspond in a significantly positive manner to such improvements" (Odgen and Watson 1999: 526).

Morse, however, affirms that there is customer discontent with private utilities, especially since bills have gone up considerably, while the companies' profits continue to rise. A second reason for consumer disquiet was the 1995 drought (Morse 2000: 489). Ogden and Clarke emphasize in this context the importance of corporate reporting as a resource in legitimacy management (Ogden and Clarke 2005: 313). A report on latest tendencies, concerning the affordability of household water and sewerage services, give Sawkins and Dickie (Sawkins and Dickie 2005: 225). According to OFWAT statistics the number of consumer complaints rose from 1996 until 1999 and has been decreasing slightly since then. Distribution of the subject of the complaints was as follows: 41% on tariffs, 29% on the quality of service, 8% on the quality of the drinking water and 22% on others (Schönbäck et al. 2003: 235). However, further surveys suggest an increasing consumer satisfaction with the water services (ibid).

## 3.1.4.8 Employee Satisfaction

The number of personnel employed in the English and Welsh water companies has been decreasing steadily over the past decades, both before 1989 and after the privatization. The specific reasons are therefore on the one hand efficiency gains in the industry, but also an increasing tendency to contract out services to third parties (Schönbäck et al. 2003: 183).

	1980	1985	1990	1995	2001	2005
Number of Employees	71.400	59.700	44.600	43.500	31.900	

Table 14: Water Sector Employees in England & Wales (1990-2010). Based on data from Schönbäck et al. (2003: 183).

In principle privatization was unpopular with the majority of the employees, since a strong fear of redundancies was associated with it. Managers naturally have felt empowered by the privatization, mainly due to the increased autonomy of the water companies (Harris 1994: 126). Particular criticism comes from Hall and Lobina who claim that the water companies cut jobs to meet the reduced price caps without decreasing their own profits (Hall and Lobina 1999: 3, Lobina and Hall 2001: 15).

#### 3.1.4.9 Mergers and Acquisitions

Since 1989 several mergers and acquisitions took place in the industry and the number of water only companies was reduced from 29 to 16. Part of the water companies has presently international main shareholders, particularly the French groups Suez and Veolia have been busy investing in British water. There are tendencies in the industry to form a big British water enterprise as counterpart to the French, OFWAT, however, has opposed these plans (Schönbäck et al. 2003: 190). Mergers are regulated by the concept of comparative competition (Weir 2000: 811).

## 3.1.4.10 Regulatory Performance

The performance of the regulators has been unanimously praised to be very efficient throughout academic literature over the past two decades. Beesly and Littlechild state that

"regulators have taken seriously their duty to promote competition, and that in so doing they have implicitly gone beyond traditional welfare economics" (Beesley and Littlechild 1989: 466).

Van den Berg, however, states that

"it is still early days for the new regulatory model. But the experience so far has shown that the tools of price cap regulation are both complex to administer and critical" (Van den Berg 1997: 3)

and refers particularly to the process of yardstick competition and the risk of regulatory capture where she find still room for considerable improvement (ibid: 4).

A series of investigations was carried out by Morana and Sawkins on the volatility of water shares in the stock market and the reaction to regulatory actions such as the periodic price reviews. The results confirm investors' confidence in the credibility and political sustainability of the system (Morana and Sawkins 2000: 87, Morana and Sawkins 2002: 185, Morana and Sawkins 2004: 189).

# 3.2 France

France and its water companies Suez and Veolia have traditionally been major players in the international water markets and a large number of French municipalities apply one or another form of PSP to their water provision. In addition, the French water model, with its privatization by means of delegation contracts, was repeatedly favoured by international donor organizations such as the Worldbank and has hence evolved to be the most widely used PSP approach at a worldwide level.

# 3.2.1 Historical Context

The origins of French private water date back to 1782, when the first concession contract for the water supply of the Paris area was signed between the brothers Perier and the Municipality of Paris. The nineteenth and twentieth century consequently saw a continuous growth of the private water sector, triggered mainly by the foundation of *Compagnie Générale des Eaux* in 1853 (today part of the Veolia group and France's largest water operator), *Societé Lyonnaise des Eaux* in 1880 (today part of the Suez group and France's second largest water company) and *Societé d'Amenagement Urbain et Rural* (SAUR) in 1933 (Spelthahn 1994: 128), all of which joined forces with important French finance companies after the Second World War (Schönbäck et al. 2003: 295, Hall 1999: 5).

Contrary to the majority of the rest of the industrialized countries France has not suffered setbacks in their private water approach so far, although almost the entire rest of Europe at least temporarily transferred their water utilities to the public sector in the course of the 20<sup>th</sup> century. Particularly the reconstruction era after the Second World War triggered a boom and the vast majority of today's water infrastructure dates back to the post war decades. The installed base of waste water treatment plants, however, was mainly constructed in the 1970s (the number of plants increased from 1500 to 7500 in this decade) (Spelthahn 1994: 129). From the 1960s on, the government started a programme to reorganize the complete public sector. Responsibilities were shifted from the centralized state to the municipalities, which, not having the expertise and capacities to assume these newly assigned tasks, had to revert to the private sector and delegate many of the services (Schönbäck et al. 2003: 295, Elnaboulsi 2001: 512). An important driver was the 1964 Water Act which led to the foundation of the 6 *agences financières de basin* and gave financial incentives to the municipalities via subsidies (Spelthahn 1994: 129).

During the 1990s French delegation contracts, however, became the object of criticism. Lack of transparency and rising water prices finally gave sufficient reasons to change water legislation in order to provide improved control mechanisms. The 1993 Sapin Law was intended to improve the legal framework for bidding procedures and had important consequences for the French concession and Affermage contracts. Among other stipulations the maximum contract term was set at 25 years and the roles of the concerned authorities and their interplay was defined much more precisely. Before this important law bidding procedures had not been regulated in any standardized form. In 1995 the Barnier Law even further decreased the contract term to a maximum of 20 years. More recent legal acts include the 1999 Chevènement Law, aimed at strengthening and simplifying co-operations between different municipalities (in the form of communautés d'agglomeration, communautés urbaines and communautés de communes), and a 2005 law on transparency improvements in the French water sector. Under the latter arrangement companies are forced to produce a list of planned investment for the contract term and have to compensate the authorities for uncompleted works at the end of the period (GWI 2005a: 89, Elnaboulsi 2001: 513).

## 3.2.2 Sector Organisation

French water management is "deeply rooted in the spatio-political subdivision of the French territory and the French Democracy" (Elnaboulsi 2001: 511) and organised on the level of the appr. 36.000 *communes,* hence at the municipal level, where mayors are responsible under the *Communal Code* for the supply of public services (ibid). Water and wastewater services are provided either directly by the municipality (or a syndicate of municipalities), .i.e *régie,* or delegated to a private entity under the contract varieties *affermage* and *concession.* On a geographical level France is divided into six basin regions, each of which has a water

agency (*agence de l'eaux*) with responsibility for the management of water resources within the region.



Figure 20: French River Basins. Source: Agences de l'Eau (2007).

France accounts for a total area of 543.965 km<sup>2</sup> and a population of 60,7 million, which results in a population density of approximately 112 people per km<sup>2</sup> (Schönbäck et al. 2003: 263). Average rainfall (1961-1990) registered 800 mm, however, there is large geographical variation over the country. Water demand is covered by 24% through ground water, the remainder being provided by surface (mainly river) water (ibid: 265). The key performance indicators for the water supply and the sanitation sector are summarized in Table 15.

WATER SUPPLY		SANITATION			
Domestic Water Supply	5,6 bn m³/yr	Volume treated	3,1 bn m³/yr		
Potable Water Coverage	99%	Service Coverage	93%		
No. of WTPs	14.615	No. of WWTPs	14.916		
No. of Connections	21,9 mn	No. of Connections	15,77 mn		
Per capita Consumption	150-200 lpcd	Sewer Network	250.000 km		
Distribution Network	850.000 km	Treatment Type	mainly		
Unaccounted-for water	15-40%		secondary		
Meter coverage	100%				

Table 15: Key Performance Indicators (France). Based on data from GWI (2005: 92).

The total water market volume amounts to EUR 12,65 billion, of which the total annual turnover out of water supply and sanitation accounts for EUR 10,2 billion. Revenues are distributed as follows: 46% go to local authorities, 35% to private operators and 19% are related to taxes and other levies. Around 76% of the population (i.e. 46 million people) are consumers of private water companies (Schönbäck et al. 2003: 296). A particular problem of France is that the market has evolved to be an oligopoly, developed by the three French multinationals Veolia, Suez and SAUR, a situation that makes effective competition difficult (ibid: 297).

OPERATOR	WATER SUPPLY	SANITATION		
Régies	25%	54%		
Générale des Eaux (Veolia)	38%	18%		
Lyonnaise des Eaux (Suez)	21%	14%		
SAUR	10%	7%		
Others	6%	7%		

Table 16: Market Distribution by Population (France). Based on data from GWI (2005: 86).

There is none the less an increasing tendency that small competitors enter the market. In addition the E.U. is putting pressure on France, since historically not one single contract has been awarded to a non-French company so far (although some U.K. companies tried tocompete). French private water management is carried out exclusively via delegation contracts. Divesture of assets, as in the UK is not common, although there is a continuous political discussion on adapting the UK model for France. A detailed analysis of cost structure, accounting methods and finance was prepared by Schönbäck et al. (Schönbäck et al. 2003: 310). Heald elaborates on the specific particularities of concession accounting (Heald 1995: 325).

CONTRACT TYPE	SHARE
Affermage	95%
Concession	5%

Table 17: Delegation Contracts by Number of Contracts (France). Source: Ménard and Saussier (2003: 17).

## 3.2.3 Institutional and Legal Framework

At a national level the overall responsibility for the water sector is shared between the *Ministère de l'Interieur* (Ministry of Internal Affairs), the *Ministère de l'Aménagement du Territoire et de l'Environnement* (Ministry of Environment) and the *Ministère de la Santé* (Ministry of Health). Their responsibilities include the supervision of water resources, water quality and drinking water quality (GWI 20005: 84). The *comité national de l'eau*, is made up of important interest groups, such as agriculture, industry and private consumers, and serves as a consultant to the government, when projects of national importance are under review (Schönbäck et al. 2003: 268). The execution of water legislation is incumbent upon the *préfets* of the 95 *départements* which represent the central government vis-à-vis the local authorities. The *mission interservice d l'eau* is in charge of supervision and control of water execution (ibid).



Figure 21: Institutional Framework in France.

Each of the six river basins has an *agence de l'eau* (water agency, formerly *agence financière de bassin*) whose main responsibility is the management of the region's water resources. They ensure the protection and restoration of surface and underground water, and the development and quantitative protection of the resources with the overall goal of guaranteeing public health. Among their most important competences are

the funding of the municipality's capital expenditure programs and the determination of the water tariffs. They are supported in their tasks by a Comité de Bassin (Basin Committee) which is made up of important stakeholders of the water sector. The committee's main responsibility is to ensure the involvement of all stakeholders in the decision-making process and determination of the water policy (GWI 2005a: 84) and the water budget (schema directeur d'aménagement et de gestion des eaux) (Schönbäck et al. 2003: 268). The main responsibility for the provision of drinking water and sanitation services, however, is vested by the 36.772 communes (Municipalities) which operate on their own or as part of an intercommunal syndicate. In spite of this municipal concentration of responsibility, the political power of the communes is, however, rather low (Schönbäck et al. 2003: 277). Nevertheless, the mayor of a municipality is personally liable for any damage due to negligence on his part and therefore may reduce his risk exposure by delegating the water services to a private company (Clark and Mondello 2000a: 103).

# 3.2.3.1 Environmental Regulation

The quality requirements and necessary control mechanisms for drinking water, as well as the standards for sewage disposal are regulated in the *code de la santé publique* (Schönbäck et al. 2003: 273). France is committed to meet the E.U. water framework directive and urban wastewater directive and there has been considerable investment to meet this target. Despite this investment, France is behind in plans to meet standards and considerable further expenditure (in the range of 2,5 bn EUR annually) will be necessary by 2015 (GWI 2005a: 89).

#### 3.2.3.2 Economic Regulation

The French model is based on the principle of regulation via competition for the field, where the provision of water related services is tendered to private operators based on delegation contracts. There is no independent price regulatory body, the prices are generally negotiated between private operator and municipality (Nauges and Thomas 2000: 68) in the course of the tendering process (up to the 1986 decree on price regulation it had been the responsibility of the central government). General tariff related regulation in France is rather poor, only the 1992 Water Law requires water bills to be itemized into categories in order to enhance transparency (Lehman 2002: 92).

The price setting mechanisms of individual contracts may be of various natures. Contracts on a cost-plus-fee basis require annual negotiations between operator and municipality in order to fix prices based on the budget. In case the prices are fixed for the total term of the contract, prices are normally indexed and adjusted by efficiency factors. The flow of the funds is dependent on the contractual arrangement: under a concession total revenue goes to the concessionaire, whereas under an affermage agreement only a part of the total revenue is retained by the private operator, the remainder being transferred to the municipality to cover capital expenditure. Due to the various taxes and fees levied regionally on the tariffs, price structures may be of very complex nature (ibid). A fundamental principle of water management in France is l'eau paye l'eau (i.e. full-cost recovery), meaning that water prices should come up for all involved cost of operation and investment requirements (GWI 2005a: 92). For a typical residential water bill (i.e. a 120 m<sup>3</sup> monthly consumption) 42% of the bill are to cover the provision of water supply, 31% are to cover sewage services and the remaining 27% are taxes of various natures (Lehman 2002: 93).

#### 3.2.4 Experiences and Outcomes

#### 3.2.4.1 Efficiency Gains

The French rationale for private provision of water services has traditionally been the inefficiency of the public sector due to lack of technical know-how, lack of financial power to come up for necessary investments and lack of skilled personnel to operate the plants and it is assumed that the private sector can compensate these deficits (Elnaboulsi 2001: 523).

Unfortunately, there is limited empirical evidence regarding the relative efficiency of the different forms of water management in France (public vs. private). Some authors try to compare price and investment levels (Orwin 1999: 1, Buller 1996: 461), others try to focus on the decision-making processes in the various organization forms (Ménard and Saussier 2000: 385), but no significant conclusion can be derived from these studies (Renzetti and Dupont 2003: 16). Proponents of the model, however, claim that the delegation contracts

"have created the conditions for an effective system of market based autoregulation that maximizes community welfare while maintaining a fair return for the delegated firm" (Clark and Mondello 2003: 317).

Furthermore, nonetheless, they state as conditions that the threat to revoke must be credible and the conflict of interest between the mayor and the commune must be resolved (ibid).

#### 3.2.4.2 Price Development

Average prices for water supply and sanitation have been increasing steadily during the 1990s, particularly the first half of the century showed considerable two-digit growth in tariffs (Figure 22). The main drivers for this development are the increase in sanitation tariffs and a surge in fees levied by the water agencies (Schönbäck et al. 2003: 328) For 2000 an amount of EUR 344,59 is given as average household water bill (ibid).



Figure 22: Annual Price Development (France). Based on data from Schönbäck (2003: 328).

The heavy increases in the early 1990s are attributed mainly to the implementation of European directives (particularly the urban wastewater directive). Recently, after a decade of sustained growth, French operators

had to face stabilization of the tariffs which have been close to the inflation rate over the last years. A slight increase on the sewage side, however, is expected to meet European Union targets. A department-level analysis, besides, shows that differences between the regions are significant (Lehman 2002: 100). The French *Cour des Comptes* (audit court), however, reports also some cases of unjustified price increase without legal cause. Tariffs in St.Etienne and Egleton rocketed 124% and 200% respectively within three years after awarding contracts to private operators (Furrer 2004: 214). An economic evaluation of French water pricing was elaborated by Garcia and Reynaud (Garcia and Reynaud 2004: 1). There have also been some attempts to prove that due to the involved high transaction costs, delegating contracts results in higher tariffs (Chong et al. 2006a: 149, Chong et al. 2006b: 521).

# 3.2.4.3 Capital Expenditure

The highly decentralised structure of the French water sector makes data collection and complete overview on capital expenditure difficult, since the availability of reliable figures is rather poor. One of the major trends however has been a decrease of capital expenditure in the course of the 1990s, which in light of the investment requirements based on the E.U. directives is highly surprising.

Average Annual Capital Expenditure [EUR]	1990	1995	1998	2002
Water Supply	2,2 bn	1,8 bn	2,1 bn	1,6 bn
Sanitation	3,9 bn	3,8 bn	3,7 bn	3,0 bn
Total Water Sector	6,1 bn	5,6 bn	5,8 bn	4,6 bn

Table 18: Average Annual Capital Expenditure in France (1990-2002). Based on data from Schönbäck et al. (2003: 311).

Interestingly only 700 million EUR of investments is carried out and financed by private operators. This means that the private sector provides services for 70% of the population but comes up for only 18% of total capital expenditure. The main share of investments is effected by water agencies and municipalities (GWI 2005a: 94). Key investment drivers for the next decade will be to meet the EU legislation targets (ibid: 95).

## CHAPTER 3

#### 3.2.4.4 Profits and Director's Remuneration

Totally contrary to the English and Welsh water sector no figures are available on company profits and director's remuneration in the French market. The only public numbers are consolidated annual reports of the exchange listed parent groups Veolia and Suez which do not show sufficient details for a well-founded analysis of the French water model. Lack of transparency has been a traditional shortfall of the system and the government has made this issue a key topic during the last decade.

#### **3.2.4.5 Environmental Aspects**

In connection with the implementation of the water framework directive the French authorities are currently dedicated to the installation of an extensive environmental monitoring system. The quality of French water resources is considered to be satisfying and particularly the organic loading of rivers was reduced considerably over the last two decades (Schönbäck et al. 2003: 264). A distinguishing feature of the French model is that in principle three companies are operating the total water sector and know-how development and interchange between the different municipalities is favoured (ibid: 278), which has a positive impact on environmental protection.

#### 3.2.4.6 Competition

The competitive mechanism of the French model is the so-called franchise bidding where competition takes places for the market rather than within the market. Although enhancing competition, a host of problems is associated with tendering delegation contracts, based particularly on the lack of transparency of the process and the high negotiation power of the private operators.

Only since the competition laws of the 1990s the situation has slightly improved, however, due to the extremely low number of potential bidders the competitive moment of auctions is rather low. Joint ventures between the major players and collusion further limit competition (Furrer 2004: 216). Some authors refer to the cartelized nature of the French water sector (Clark and Mondello 2000b:327). Due to the complex nature of the

subject matter contracts have to be incomplete and renegotiation is highly common (Bance 2003: 33). Asymmetric information and the prohibitive cost involved in changing the operator, in many cases put the private operators in the situation to dictate the municipalities their requirements. A further typical aspect is the so called *buy in*, since the French companies have evolved to be multi-utilities and offer a broad portfolio ranging from energy to transport services. Once they have been awarded a contract they normally have an advantage when bidding for further services within the same municipality (ibid: 217). Hence, once delegation has been undertaken, it is virtually irreversible (Clark and Mondello 2000b: 325). Furthermore EPC sub contracts for the construction of new infrastructure are in some cases awarded to subsidiaries at higher prices (Elnaboulsi 2001: 533). Additional critics refer to occasional collusion between municipality and private operator for the purpose of *rent seeking* to balance municipal budgets by means of entry fees (Furrer 2004: 218). A famous example is the corruption case in Grenoble, where the mayor and a Lyonnaise des Eaux manager were sentenced to prison (Hall and Lobina: 2001: 5, Nissan et al. 2004: 305). In a second case the contract in St. Etienne was disallowed by a court for a 1,13 bn FRF entry fee (Boschek 2002: 144).

A further system deficit is the absence of ex-post competition. There are not many cases where after expiration of the contract term the renewed contract was not given to the original operator. Relations between the private company and the municipality normally evolve to be very strong and both parties have strong incentives to continue the cooperation. Contract renewal sometimes took place without bidding procedure, but even when the contract is put out to tender, due to better information, the original operator has clear advantage against the competitors (ibid). Some of the shortfalls of the system have been remedied by the competition laws of the 1990s; however, the inherent deficiencies of the model will not disappear. Further competitive impetus is given by EU pressure to open the market for non-French companies and it is to be expected that a major contract will be awarded to an international player before 2015 (GWI 2005a: 97).

# 3.2.4.7 Consumer Satisfaction

In a 2002 survey 59% of the French stated that they were drinking tap water at least once a week. In 1989 this number amounted still to 72%. The main reasons given were bad taste and the high water hardness of the drinking water; however, health risks were not named frequently. In general the French feel comfortable with their water and only 33% are of the opinion that water quality has declined over the past ten years. The readiness to pay tariffs is with 99% traditionally high in France (Schönbäck et al. 2003: 346, ibid: 352). Along with the international trend also in France privatisation debates have become day-to-day business in the political arena. The multinationals are accused of making huge profits to the disadvantage of final consumers, without taking care of the necessary investments. Interestingly in France national pride on the international success of the French multinationals exceeds by far the call for a lower private influence in the provision of infrastructure services. In addition, consumer interest in this debate is not very high and many French do not even know which company is in charge of their water provision (Schönbäck et al. 2003: 278).

## 3.2.4.8 Employee Satisfaction

Statistically the occurrence of strikes is the lowest in the sector of public services provision. The French model allows for the obligatory transfer of all employee contracts from the public sector to the private operator. Traditionally, staff reduction consequently took place by not replacing retiring employees, a model that contributed significantly to the acceptance of privatizations and securing social consent. However, there is a trend towards questioning this old-established tradition, since competition between the companies is increasing (Schönbäck et al. 2003: 356). Currently there are a total of 69.000 employees in the French water industry, of which 43% are employed by private operators. This number has been relatively stable over the last years (ibid: 298).

## CHAPTER 3

## 3.2.4.9 Inter-company Cooperation

Mergers and acquisitions do not play a major role in the French water market, as it is the case in the U.K. sector. There is, however, another interesting trend which has evolved over the last years, i.e. the trend to form joint ventures or consortia between the big multinationals for several big contracts. This is particularly true for the international growth markets such as Latin America and Central and Eastern Europe but also in their French home market some projects have been awarded to cooperative tenders of big French market players (Schönbäck et al. 2003: 308). In Paris, for example, the right bank of the Seine river is operated by a subsidiary of Générale des Eaux and the left bank by a subsidiary of Lyonnaise des Eaux. Joint ventures of the two companies are operating the cities of Marseille, Lille and Versailles (ibid: 305).

#### 3.2.4.10 Transparency

Lack of transparency has been a traditional shortfall of the system and its improvement the political imperative of French governments over the past decade. Particularly the 1993 Sapin law enhanced the situation substantially and bidding procedures are becoming more traceable and comprehensive (GWI 2005a: 95). There is now a potent call for the disclosure of delegation contracts and annual reports, which would not only allow the political control of the system but also provide information for the benchmarking of the industry (Schönbäck et al. 2003: 280). A major role in this process play the consumer organizations which have gained political importance and have contributed considerably to the public discussion on transparency issues (Peinoit 2002: 38).

# 3.3 Germany

Germany, contrary to the cases of the UK and France, has so far not put forth a typically, unique and characteristically German model of private sector participation. The distinctive feature of the German water sector is its rich variety in different approaches, reflecting both the decentralized federalist political system and the historical and cultural background of high autonomy and power of the local municipalities.

# 3.3.1 Historical Context

Traditionally the German legal framework provided possibilities for PSP in the water supply sector; however, sanitation was for a long time considered to be a service of general economic interest (*Daseinsvorsorge*) and its provision therefore restricted to the public sector. Early PSP in waste water treatment was nevertheless possible in the industrial sector. As early as 1961 private sector participation in the water sector became part of the political agenda in the then Federal Republic of Germany. The "mother of water privatisation models" (Rudolph 2000: 1) was a quasiconcession contract working in the city of Nordhorn since that year. During the 1980s PSP gained momentum and particularly Lower Saxony became the key driving force in implementing the first full service tender BOOT model in the town of Algermissen in 1985. Discussions had been triggered by Birgit Breuel, minister for economic affairs and transport, in 1979 and PSP was made legal finally by an amendment to the Lower-Saxon water act (NWG) in 1982. In the wake of the Algermissen contract several further municipalities, including Wesendorf, Wedemark, Neuenhaus, Wagenfeld, Bad Laer, Hambühren and Dahlenfeld, took the decision to implement the so-called Betreibermodell (operator model) for their water infrastructures (Spelthahn 1994: 95). The first cooperation model was carried out in Sittensen in 1990 (Rudolph 2000:1, Rudolph 2001: 45) and the first model similar to a concession contract was implemented by the city of Schwerte in 1993 (ibid).

An important trigger for the further development of German water PSP was the 1990 reunification with the ex-communist Eastern territories and the related need for infrastructure expenditure, but limited financial resources. Mainly for budget reasons, many ex-DDR municipalities opted for PSP and in 1992 Rostock was the first city to privatize both its water and wastewater systems in a combination of concession and BOT contract (ibid). Consequently new models, such as for example an asset lease and operation contract for Leidersbach in 1998, were developed and the trend finally peaked out with the partial privatization of the water utilities of the big city states of Bremen and Berlin in 1998 and 1999, respectively (ibid: 2).

Since then, privatisation efforts have slowed down, and compared to the development of the energy sectors during the 1990s, the water sector has proven to be resistant to liberalisation trends. The topic was somehow revived by the Ewers-report (Ewers et al. 2001), commissioned by the federal economy ministry to analyse possible actions for improvements in the German water sector, which was followed by a 2002 parliament resolution including the harmonisation of fiscal arrangements, an amendment to municipal law and federal-wide law to allow privatisation of wastewater assets and the introduction of benchmarking systems (GWI 2005a: 114). Generally speaking, Germany can be assumed to be a latecomer in PSP in infrastructure services and some authors refer to it as a "developing country in this respect" (Hirschhausen et al. 2002: 8). As a result of the global anti-privatization tendencies, a large part of the population and many politicians remain sceptical and further political work and public campaigning will be necessary to further implement PSP models in Germany.

#### 3.3.2 Sector Organisation

Similarly to the French water sector organisation the nature of the German system is based on decentralization and high autonomy of the federal states and individual municipalities. Whereas framework legislation lies with the central government, each federal state has its own federal state laws regarding water management. The ultimate responsibility for the organisation and implementation of water infrastructure is a traditional duty and constitutional right of the municipalities; however, any delegation of services to a private operator has to be approved by the federal state authorities. The German water sector is highly fragmented, counting around 6500 water companies and 7000 waste water companies, ranging from substantial companies to very small parish-based enterprises (GWI 2005a: 99; Lehman 2002: 104). A typical and common structure is the multi-utility municipal company (*Stadtwerke*), where electricity, gas, district heating, and water and wastewater services are provided under one umbrella (ibid). For smaller municipalities it is common to join forces with neighbour municipalities by forming special purpose associations (*Zweckverband*) (ibid: 100). Hydrographically Germany is divided into six river basins (Rhine, Ems, Weser, Elbe, Oder, and Danube) and the drainage areas of North Sea and Baltic Sea (Schönbäck et al. 2003: 379).



Figure 23: German Water Sector Organisation. Source: Wikipedia (2007)

Germany accounts for a total area of 357.022 km<sup>2</sup> and a population of 82 million, which results in a rather high population density of approximately 230 people per km<sup>2</sup> (Schönbäck et al. 2003: 379). Average rainfall registered 768 mm. There is, however, a 30% difference between

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old (873 mm) and new (612 mm) federal states. Water demand is covered by 65% through ground water, the remainder being provided by surface (lake and dam) water (ibid: 381). The key performance indicators for the water supply and the sanitation sector are summarized in Table 19.

WATER SUPPLY		SANITATION			
Domestic Water Supply	5,4 bn m³/yr	Volume treated	10,5 bn m³/yr		
Potable Water Coverage	99%	Service Coverage	93%		
No. of WTPs	14.525	No. of WWTPs	6.000		
No. of Connections	37,7 mn	No. of Connections	39,6 mn		
Per capita Consumption	130 lpcd	Sewer Network	486.159 km		
Distribution Network	500.000 km	Treatment Type	1,1 % prim.		
Unaccounted-for water	8%		6,3 % sec. 83,1 % tert.		
Meter coverage	100%		6,8 % other		

Table 19: Key Performance Indicators (Germany). Based on data from GWI (2005: 110).

Based on federal and state laws, municipalities are free in choosing the organisational form of their water sector. Possible options are the municipal department (*Regiebetrieb*), the municipal utility (*Eigenbetrieb*), municipal companies (*Eigengesellschaft*), joint ventures (*Kooperationsmodell*), miscellaneous operator models (*Betreibermodell*) and management and service contracts (*Betriebsführungsmodell*) (Rudolph 2003: 97).

ORGANISATIONAL FORM	WATER SUPPLY	SANITATION
Municipal Department	< 1 %	11 %
Municipal Utility	17 %	43 %
Municipal Company	33 %	22 %
Special Purpose Associations	24 %	11 %
Cooperation Model	25 %	9 %
Other Private Companies	< 1 %	4 %

Table 20: Organisational Forms by Population (Germany). Based on data from Haneke and Schwarz (2005: 30-31).

Among the most active private operators are the French multinationals *Suez* and *Veolia*. Suez develops its business mainly via its subsidiary *Eurawasser* with contracts in Rostock, Cottbus, Schwerin, Goslar, Leuna and other areas in Eastern Germany. According to their own statement they provide water services for above 700.000 people in Germany. *Veolia Wasser's* current positioning has been dramatically influenced by its winning bid (together with RWE) for the 1999 privatization of *Berlin Wasser*, which has been the only transaction of that size and kind in Germany so far. Further activities include *OEWA* and *MIDEWA* with more than 150 contracts such as in Görlitz, Weißwasser, Braunschweig, Leipzig and Hannover. Other private companies include *Remondis*, *WTE*, *Severn Trent* and *RWE Aqua*. However, except for around 12%, the German water market appears to be still strongly in municipal hands. A detailed analysis of cost structure, accounting methods and finance was prepared by Schönbäck (Schönbäck et al. 2003: 394).

# 3.3.3 Institutional and Legal Framework

At the national state level the *Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit* (Federal Ministry for Environment, Nature Protection and Reactor Safety) has the main responsibility for the water sector, however, some other ministries have independent tasks in the field of water resources management (GWI 2005a: 98).



Figure 24: Institutional Framework in Germany.

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The ministry is assisted by several federal authorities, such as the *Umweltbundesamt* (federal environment agency) and the *Bundesamt für Naturschutz* (federal nature conservation agency). The national legal framework is the *Wasserhaushaltsgesetz* (federal water act 1957 amended in 1996), which provides the basis for the application of the separate water laws in each of Germany's 16 *Länder* (federal states). At federal state level ownership, monitoring and maintenance of waters and licensing for the use of water and indirect discharges is regulated by the *Landesregierung* (federal state government) (ibid). At the lowest level, municipalities have a considerable degree of freedom in implementing their water management policies. Within their jurisdiction, municipalities maintain smaller water authorities. Delegation of wastewater services to third parties, however, was only allowed as recently as in 1996 (Schönbäck et al. 2003: 383; Rudolph 2003: 94).

#### 3.3.3.1 Environmental Regulation

Drinking water quality is governed by the *Trinkwasserverordnung* (drinking water ordinance), which contains provisions for drinking water quality and limits on harmful substances. The *Grundwasserverordnung* (ground water ordinance) limits contamination of the ground water. Similar to the UK and France, modern environmental regulation in Germany is guided by the European Union directives (GWI 2005a: 108; Schönbäck et al. 2003: 382).

The *Abwasserverordnung* (wastewater ordinance) sets out the conditions to get a permit to release wastewater into water courses. Levies, charged for this release, however, are fixed in the *Abwasserabgabengesetz* (federal wastewater levy law). Further laws connected to environmental regulation issues are the washing and cleaning agents law, infection protection act, use of fertilisers ordinance, recycling and waste law, federal protection against emissions law, federal nature law and environmental audit law (ibid). Technological framework regulation comes from a host of organisations such as *ATV*, *DIN* and *DVGW*; standards which are, however, increasingly being adapted into European CEN standards (Rudolph 2003: 105).

#### 3.3.3.2 Economic Regulation

Principally there is no central economic water regulator in Germany such as in the UK. However, tariffs charged by the municipalities are watched over by supervisory authorities, which work on a federal state level. Some of them have become objects of criticism for rubber stamping tariffs without applying any efficiency criteria. Prices charged by private corporate structures are subject to supervision by the federal state cartel authorities, or – in case they operate in several states – by the federal cartel office (GWI 2005a: 106). Particularly active in price examination so far have been the states of Hesse and Baden-Württemberg (ibid: 107). Since municipalities are often the dominant shareholders, there is effectively self-regulation of prices (Lehman 2002: 105).

The German tariff system works on a full-cost recovery principle, however, average rates vary considerably from state to state. Among the federal states with the highest prices are the Eastern states of Thuringia and Saxony, and the Western state of Hesse (ibid: 111).

### 3.3.4 Experiences and Outcomes

#### 3.3.4.1 Efficiency

The strength of the German water sector lies in the obligatory multiinterest approach which includes the hearing of experts and all involved stakeholders and is considered to be a "democratic and constitutional consideration of various interests and viewpoints" (Rudolph 2003: 98). Efficiency in this sense is defined as the implementation of pertinent and sustainable solutions. The downside of this notion, however, is that the model is highly political and decision-making may require extended time periods.

Several authors have tried to model possible efficiency effects of a water market liberalisation. However, due to the very complex character of conditions to be taken into consideration, assumptions have to be made and no final recommendations can be given. What nevertheless becomes clear is that economies of scale are not fully capitalised due to the

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(politically, not economically motivated) highly fragmented nature of the German water sector (Sauer 2004: 308; Sauer 2005a: 369; Sauer 2005b: 225).

## 3.3.4.2 Price Development

Germany is particularly proud of its water sector's high technological and service level, but this is also reflected in the cost structure of the system, which based on the full-cost-recovery principle, contributes directly to the tariff level of the market. Comparing worldwide tariffs for water and sanitation services reveals that the prices charged in Germany are among the highest (if not the highest) in an international context (Lehman 2002: 109, Rudolph 2003: 109, Kuckshinrichs and Schlör 2005: 296).



Figure 25: International Tariff Comparison. Source: Lehman (2002: 109).

Characteristical are also the large regional disparities, ranging from 1,26 EUR/m<sup>3</sup> in Lower Saxony to 2,33 EUR/m<sup>3</sup> in Saxony in 2003 (GWI 2005a: 111). From 1992 to 2001 prices increased by 44% from an average of 1,18 EUR/m<sup>3</sup> to an average of 1,70 EUR/m<sup>3</sup>. The main reasons that are given for this trend are the required investments in the new federal states, the introduction and later increase of national fees, the amendment of the drinking water ordinance and the general reduction in water demand. The latter refers to the high fixed cost share in the water cost structure which, given a reduction in water demand, results in higher cost per m<sup>3</sup> (Schönbäck et al. 2003: 398).

# 3.3.4.3 Capital Expenditure

Table 20 summarizes the investments made in the German water sector throughout the 1990s. A total of 28 billion EUR was spent, of which the former eastern states account for 8 billion EUR. On average 61% of all capital expenditure is spent for rehabilitation works in the distribution network (Kuckshinrichs and Schlör 2005: 295; Schönbäck et al. 2003: 395).

Average Annual Capital Expenditure [bn EUR]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
West Germany	1,58	1,70	1,87	1,94	1,94	1,92	1,86	1,89	1,83	1,89	1,91
East Germany	0,78	0,87	0,89	0,68	0,71	0,79	0,75	0,72	0,68	0,64	0,58
Germany	2,36	2,51	2,77	2,62	2,64	2,71	2,61	2,61	2,51	2,53	2,49

Table 21: Average Annual Capital Expenditure in Germany (1990-2000). Based on data from Kuckshinrichs and Schlör (2005: 294).

It is assumed that in the next few years between 100 and 150 billion EUR will have to be invested in the German water systems, which would clearly exceed the current practice (ibid). Due to the full-cost-recovery principle, higher investment would require a considerable increase in the already very high tariffs (Schönbäck et al. 2003: 395).

# 3.3.4.4 Profits and Director's Remuneration

As in the French system – and contrary to the UK system – there are no requirements for the disclosure of the company's profits or its director's remunerations. This lack of transparency contributes directly to the weak public acceptance of PSP in many cases, since public awareness still believes that the companies are making high profits at the cost of service level and employees.

## 3.3.4.5 Environmental Aspects

German surface water quality has been improving considerably over the past two decades. Up to the end of the 1960s strong post-war growth of German industrial activities provoked an increasing contamination of rivers, until Germany started to intensively invest in the construction of treatment plants. As a result the emission of oxygen-consuming waste water contaminants was substantially reduced. During the 1990s Germany had to cope in addition with the environmental protection deficits of the

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former Eastern states, and within one decade impressively erected over 2000 sewage treatment plants and hundreds of kilometres of sewer pipes on ex-DDR territory. Today Germany is considered to be among the most advanced countries both in end-of-pipe water protection and prudent use of drinking water. (Rudolph 2003: 92, Schönbäck et al. 2003: 379).

## 3.3.4.6 Competition

Presently, competition in the German water sector takes place by means of bidding schemes, similar to the French system (competition for the field). During the 1990s electricity markets were liberalised and consequently also discussions for a wide-scale liberalisation of the water markets was triggered, which peaked out with the Ewers report in 2001. The water sector is particularly excluded from § 103 of the national competition act (*Gesetz gegen Wettbewerbsbeschränkungen*), which allows water companies to have local monopolies. The Ewers report, as an analysis of multidisciplinary experts, was aimed at examining possibilities to further competition in the market, such as e.g. common carriage. Due to the particularities of water compared with electricity, current policy is, however, not to be expected to follow this strategy (Lehman 2002: 108, Schönbäck et al. 2003: 384; Kuckshinrichs and Schlör 2005: 299). Presently liberalisation discussions have retreated to a rather academic discourse (Ölmann 2004: 53).

## 3.3.4.7 Consumer and Employee Satisfaction

Well aware of the current political situation, private operators are presently more than willing to maintain high degrees of service, since good reputation is conditio sine qua non to further develop their business in Germany. Consumer satisfaction can therefore be considered as relatively high, since standards are maintained or even improved compared to pre-PSP levels. Public control is to a large extent accomplished by the trade unions and comparable organisations (Geiler 2006: 138).

A similar scenario applies to employee interests. Due to political pressure most private operators are forced to maintain employee levels at the pre-privatization level at least for a period of a few years. However, natural fluctuation is not being replaced, so employment levels have been constantly decreasing throughout the last years (Schönbäck et al. 2003: 405).

# 3.3.4.8 Structural Changes

Besides private sector participation there has been a strong trend towards private organisation forms. The number of municipal companies has been increasing considerably at the cost of municipal departments and municipal utilities. Whereas in 1994 still 60% of the population was served by a Regiebetrieb, in 1997 this percentage had already fallen to 44%, mainly consisting of small municipalities. The trend towards private operators, however, has not been so substantial as expected by many authors in the early 1990s (Schönbäck et al. 2003: 393).

# 3.4 Selected further European Countries

# 3.4.1 Spain

Spain accounts for a total area of 504.782 km<sup>2</sup> and a population of 44,7 million, which results in a rather low population density of 89 people per km<sup>2</sup>. Average rainfall registers about 600 mm, however, one of the main water problems of Spain is the concentration of water richness in the north and partially severe scarcity in the southern provinces. Variations range from 2200 mm to 120 mm. Water demand is covered by 30% through ground water, the remainder being provided by surface water. Desalination is playing an ever increasing role in the provision of fresh water (Soler 2003: 214, GWI 2005a: 179). Hydrographically Spain is divided into 14 *cuencas hidrográficas* (river basins - Figure 26) with their own *confederaciones hidrográficas* (river basin authorities).



Figure 26: Spanish Water Sector Organisation. Source: Ministerio de Medio Ambiente (2005: 72).

The main institutions responsible for the regulation of the Spanish water sector are the *Ministerio de Medio Ambiente* (Ministry of Environment), the *Dirección General del Agua* (Water Directorate General), the *Consejo Nacional del Agua* (National Water Council) and the regional *Comunidades Autónomas* (Autonomous Communities). The regions have the constitutional right to develop their own water sector strategies, as

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well as legal frameworks within the basic guidelines given by the central authorities. The obligation to provide water services lies with the municipalities who may operate them directly themselves or contract them out to concessionaires (GWI 2005a: 174, Lehman 2002: 111).

WATER SUPPLY		SANITATION			
Domestic Water Supply	3,5 bn m³/yr	Volume treated	2,3 bn m³/yr		
Potable Water Coverage	87 - 97%	Service Coverage	55%		
No. of WTPs	n.a.	No. of WWTPs	1.326		
No. of Connections	n.a.	No. of Connections	n.a.		
Per capita Consumption	238 lpcd	Sewer Network	n.a.		
Distribution Network	n.a.	Treatment Type	mainly sec.		
Unaccounted-for water	25%		12,9% tert.		
Meter coverage	97%				

Table 22: Key Performance Indicators (Spain). Based on data from GWI (2005: 179).

The Spanish water market can be considered to be relatively mature with 32% of services provided by private companies, 12% by mixed private-public companies, 49% by publicly-owned companies and only 7% by municipalities themselves. The Spanish model is directly derived from the French one. Mayor players are *Agbar* (controlled by Suez), *Aqualia* (a subsidiary of FCC), *Canal de Isabel II* (a publicly-owned company serving the autonomous Madrid region), *Urbaser* (ACS - Dragados), *Aguas de Valencia* (SAUR) and *Ondagua* (RWE) (GWI 2005a: 176). The average concession time amounts to 25 years, ranging from 15 to 50 years. Tariffs are negotiated directly by the municipalities and for private users are based on cost-recovery. Agricultural users have subsidised tariffs.

The key drivers for the next years will be 1) the ongoing national water shortages and therefore the necessity to continue urgently with the Acuamed Desalination program, 2) the necessary improvements of the wastewater infrastructure and 3) compliance with EU regulation. As EU financing out of the cohesion fund will continually decrease, new sources of funding will have to be obtained (GWI 2005a: 183).
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# 3.4.2 Italy

Italy covers a total territory of 301.366 km<sup>2</sup> and has a population of 58 million, resulting in a population density of 192 people per km<sup>2</sup>. Average rainfall registers about 657 mm, with substantial regional variations from 380 mm in Sicily to 1520 mm in Udine. 65% of the country's rainfall occurs in the north of Italy. Water demand is covered by 86% through ground water, the remainder being provided by surface water. Only 1% comes from sea or brackish water. Characteristic for the Italian water sector are its 12.400 aqueducts covering a length of 170.000 km. Hydrographically Italy is divided into 6 mayor *bacini idrografici del fiume* (river basins - Figure 27) with their own local bodies safeguarding the local environment (GWI 2005a: 138).



Figure 27: Italian Water Sector Organisation. Source: ITSOS (2007).

Responsibility over water policy and execution is shared between a large number of institutional bodies, among them the *Ministero delle Infrastrutture e dei Trasporti* (Ministry of Public Works and Transport), the *Ministero per le Politiche Agricole, Alimentari e Forestali* (Ministry of Agricultural Policies and Forestry), the *Ministero dell'Ambiente* (Ministry of Environment), the *Comitato di Vigilanza sull'Uso delle Risorse Idriche* (Water Resources Commission) and the river basin authorities. The central law governing the current water sector regulation is the so-called Galli law, which came into force in 1994. It introduced the joint operation of water and waste water services and reorganised the sector by setting up 91 *ambiti territoriali ottimali* (ATO – optimal territorial areas) to replace the heavily fragmented structure with over 8.000 operators. (GWI 2005a: 137, Lehman 2002, 116).

WATER SUPPLY		SANITATION		
Domestic Water Supply	9,14 bn m³/yr	Volume treated	1,5 bn m³/yr	
Potable Water Coverage	96%	Service Coverage	88%	
No. of WTPs	2.000	No. of WWTPs	15.000	
No. of Connections	n.a.	No. of Connections	n.a.	
Per capita Consumption	278 lpcd	Sewer Network	92.000 km	
Distribution Network	176.000 km	Treatment Type	51 % prim.	
Unaccounted-for water	27%		46 % sec.	
Meter coverage	100%		7% tert.	

Table 23: Key Performance Indicators (Italy). Based on data from GWI (2005: 139).

The Galli law and related legislation arrange for the tendering of water operation within the ATO to a public-private company, the private partner being chosen by a competitive bidding procedure or to an inhouse – award directly to a municipality controlled company. Of the 91 ATOs up to now only 11 concessions have been chosen by tender, 46 were awarded directly and in 34 cases the operational form has yet to be decided. The Galli law introduced also cost-recovery into the tariff system, which traditionally had generated prices among the lowest in Europe (GWI 2005a: 138; Lehman 2002 116; Lobina and Hall 1999: 3).

Currently only 5-6% of the water market is in private hands. The involvement of the big international players is not very transparent; however, both *Veolia* and *Suez* have stakes in several local companies. Tenders are presently open for the ATOs of Agrigento, Catania, Catanzaro, Palermo, Messina, Siracusa and Trapani and have revealed as complex due to ongoing legal action in some cases (GWI 2007: 45)

## 3.4.3 The Netherlands

The Netherlands account for a total area of 41.500 km<sup>2</sup> (of which 7.700 have been artificially created through land reclamation) and a population of 16,3 million. The resulting population density of 381 people per km<sup>2</sup> is among the highest in Europe. Average rainfall registers about 775 mm and water demand is covered by 62,1% through ground water, the remainder being provided by surface water. Hydrographically the Netherlands are divided into 4 main *stromgebieden* (river basins), i.e. *Rijn, Maas, Schelde* and *Ems* (GWI 2005a: 152, Schönbäck et al. 2003: 419).



Figure 28: Dutch Water Sector Organisation. Source: VEWIN (2007).

The Dutch water sector is highly centralised and firmly in public hands. The *Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieu* (Ministry of Housing, Spatial Planning and Environment) and the *Ministerie van Verkeer en Waterstaat* (Ministry of Transport, Public Works and Water Management) have the government responsibilities for water supply and water management respectively, whereas the 12 provincial governments are responsible for groundwater management. All provinces have delegated their responsibilities to 36 *Waterschappen* (Water Boards), whose main task is to control water quantities and qualities and the operation of wastewater treatment plants. Their umbrella organisation is the *Unie van Waterschappen*. The sewerage network is managed by the municipalities, who own also most of the 17 *Waterbedrijfen* (drinking water companies), and whose central association is the *Vereniging van Waterbedrijven in Nederland* (Association of Dutch Water Companies). The *Rijkswaterstaat* is the national government agency responsible for sector supervision and strategic policy (GWI 2005a: 150; Schönbäck et al. 2003: 430).

WATER SUPPLY		SANITATION		
Domestic Water Supply	1,1 bn m³/yr	Volume treated	1,7 bn m³/yr	
Potable Water Coverage	100%	Service Coverage	99,5%	
No. of WTPs	224	No. of WWTPs	378	
No. of Connections	7,29 mn	No. of Connections	5,3 mn	
Per capita Consumption	126 lpcd	Sewer Network	86.000 km	
Distribution Network	112.000 km	Treatment Type	2,3 % prim.	
Unaccounted-for water	5%		19,6 % sec.	
Meter coverage	96%		78,1 % tert.	

Table 24: Key Performance Indicators (The Netherlands). Based on data from GWI (2005: 153).

Current legal framework legislation is the Drinking Water Act 2005 which stipulates the public ownership of water service companies in the Netherlands and leaves no room for extended privatisation discussions in the foreseeable future. The Dutch water sector stands out through its benchmarking system introduced in 1997, aiming at transparency and efficiency gains, but maintaining the public shareholder structure of the sector. Every year a financial assessment takes place and once every three years overall performance is measured. The parameters taken into account are the quality of drinking water, customer's polled service perception, environmental impact and tariff and cost development (Schmitz 2006: 14).

Private sector participation has so far only taken place via BOT schemes. Veolia reached financial closure for a large BOT contract for the Delfland sewage system for the city of The Hague in 2004 (GWI 2005a: 152). It is expected, however, that BOTs remain a rare occurrence and will be used only for larger and demanding projects (ibid: 157)

# 3.4.4 Austria

Austria covers a total territory of 83.858 km<sup>2</sup> and accounts for a population of 8,11 million people and population density of 99 people per km<sup>2</sup>. Average rainfall amounts to 1.170 mm and water demand is covered by 99% through ground and spring water. Hydrographically Austria belongs almost entirely to the Danube river basin, with small areas belonging to the Rhine and Elbe areas (Schönbäck et al. 2003: 9; GWI 2005a: 48).

WATER SUPPLY		SANITATION		
Domestic Water Supply	0,8 bn m³/yr	Volume treated	1,1 bn m³/yr	
Potable Water Coverage	87%	Service Coverage	86%	
No. of WTPs	6000	No. of WWTPs	1407	
No. of Connections	7,0 mn	No. of Connections	6,9 mn	
Per capita Consumption	150 lpcd	Sewer Network	n.a.	
Distribution Network	28.000 km	Treatment Type	75 % tert.	
Unaccounted-for water	90,5%	in catilitient Type		
Meter coverage	n.a.			

Table 25 Key Performance Indicators (Austria) (adapted from GWI 2005a: 51)

The Austrian water sector is firmly in hands of the public sector and there is strong resistance, particularly provoked by the trade unions and green and social democratic parties, to change in this respect (Lauber 2002; Lauber 2006; Schenner 2006). In the tradition of the Austrian federalist constitution responsibilities are decentralised and shared between central government (*Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft* - Federal Ministry of Agriculture, Forestry, Environment and Water Management), federal states and municipalities. The ultimate responsibility for water and sanitation services lies with the municipalities and its 5.200 water enterprises (Schönbäck et al. 2003: 13, GWI 2005a: 48).

Political privatisation discussions were triggered in the wake of the 1990s gas and electricity liberalisations and by a report issued by PricewaterhouseCoopers in 2001 (PwC 2001). However, besides some small scale BOTs and cooperation models implemented between 1996 and 2001 PSP has not gained momentum in the Austrian water sector so far.

# 4 EMPIRICAL SURVEY INTO EUROPEAN WATER SECTOR STAKEHOLDERS

The literature review of chapter 3 has shown the substantial variety of approaches to water sector organisation in Europe and the diversity of opinion attached to this plurality. In addition to this explorative analysis an empirical survey into the main sector stakeholders of the described countries has been carried out. Stakeholders in this context shall include public and private enterprises, authorities, academic faculty, consultants, donor organisations, NGOs and the news media. The experiences of people, who are in touch with the water sector on a day-to-day basis, should give valuable insights both in the strengths and shortcomings of the European systems, as well as a future outlook for developing countries, including the application potential of the franchising concept.

# 4.1 Methodology

The applied method for this empirical survey was the *expert interview* as a specific sub-group of qualitative social research methodology. This hermeneutic and interpretative approach is typically considered, when the level of information on a specific research question is too low to generate a theory. The main objective is to intensively and openly explore the relevant topic without restricting the interviewee with ex ante hypotheses. Any assumptions of the interviewer shall not limit the outcome of the analysis (Froschauer and Lueger 1992: 15). Induced by the relatively high time and resource requirements, smaller samples are accepted and statistical representativeness is replaced by an in-depth examination of the relevant phenomena (Baethge et al. 1995: 32).

*Experts* in this context are persons with particular knowledge about specific facts or data and *expert interviews* are a method to make accessible this knowledge (Gläser and Laudel 2006: 10). Basically three techniques of interrogation are possible, i.e. partially standardised or non-standardised interviews, observations and non-reactive techniques (Bortz and Döring 2002: 326). The method applied to the present survey belongs to the first group: it was a partially standardised written interview in the form of an

email questionnaire with open questions. The approach was to give a basic structure, but leave the questions as open as possible in order to allow the interviewee to provide his own perspectives, ideas and priorities. Although a personal, oral interview would fit better this philosophy, it was decided to use the email questionnaire to reach different stakeholders all over Europe. For reasons of time and available resources this demand would have gone far beyond the possible scope of personal interviews.

# 4.2 Empirical Design

The design of the questionnaire refers to three basic sections, which are, first, lessons learnt out of European PSP experiences, second, a future outlook for developing countries and finally, the application potential of the franchising concept, with 6, 5 and 4 open questions, respectively. A facsimile of the used questionnaire can be found in Annex 1. Language of the questionnaire was in all reviewed countries English and the wording of the questions was exactly the same in all interview contexts.

### QUESTIONNAIRE – INNOVATIVE PSP CONCEPTS

#### LESSONS LEARNT OUT OF EUROPEAN PSP EXPERIENCES

1. If you take a look at the wide range of PSP concepts applied to the European water sector: which one would you say has proven to be the most efficient one in the long run?

Please name the most important drivers for the success of the concept compared to other approaches. What are the indicators for success and how do you measure it?

3. What would you say are the three most important lessons learnt out of the European PSP experiences?

4. How do you explain the current worldwide negative publicity against water PSP?

- 5. What is your general experience with customer satisfaction under PSP schemes?
- 6. How would you judge overall employee satisfaction under PSP schemes?

#### FUTURE OUTLOOK FOR DEVELOPING COUNTRIES

- 7. Please express your opinion on the three most important trends in water PSP in developing countries for the next 10 years.
- 8. Please name the three biggest problems to solve in water PSP in the next years. Why?
- 9. What were the main reasons for the failure of past PSP projects in developing countries?
- 10. Which approaches do you consider to be the future successful PSP concepts for developing countries and for what reasons?
- 11. How can the experiences made in Europe be implemented into innovative PSP concepts?
- FRANCHISING AN INNOVATIVE OPTION?
- 12. Do you know the concept of Franchising O&M? a) Would you, in principle, accept a role as franchiser for your company? b) Would you, in principle, accept a role as franchisee for your company?
- 13. Would you consider it an efficient and innovative option to approach water problems in developing countries?
- 14. What would you consider the advantages and disadvantages of the concept?
- 15. Would you say it could be an efficient approach to lowering public resistance to water PSP? Why?

Table 26: Questionnaire - Innovative PSP Concepts.



Figure 29: Empirical Sample.

The questionnaire was sent out together with a cover letter to 247 organisations in Austria, France, Germany, Italy, the Netherlands, Spain, the UK and some worldwide active institutions (such as the U.N.). The contacted stakeholder groups included academic faculties, public authorities, public enterprises, private enterprises, consultants, NGOs, news media and donor organisations, and were selected, based on an extensive, mainly internet conducted, sector survey.

		Acad. Faculty	Public Author.	Private Enterpr.	Public Enterpr.	Consul- tants	NGO & News M.	Donor Organ.	[·	тот ·]	<b>`AL</b> [%]
Austria		3	3	6	6	1	3	2	2	24	10%
France		10	8	7	3	5	3	1	6.9	57	15%
German	у	8	5	14	12	10	1	2	5	2	21%
Italy		3	8	15	2	0	3	1	6.9	2	13%
Netherla	ands	4	6	1	6	5	3	1	2	26	11%
Spain		3	7	6	4	0	1	2	2	23	9%
UK		12	4	23	1	8	1	0	4	9	20%
World		0	0	0	0	0	1	3		4	2%
	1										
τοται	[-]	43	41	72	34	29	16	12	2	47	
TOTAL	[%]	17%	17%	29%	14%	12%	6%	5%			

Table 27: Empirical Sample.

The study took place from 01.01.2007 until 15.04.2007. The questionnaire was followed up by an email reminder, three weeks after the initial transmission and some interviewees were additionally

contacted by telephone. The interviewees in the chosen organisations were selected out of the following areas: senior level management, business development or corporate strategy and some selected experts from other areas. Recruiting took place mainly through the networks of the author and Prof. Rudolph, extended by further important European stakeholders, who were contacted directly and asked for their contribution.



Figure 30: Completed Questionnaires.

37 completed questionnaires were received, which equals a response rate of 14,98%. This figure is considered average in similar qualitative surveys. Whereas by stakeholder group, variation in response rates was not significant, country-wise the differences were considerable. The bias towards Austria and Germany has its reason in the networks applied for the recruitment, but the U.K. sticks out for its contribution.



Figure 31: Response Rates per Country and per Stakeholder Group.

# 4.3 Lessons learnt out of European Experiences

The general view on efficiency comparisons between the various European water sector approaches reveals a strong bias towards the home-country concept. Although most interviewees admit that a comparison is difficult and one can not identify one single most efficient model, the ones who finally do mention a country, always name their home country.

#### MAIN DRIVERS FOR SUCCESS

- Competition or regulation
- Clear contractual situation stipulating the obligations and duties of the parties
- Legal and institutional framework capable of addressing policy and other issues
- Stable and attractive economic and political environment
- Attractiveness to private finance (in particular the tariffs methodology)
- Active Risk management
- Efficiency incentives
- Long-term strategic and financial planning
- Professional O&M and holistic transfer of responsibilities to the private partner
- Transparent investment policy & sustainable infrastructure investment
- Investment targets have to be fixed as regards content, not only financially
- Needs of the public sector and of the customers have to be taken into account
- Balanced relation between private and public partners and all involved stakeholders
- "at arms length" subcontracting
- Management of public perception
- Track record of PSP in other sectors

### Table 28: Main Drivers for Success.

UK water management stands out primarily for its success in attracting private finance (at close to the interbank lending rate) and substantial investment in infrastructure. Although data on long-term outcome (such as investment in maintenance and rehabilitation) is still not available, it has provided a large degree of environmental protection, the improvement of managerial practices and the integration of consumers as active stakeholders. From an institutional point of view, both, economic and environmental regulation has led to a better accountability of the water companies and clear contracts between the public and the private sector. Key driver of success of the British model is the clear and stable regulatory approach, both for economic and environmental issues. The regulator has considerable power and credibility to challenge information from the industry, in order to offset asymmetric information regarding cost and methods.

The French model counts basically on its long-term experiences for the simple reason of having been around for the longest time. Shortcomings include mainly the problem of incomplete contracts. Key success drivers are particularly the long-term approach, allowing for longterm management and investment in the network infrastructure, and the relative independency from political changes.

INDICATORS FOR SUCCESS	MEASUREMENT
<ul> <li>Security and availability of supply</li> </ul>	<ul> <li>Interruptions and supply headroom</li> </ul>
<ul> <li>Water consumption</li> </ul>	<ul> <li>Ipcd</li> </ul>
<ul> <li>Use of water resources</li> </ul>	<ul> <li>Abstracted &amp; produced water (m<sup>3</sup>/a)</li> </ul>
<ul> <li>Quality of water</li> </ul>	<ul> <li>Level of non-conformity</li> </ul>
Cost	<ul> <li>EUR / m<sup>3</sup></li> </ul>
<ul> <li>Staff performance</li> </ul>	<ul> <li>Employees / 1000 connections, annual no. of training days, no. of working accidents</li> </ul>
<ul> <li>Investment</li> </ul>	<ul> <li>Investment / year</li> </ul>
<ul> <li>Reasonable profit for private partner</li> </ul>	<ul> <li>Profit / year</li> </ul>
<ul> <li>Trust balance between stakeholders</li> </ul>	<ul> <li>Public opinion regarding PSP, continuing investment in service with occasional disagreements with regulator</li> </ul>
<ul> <li>Serviceability / quality of service</li> </ul>	<ul> <li>No. of days with service restrictions, leakage, % of wastewater treated, etc.</li> </ul>
<ul> <li>Protection of environment</li> </ul>	<ul> <li>Level of non-conformity</li> </ul>
<ul> <li>Customer satisfaction</li> </ul>	<ul> <li>No. of customer complaints, no. of billing complaints, connection repair efficiency</li> </ul>
<ul> <li>Innovation</li> </ul>	■ N/A
<ul> <li>Efficiency</li> </ul>	■ N/A
<ul> <li>Operational performance</li> </ul>	<ul> <li>Non revenue water / system input volume</li> </ul>
<ul> <li>Ownership of assets clearly defined</li> </ul>	<ul> <li>N/A</li> </ul>
<ul> <li>Efficient risk allocation</li> </ul>	<ul> <li>N/A</li> </ul>
<ul> <li>Financial performance</li> </ul>	<ul> <li>Annual revenue, average water charges, etc.</li> </ul>

Table 29: Indicators and Measurement.

Considerable value is attributed to the cooperation model in combination with O&M contracts, as executed for example in Eastern Germany. The municipality has an important say in investment decisions and other issues of substantial importance. The private partner, on the other hand, has direct access to personnel, operations and technical processes. The balance of trust between all involved stakeholders seems to be highest under this approach.

#### LESSONS LEARNT OUT OF EUROPEAN WATER PSP EXPERIENCES

- PSP in water is possible.
- PSP, however, is not a panacea.
- There is still enormous mistrust between the public sector and private enterprises.
- Public acceptance is of utmost importance. You have to pick a model, which suits the local tradition of utility provision and is in sympathy with the prevailing political ethos.
- Political discourse is still more important than content orientation.
- Intense communication to the general public is of essential importance.
- Water utilities can in principle be efficiently managed both by public and private entities. Private companies, however, are a good way to foster investment, avoiding finance through the general taxation system and linking payment with usage.
- There has to be a clear, strong and sound regulatory framework, provided by the government and separate from service delivery and consumer interests. The economic regulator must be able to ensure best value for money & good performance.
- The agreement between public and private partners has to be very clear regarding responsibilities, framing conditions, and fee formula.
- The public sector is well advised to contract consultants in order to ensure a balanced contractual situation and align public, private and consumer interests.
- The public partners have learnt to identify and point out their needs and requirements, which have to be implemented in the design of the PSP.
- Tariffs are still a political issue; people are reluctant to pay for water despite its low cost and undeniable benefits.
- Water is a local good; hence solutions have to consider local particularities.
- There has to be a clear expectation of long-term planning either mandated in law, or required by the regulatory authorities. The running time of the contracts must be long enough (not < 15 years) to allow sustainable investment.</li>
- PSP requires optimized risk allocation to the partner who can manage them best.
- PSP project development takes time and patience. Good project preparation is the key.
- The models based on the framework available in Europe (legal, environment, urban, political) can't be copied one to one to other parts of the world, without modifications.
- Due to institutional requirements, the UK model is not applicable easily in an international context. The French concept has proven to be more flexible.
- NGOs mobilize against PSP emphasizing the enormous profits of private companies, consultants, banks and lawyers combined with poor service quality. Overall perception is, however, that they are not as significant opinion leaders as assumed in general.
- Customers and public partners always require the private partner to provide much higher service levels, than they demand from their public counterparts, even if it is not provided for in the contract.
- There is immense appetite in the financial markets for low risk, asset backed investments.
- It is essential to safeguard public values; stakeholder interests must be acknowledged and addressed.
- Water resources should be managed on a catchment basis rather than based on geographical or political boundaries.
- The bigger the project, the more difficulties.
- Very large quantities of capital are required in order to meet EU directives. Raising these amounts off the government balance sheet not only ensures efficiency in investment, but also reduces pressure on the public sector borrowing requirement.
- Tax Law Inequalities inhibit PSP.

Table 30: Lessons learnt out of European Water PSP Experiences.

Further mentioned PSP concepts include the Italian system after application of the Galli law, BO(O)T and DB(F)O approaches and "asset light" concepts, where the assets are not sold and the private partner steps into a O&M company and assumes management responsibility. The latter's driver of success is the better public acceptance, since assets remain public property. The contracting-out of service, operation and management contracts, both under private, not-for-profit private and public ownership, seems to be common and attractive.

NGOs and some of the interrogated public enterprises show a tendency to point out the efficiency regarding water quality and service coverage of utilities in public hands. Economic efficiency of PSPs (in the form of lower tariffs) is considered to be only a consequence of lower service quality. A high standing seems to have the combination of public ownership with private organisation forms.

In any case there is a broad consensus that there is not one best general concept, but the approach has to be developed after an in-depth analysis of the public side's requirements, taking into account a fit with local culture, economics, expectations and to some extent traditions. A basic question in this context is how to define efficiency (technical, economic, social or environmental efficiency?). Efficiency in a broader context seems to be not only related to cost, but to a wider set of benefits to the society with sustainable solutions.

Employee satisfaction is considered to be relatively high under PSP concepts (except for occasional efficiency savings in the form of headcount reductions at the beginning of PSP implementations). Job contents are potentially more motivating and remuneration is on average higher than in the public sector. Career opportunities and training programs are considerably better than under public administration. Interestingly, this is also admitted by NGOs and trade unions, who however question, if this situation would still prevail under oligopoly conditions. Particularly important to foster employee satisfaction seem to be transparent and performance related personnel development schemes. On a management level incentive bonuses and shorter decision structures are highlighted.

General judgements are nevertheless difficult, since comparisons depend substantially on the conditions prior to the implementation of PSP.

MAIN	REASONS FOR WORLDWIDE NEGATIVE PUBLICITY
•	Discourse remains political: Financial and foreign investors are easy targets. Often politicians prompt and encourage this negative publicity to push blame towards investors. (Whether deserved or not).
•	Typically after privatization, government subsidies are reduced or removed completely. This, partnered with historical underinvestment, results in increased near term capital investment, and therefore increases in necessary unsubsidized funding and increased tariffs.
•	In general people are reluctant to pay for water services, since they consider water to be rather a human right than an economic good. They make no difference between the service of "water supply" and the good "water" itself.
•	Lack of public trust that private companies give service quality the same priority as profitability.
•	Erroneous philosophical discourse against water PSP: also the provision of elementary foodstuff takes place under market conditions and nobody complains.
•	There seems to be dogmatic and selective view on poorly performing PSPs, blinding out successful PSPs and some considerably poorly performing public utilities.
•	Communicating and explaining PSP to the general public is difficult. The matter is complex and there are no mono-causal interrelationships. Successes in improving technical performance are not communicated sufficiently.
•	The reasons behind some failed PSP projects, particularly in Latin America, were not explained sufficiently to the general public. NGOs, however, used these projects in a very efficient way to make the topic even more "sensitive".
•	PSP is not a panacea: public expectations in general were too high.
•	Lack of high number of bidders, particularly for large projects, restricts competition.
•	Governments fear to lose power and control. Particularly the long-term nature of the contracts is rejected by politicians and leads to post-signing government interference.
•	Private partner generally has been more competent in contract management and post- negotiation often resulted in unbalanced contracts and discontent from the public side.

Table 31: Main Reasons for Worldwide Negative Publicity.

Customer satisfaction tends to be positive when the private partner is given targets, which are aligned with customer interests, and can vary considerably with the local situation. Clear regulation enhances satisfaction. In Europe there are customer committees, which control private performance and satisfaction is on average relatively high (which is not always the case in the rest of the world). Customer demands from private companies are substantially higher than those requested from public utilities. Problems arise if pre-privatization tariffs are heavily subsidized, leading to tremendous post-PSP rate hikes. Experiences in France have shown that many people don't even know their provider and that the only decisive facts are price and quality – regardless of ownership issues.

# 4.4 Future Outlook for Developing Countries

The outlook for developing countries seems a bit more complex and particularly the future element of the questions leaves extended room for assumptions and suppositions. On what all interviewees, however, agree, is a retrenchment in some of the key economies, such as Latin America, and continued or even growing interest in others, e.g. China, India, Middle East and North Africa. Due to the involved risk patterns, large-size players will be at an advantage and the circle of potential bidders will be rather small, producing restricted competition. Optimized risk allocation between the involved parties and the search for alternative finance concepts will be on the top of the agenda.

Ensuring increased access to clean drinking water and safe sanitation at affordable tariff rates, while at the same time government budgets to achieve the required investment levels are limited, seems to be the core problem to solve. A related issue will be the reduction of illegal connections and the population's education regarding water and hygiene awareness. Social tariffs for poor households (possibly subsidized) may be a way to cope with the millennium development goals.

Good sector governance and increased political stability to receive support from donors and development institutions will be essential and a base condition for the engagement of private investors. Two major problems to be tackled are corruption and legal certainty. Potentially there will be also a trend towards the cooperation model, giving more room to local governments to set their own priorities. Integration of local communities and stakeholders will be a crucial driver for success.

Although there will probably be no limitation to any specific concept, the trend will be more towards models where asset ownership and operations are split or where PSP takes only place at selected steps of the value chain and hence risk exposure is reduced. We will probably also see more local companies participating in PSP tenders. Partnership with locals will be of essential importance and hence capacity building will play an increasing role. A related aspect is that technological solutions will have to be sustainable to allow local staff to easily operate and maintain the infrastructure. This will be essentially true for small urbanisations and rural regions, for which new concepts will have to be developed. As regards finance concepts, local subnational approaches seem to be promising to overcome some of the problems of past developing country PSPs.

MAI	N PROBLEMS TO SOLVE IN DEVELOPING COUNTRY WATER PSPs
•	Affordability: Development of a cost-recovery tariff model, which allows the integration of the very poor parts of the community at an adequate service level.
•	Lack of water awareness and hence lack of willingness to pay for water services require education programs on a broad level.
•	Mistrust between public sector and private operators.
•	Missing public acceptance of PSP requires increased public relations and perception management.
•	Illegal connections have to be reduced.
•	Corruption and legal uncertainty continue to be considerably high.
•	Lack of political stability and post-contract government interference.
•	Local capacity building, both in local private partners and government institutions.
•	Creation of transparent, stable, fair and credible regulatory frameworks and institutions.
•	Power and chemical cost inflation.
•	Creation of new finance concepts involving local finance.
•	Incentivisation of contractual arrangements to effectively align public, private and consumer interests.
•	Decentralization and development of concepts for small urbanisations and rural areas.
•	Implementation of sustainable technologies to be operated and maintained by local staff.

Table 32: Main Problems to solve in Developing Country Water PSPs.

Failure of PSP in the past is attributed to various reasons which are basically also reflected in the main problems to solve over the next years described above. There is, however, a perception that real failure is rather rare. Contract termination does not mean necessarily failure, but can even prove to local governments that PSP is reversible in principle, if the political dogma changes.

Main problems, however, include political instability, corruption, legal uncertainty and a missing strong regulatory framework. The missing trust between the involved parties led to a lack of cooperation during project development and one-sided and unbalanced contracts, not taking into account all stakeholder requirements. Hard currency finance investing in soft currency assets with soft currency returns leads to major problems under unstable FX market conditions. The lack of information and of transparency at tendering stage leaves enormous room for postnegotiation, creating the public impression that private operators always bid low to secure the contract and consequently negotiate tremendous contract improvements.

Sometimes technological systems lacked sustainability, not taking into account the poor local possibilities concerning operation and maintenance staff. On the other hand the multinationals are not easily prepared to transfer know-how to locals. Due to the restricted possibility of cost-recovery urgently needed investment was not realized, partly also because of too short contract terms.

After all PSP is extremely negatively perceived by a wide range of especially poor socio-economic strata. The lack of education and related understanding of the PSP mechanisms made these people very vulnerable to opportunistic political propaganda by local governments and trade unions.

#### FUTURE SUCCESSFUL CONCEPTS FOR DEVELOPING COUNTRY WATER PSPs

- Increased stakeholder involvement to balance interest.
- Small-scale local solutions outside major urban centres.
- Local currency finance.
- Cost-recovery tariffs.
- Simple contracts, not relying on transparent and stable regulation.
- Increased know-how transfer, local capacity building and sustainable technologies.

Table 33: Future Successful Concepts for Developing Country Water PSPs.

There is a common understanding that the models developed in Europe are not applicable one-to-one in developing country contexts. The UK concept is rarely transferable, the French and German experiences, however, may be flexible enough to transfer some of the ideas to other continents and adapt them to local cultures. Important will be the assistance in improving local sector governance, the building of sound institutions and training of locals, both, in the public and the private sector. On a technical level there is potentially a lot of transferable knowhow, but the basic question is, for which return the global players will be prepared to give insights into their knowledge to locals.



# 4.5 Application Potential of the Franchising Concept

Figure 32: Awareness Level of the Franchising Concept.

The last part of the empirical survey was aimed at identifying the application potential of the franchising concept as an efficient and innovative option to approach water problems in developing countries. The awareness level of the concept seems still to be rather low, only 32% of the interviewees knew the model before receiving the questionnaire. In order to disseminate information on the concept, a paper explaining the principles of franchising was attached to the emails, hence awareness level should now be considerably higher than prior to the study.



Figure 33: Acceptance Level of the Franchising Concept (1/2).

As regards the acceptance level of the franchising model, most interviewees remain indifferent on the idea, stating that the concept is too new to take a decision on a possible integration into a strategic business portfolio. 24% of the sample, however, would potentially accept a role as a franchisor and 11% as a franchisee, subject to factors such as risk profiles, incentives and expected returns. A clear 'no', questioning necessity and benefits of the franchising concept, comes from the French multinationals.





There is a general opinion that the model seems to be innovative, but that many details to prove efficiency remain open and that the model is still at a very conceptual stage. There are fundamental doubts, whether local service providers can be found and consequently trained sufficiently to comply with the obligations of a potential franchisee. From a geographical point of view Latin America might be the most probable area of application. Several basic problems such as finance and cost-recovery are, however, not addressed. If the end user isn't prepared to pay for the water, also the franchising will face difficulties. An additional issue refers to the question, who will be responsible for securing water quality and complying with legal obligations.

Besides the advantages and inconveniences the concept might bring to developing countries, there arise serious concerns under which conditions and for which returns the global players would be prepared to implement such models. Their opinion is that they would need to deliver in-depth know-how, without having sufficient control over operations and without participating in potential successes. Finally, it would result in an equivalent to a consulting approach which is strictly rejected by them. There is a high risk of intellectual property right infringement and training of a potential future competitor.

ADVANTAGES	DISADVANTAGES
<ul> <li>Provides access to foreign knowledge and develops local knowledge base and expertise.</li> <li>Minimizes public opposition.</li> <li>Encourages foreign involvement through limiting foreign risk exposure to a potentially unfamiliar region.</li> </ul>	<ul> <li>Will there be an adequate return for the franchisor?</li> </ul>
	<ul> <li>How will franchisors be incentivised on delivering knowledge and training?</li> </ul>
	<ul> <li>Requires high level of local qualification and creates an interface risk between franchisor and franchisee.</li> </ul>
<ul> <li>Higher flexibility due to possible short-</li> </ul>	<ul> <li>Potential lack of transparency.</li> </ul>
term contracts. <ul> <li>Simple contract requirements.</li> <li>Integration of local companies knowing</li> </ul>	<ul> <li>Lack of intellectual property right protection: how can the franchisor avoid training a future competitor?</li> </ul>
<ul> <li>Integration of local companies knowing the local framework better than the multinationals.</li> </ul>	<ul> <li>Asset ownership and finance remain under public control.</li> </ul>
<ul> <li>Asset ownership and finance remain</li> </ul>	<ul> <li>Potential loss of economies of scale.</li> </ul>
under public control.	<ul> <li>Needs clear understanding on who is legally liable for the service quality.</li> </ul>
	<ul> <li>Increased controlling and monitoring cost for the franchisor and difficult and costly error correction.</li> </ul>

Table 34: Advantages and Disadvantages of the Franchising Concept.

It's a further moot point, whether franchising can lower public resistance: As in McDonalds, the franchising prototype par excellence, the principle of franchising consists in that the client believes it is all the same company. In that case there would be no change in public acceptance levels. If, on the other hand, the local company doesn't run under the brand of the international and with the international guaranteeing for the quality, the concept shouldn't be called franchising, but would rather resemble a consulting contract. The main question for public acceptance would probably be, if local service providers can provide the desired service quality at affordable prices.

However, it is a local solution, fostering local entrepreneurship and capacity building and could, hence, also be successful and accepted under the international's brand name (as it is the case in many other industries). Ownership of the utilities remains in public hands and confidence might increase due to a more balanced contractual setup, involving the public administration, local companies and international players.

# 5 INNOVATIVE PSP APPROACHES TO EMERGING ECONOMIES – A PERUVIAN CASE STUDY

Whereas European PSP experiences are legion and the old continent can look back on decades of water sector management, the franchising concept has so far been banned to theoretical existence. Although, the Institute for Environmental Engineering and Management is currently implementing a first pilot project in South Africa, empirical evidence on the advantages and shortcomings of the model remain low at the time of writing this diploma thesis.

Coming back to the research questions of this thesis, the main focus was to explore and analyse the long-term experiences of the European water sector, draw conclusions for water approaches to developing countries and synthesise these facts in an evaluation of the application potential of the franchising model, based on a case study of Peru. Chapter 5 will hence first, analyse and illustrate the Peruvian water sector, elaborate on its historical context and give an overview on sector organisation and legal and institutional framework and, second, try to identify upcoming Peruvian PSP developments and propose applications for the franchising concept. By doing so, facts from chapters 3 and 4 will serve as guide to integrate the European experiences into new models for the developing world. Chapter 5, therefore, is considered to be the synthesis of the foregoing explorative elaborations.

The choice of Peru as object of the case study has to be attributed to the following facts: First, Peru belongs, with an HDI of 0,767, to the medium development category and possibly has sufficiently educated human capital necessary for the applicability of the concept. Furthermore, water scarcity in many regions is severe and innovative approaches to tackle these problems are urgently needed. In addition, the Peruvian water sector has considerable similarities with the German one, opening a possible transfer of German notions (Rudolph 2000: 3). Although there have been numerous attempts to open the water sector to private sector participation, for several reasons most of the approaches failed, so far.

# 5.1 Peru Key Facts

Peru, once the centre of the legendary Inca Empire, was the last of Spain's Latin American colonies to become independent in 1824. Since then, Peru has been beset by political and economic instability resembling a story

"all too typical of Latin American countries – a rich natural resource base and abundant economic potential, squandered through decades of corruption, economic mismanagement and social conflict" (Datamonitor 2006: 4).

In recent years there have been signs of improvement, the administration got to grips with hyperinflation and the Maoist guerrilla insurgency and the competently administered election process in 2006 proved that Peru had evolved to be a mature democracy. Nevertheless, the economy remains vulnerable to external shocks, mainly due to its high dependence on the export of commodities such as copper and coffee. An additional cause for concern is the high level of external debt (ibid).



Figure 35: Peru - Political Map. Source: Bibliographisches Institut & F.A. Brockhaus AG (2005).

Peru, with its capital Lima, is located in western South America, bordering the South Pacific Ocean, between Chile and Ecuador. Official languages include Spanish (which is the mother tongue of around 70% of the population), Quechua and Aymara. About 45% of the population is Amerindian, 37% mestizo, 15% white and 3% black, Asian or other. Religion is dominated by the Catholic with 81% of the population, the remainder being divided among a wide range of small local religious communities (ibid).

PERU – KEY FACTS			
Capital City:	Lima	GDP (2005):	65 bn USD
Government Type:	Presidential Republic	GDP per capita (2005):	2.324 USD
Head of State:	President Alan García Pérez	real GDP growth (2005):	6,2%
Head of Government:	Prime Minister Jorge del Castillo	real GDP growth (annual average 2000-2005):	4,0%
Area:	1.285.220 km <sup>2</sup>	real GDP forecast (2010):	87 bn USD
Population (2005):	27.968.000	HDI:	0,767
Population Density:	22 / km²	CPI Inflation (2005):	0,8 %
Fertility Rate (2005):	2,56 %	CPI Inflation (annual average 2000-2005):	2,3 %
Fertility Rate (annual average 1995-2000):	2,88 %	Currency:	Nuevo Sol (PEN)
Unemployment Rate (2005):	12,5 %	Exchange Rate PEN-USD (2005):	0,303
Unemployment Rate (ann. av. 2000-2005):	9,9 %	Exchange Rate PEN-USD (ann. av. 1997-2005):	0,306

Table 35: Peru – Key Facts. Based on data from Datamonitor (2006: 12-28).

Popular support for President Alan García is expected to continue to be comfortably high. He has the backing of the country's business sector and will continue to implement the investor-friendly policies of the past decade. With record-high mineral prices he is fortunate to have sufficient room for manoeuvre to promote poverty-reduction policies by boosting public spending, primarily through investment in basic infrastructure such as the water supply network. Observers expect García to follow a pro-market economic policy focused on fiscal stability (EIU 2007: 1).

## 5.2 The Peruvian Water Sector – A Historical Review

The current institutional framework of the Peruvian water sector has evolved over more than half a century of continuous reorganization and structural changes towards focusing alternately on centralization and decentralization within the sector.

Although up to the beginning of the 1960s the responsibility to render water supply and sanitation services had been highly fragmented and firmly in municipal hands, a first centralization wave took place in the same decade, when the control of the urban sector was transferred to the *Ministerio de Vivienda* (Ministry of Housing). Administration of the rural sector was assumed by the *Ministerio de Salud Pública* (Ministry of Public Health) and its *Dirección de Saneamiento Básico Rural* (DISBAR - Directorate of Basic Rural Sanitation). All assets were transferred to the *Juntas Administradoras* (OMS/OPS 2000: 1).

The 1970s, coined by the reforms of the *Military Revolutionary Government*, gave rise to a dualistic sector structure. Big cities such as Lima (ESAL), Arequipa (ESAR) and Trujillo (ESAT) founded *empresas públicas* (public enterprises) to take over the sanitation services, while in the remaining cities services were rendered by the *Dirección General de Obras Sanitarias* (DGOS – Directorate General of Sanitary Works) under the supervision of the *Ministerio de Vivienda y Construcción* (MVC - Ministry of Housing and Construction) (PIDHDD 2006: 1).

In 1981 the government of Fernando Belaúnde Terry merged the three sanitation companies of Lima, Arequipa and Trujillo with the DGOS to form one state level company, the *Servicio Nacional de Abastecimiento de Agua Potable y Alcantarillado* (SENAPA – National Service of Water Supply and Sanitation). They organized SENAPA in 15 subsidiary companies and 10 operative distribution units, with SEDAPAL in Lima being the largest entity. However, around 200 cities (representing about 20% of Peru's population) were not integrated into the system and maintained their own services. The rural sector continued to be under the superintendency of the Ministry of Public Health. At the end of Terry's administration period legislation to eliminate the DISBAR and transfer its responsibilities to the

regional governments was initiated, but due to the change in government in 1985 (Alan García assumed power) never completed (ibid). With the beginning of the 1990s decentralization tendencies again gained momentum and in May 1990 one of the last acts of the government of Alan García was to decide on the transfer of all entities under the umbrella of SENAPA (except for SEDAPAL) back to the municipalities (ibid: 2).

Alberto Fujimori, president from 1990 to 2000 and, as dominant political figure throughout the 1990s, a free-market champion, triggered a comprehensive legal and institutional reorganization of the Peruvian water sector, with the ultimate aim of commercializing and privatizing the until then state-owned utilities. Particularly, Lima's water and sewerage system was in a state of near collapse in 1990, and Fujimori recognized the need for private investment to overcome the severe water crisis (Alcázar et al. 2000: 1). Important neoliberal laws (backed especially by the Worldbank) to enable institutional change were passed in 1991 (Ley de la Promoción de la Inversión Privada en el Campo de Saneamiento) and 1994 (Ley General de Servicios de Saneamiento). In 1992 the Programa Nacional de Agua Potable y Alcantarillado (PRONAP - National Potable Water and Sanitation Program) was initiated and SENAPA and SEDAPAL were transferred to the Ministerio de la Presidencia (Ministry of the Presidency). The 1994 law assigned all main powers in the sector to the Presidency and defined the corporate form of Entidad Prestadora de Servicios (EPS - Service Entity) as the consequent organization form of the urban water and sanitation municipal companies. In addition the law allowed for the foundation of a regulatory body, the Superintendencia Nacional de Servicios de Saneamiento (SUNASS - National Superintendency of Sanitation Services) (ibid).

In parallel there was an intent to reform tariff structures, which were now under the responsibility of SUNASS, in order to make the EPSs financially viable. The effect was, however, counterproductive, with the tariffs decreasing from USD 0,82/m<sup>3</sup> in 1996 to USD 0,56/m<sup>3</sup> in 1999. Although a host of international consortia including Suez, Veolia, Thames Water, Canal Isabel II and others formed up particularly for the SEDAPAL privatization (Reuters News 1994a: 1; Reuters News 1994b: 1; Reuters

News 1994c: 1; Reuters News 1994d: 1), the Fujimori administration decided to postpone the program (LatinFinance 1996: 3), which provoked heavy criticism by the involved bidders, who had each allegedly spent above USD 1mn in preparing their bids, making one observer speak even of a "three-year soap opera" (Crossborder Monitor 1997: 1). In the end they cancelled their attempts to privatize the water utilities completely and all entities remained in the public sector at the end of Fujimori's mandate in 2000 (PIDHDD 2006: 3). Officially, this step was justified by government capital expenditure programs to improve the water infrastructure (Water & Environment International 1999: 1) as well as several analyses that efficiency of the state-run companies had improved throughout the 1990s. Most probably, however, it was a populist move, provoked by growing public resentment against PSP (Lagniappe Letter 1997: 1). Due to the geographical situation (with its severe water scarcity) combined with years of missing investment, marginal cost for a private partner would have been so high that the resulting sharp and sudden price increases (the government had subsidized the tariffs for years) wouldn't have been politically executable (Alcázar et al. 2000: 44).

RIO CHILLON PR	RIO CHILLON PROJECT			
Size:	USD 80mn			
Location:	Lima			
Description:	BOT water project for the northern half of Lima, involving treatment and distribution improvements			
Sponsors:	Acea (45%), Impregilo (45%) and Cosapi (10%)			
Debt:	3 trances of 12-years bonds, of USD 10mn, USD 15mn and USD 9mn			
Bookrunner:	Citigroup			
Lawyers to the Bookrunner:	Estudio Muhe			
Lawyers to the Borrower:	Estudio Rodrigo, Elías & Medrano (Peru), Estudio Legale Chiomenti (Italy)			

Table 36: Key Facts of the Rio Chillon Project. Based on data from ProjectFinance (2002: 36).

The beginning of the new millennium with the newly elected Alejandro Toledo administration in charge saw new attempts of private sector participation in the form of BOT contracts. In April 2000 a 27-year contract was signed for the construction and operation of the Lima based Rio Chillon plant by the Agua Azul consortium of Italian companies Acea Spa., Impregilo Spa., Fisia Italimpianti, Castalia and local construction company Cosapi (Reuters News 2000: 1; Business News Americas 2002: 1). Finance for the USD 80mn investment was raised issuing three local 12-year fixed rate bonds, making it a landmark project for the Peruvian capital markets (ProjectFinance 2001: 11; Project Finance 2002: 36, LatinFinance 2005: 1). The plant supplies 44 milion m<sup>3</sup>/year on a take-orpay basis to SEDAPAL to service 740.000 inhabitants in the districts of Comas, Carabayllo, Puente Piedra, Santa Rosa, Ventanilla and Acon in the City of Lima (Lehman 2002: 191).

In 2002 Toledo established the *Ministerio de Vivienda, Construcción y Saneamiento* (Ministry of Housing, Construction and Sanitation) and made it the main executive power in the water sector. In the same year the government furthermore managed to secure finance from the Worldbank and the Inter-American Development Bank (Latin Trade 2002: 14). Water law amendments were presented to the Peruvian Congress in early 2003 (WMRC Daily Analysis 2003: 1).

Backed by the Worldbank in 2004 the *Proyecto Nacional de Agua y Saneamiento Rural* (PRONASAR – National Rural Water and Sanitation Project) was launched in order to promote sector development in rural areas and small scale towns and villages. The origins of this attempt to improve the water situation in the most severely regions of Peru can be attributed to PROPILAS (*Proyecto Piloto de Agua Potable Rural y Salud Comunitaria en Cajamarca*), a pilot project started by CARE in 1999 and supervised by the *Dirección General de Salud Ambiental* (DIGESA – Directorate General of Ambient Health) of the Ministry of Health. The main focus of PRONASAR is to find water supply and sanitation models which allow for sustainable operation and maintenance of the infrastructure (PROPILAS 2002: 9; MVCS 2003: 5).

Substantially high investment needs remained on the top of the agenda also over the last 5 years. According to a 2004 statement of water

regulator SUNASS, Peru's water sector would need investment of about USD 3,8 bn (Latin America News Digest 2004: 1). ADEPSEP, the association of public service private companies, even estimates the figure to be USD 4,2 bn (El Comercio 2004: 1). The *Plan Nacional de Saneamiento 2006-2015 "Agua es Vida"*, published by the ministry in 2006, is a comprehensive and integral attempt to propose a road map for sector improvement within one decade, embedded in a broader campaign to reduce poverty in the country and comply with the Millennium Development Goals (MDG). Investment requirements are estimated USD 4,0bn (MVCS 2006a: 56).

PLAN	NACIONAL DE SANEAMIENTO - CRITICAL ISSUES			
•	Insufficient service coverage, both in water supply and sanitation			
•	Insufficient sewage treatment capacity			
•	Poor service quality, resulting in high health risks			
•	Deficient infrastructure sustainability			
•	Tariffs do not allow for the recovery of investment and O&M cost			
•	Market size assigned to the individual operators do allows neither for economies of scale nor for financial viability			
•	Institutional and financial weakness			
•	Excessive, but poorly qualified workforce with high fluctuation rate			
Ta	Table 37: Plan Nacional de Saneamiento - Critical Issues.			

Based on data from MVCS (2006a: 25).

Lack of public financial resources to cope with these requirements brought PSP back to the political arena; this time, however, the approach (managed by the newly established PROINVERSION) was via concession models (El Comercio 2005: 1), which were supposed to provoke less resistance from the general public (EIU ViewsWire 2006: 1). Up to now only one concession contract has been signed for the city of Tumbes, where a soft loan from the German government (channelled via KfW) was used as subsidy in order to prevent steep rises in charges. The contract was awarded to Argentine-led consortium Latin Aguas (The Economist 2006: 56; GWI 2005b: 20; GWI 2005c: 45). Other projects included concessions for the regions of Piura (consequently extended to Paita) and Huancayo, both of which were suspended on Alan Garcia taking office as new Peruvian president in July 2006 (GWI 2006b: 19).

For SEDAPAL a complicated and exhaustive rate negotiation process with SUNNASS started in 2003. After long-lasting discussions, in 2005 the Lima water operator finally proposed three alternative business plans with rate hikes of 32%, 41% and 52% (Business News Americas 2005a: 1), but met resistance from the regulator and user groups (Business News Americas 2005b: 1). On request of SUNASS, in December 2005 SEDAPAL submitted a proposal including all necessary investment (estimated to be USD 1,3bn) to be covered by rate increases during the first 5 years. SEDAPAL proposed a 137% hike, which eventually led to an impasse situation, with both entities accusing the other of being responsible for the negotiation process to have stopped and making SEDAPAL one of the core topics of 2006 Presidential elections (Business News Americas 2006: 1, GWI 2006c: 10). After heavy criticism SUNASS had to finally withdraw its master plan at the start of 2006 and a decision on long term investment was postponed until after the elections. An agreement was finally achieved in July 2006 including a 16% tariff increase allowing for only USD 30mn in investment over the next 5 years, which at large will be sufficient to prevent the infrastructure from crumbling further (GWI 2006d: 22).

Alan Garcías success in having been elected as new president stems in no small measure from his promise to solve the country's critical water problems. One of his fundamental campaign slogans was *Agua para todos* (water for everyone), but being in office now he has to face the problematic situation that many customers are against water PSP and tariff increases appear politically difficult to handle (GWI 2006b: 19). His first success in this issue he scored, when in November 2006 a USD 600mn investment plan for SEDAPAL was approved by SUNASS. The finance for this plan will come only partly from tariff hikes (mainly industrial rates), with most of the money coming from development banks, government loans and the private sector. Main projects include the Marca II tunnel to bring snowmelt from the Andes to Lima, Huachipa, Taboada and La Chira WTPs and the overhaul of the distribution network (GWI 2006d: 22).

## 5.3 Water Sector Organisation

Peru's water reserves (which are 5% (!) of the planet's fresh water reserves) are abundant, but 95% of the population live in areas where water is expensive and scarce. The Peruvian territory is divided longitudinally by the Andes and the snowmelt flows towards the Atlantic Ocean, turning the Amazon region into a swamp and leaving the Pacific coast, where most of Peru's inhabitants leave, a desert-like, arid strip of land. Around 57% of the coastal farmland has irrigation systems, with the rest relying only on scarce rainfall of annually 48 mm (Lama 2002: 1). Despite its development in other utility areas such as electricity, telephone and even internet access, only slightly more than half of the population is connected to sewage facilities (Webber 2005: 1).

WATER SUPPLY		SANITATION		
Domestic Water Supply	3,0 bn m³/yr	Volume treated	0,5 bn m³/yr	
Potable Water Coverage	76 %	Service Coverage	57%	
No. of WTPs	N.A.	No. of WWTPs	N.A.	
No. of Connections	2,8 mn	No. of Connections	2,3 mn	
Per capita Consumption	291 lpcd	Sewer Network	N.A.	
Distribution Network	N.A.	Treatment Type	78% none	
Unaccounted-for water	44%		22% prim. & sec.	
Meter coverage	54%			

Table 38: Key Performance Indicators (Peru). Based on data from MVCS (2006a: 36-42).

Presently water supply and sanitation services in Peru are rendered by 49 EPS (among them SEDAPAL, which has the responsibility for 29% of Peru's total population), 490 municipality departments and around 11.800 community organizations, called *Juntas Administradoras de Servicios de Saneamiento* (JASS) (SUNASS 2006a: 1).

### 5.3.1 The Urban Water Sector

The EPS, as the main urban water service providers, render services to 89,6% of the urban population, half of which is served by operator SEDAPAL to Lima and the province of Callao. The remainder of the population is supplied directly by municipality departments or buys

water from mobile water vendors. Based on the number of connections, EPS are categorized into small, medium and large size EPS. Except for SEDAPAL, which is under central government control and Tumbes, which is currently operating under a concession contract, all other EPS are municipality owned and operated enterprises (ibid).

ORGANISATION	NO. OF CONNECTIONS	NO. OF EPS	SERVED POPULATION	
SEDAPAL	1.100.000	1	7,975mn (29%)	
Large EPS	40.000 - 200.000	9	5,444mn (20%)	
Medium EPS	10.000 - 40.000	20	3,004mn (11%)	
Small EPS	mall EPS 1.000 – 10.000		0,705mn (3%)	
		49	17,166mn (62%)	

Table 39: Empresas Públicas de Servicio (EPS).

Based on data from SUNASS (2006a: 14) and MVCS (2006a: 36).

SEDAPAL accounts for 43% of the total of 2,6bn potable water connections, followed by large EPS with 34%, medium EPS with 19% and small EPS with 4%. Potable water coverage amounts to an average of 84%, ranging from 34,5% in Marañón to 100% in Ilo. The 2,3bn sewage connections for the same areas are by 46% under SEDAPAL responsibility, 34% being administered by large EPS, 17% by medium EPS and 3% by small EPS. Average service coverage amounts to 75,3%, ranging from 92,9% in Tacna to 0,02% (!) in Pasco (SUNASS 2006a: 3-12).



Figure 36: Service Coverage in EPS administered Districts. Based on data from SUNASS (2006b: 1).



Figure 37: Continuity and Percentage of Wastewater Treatment. Based on data from SUNASS (2006b: 1

Service continuity, not being an issue in Europe, but vital in many developing countries, is at an average of 18,1 hours/day, ranging from 1 hour in Virgen del Guadalupe del Sur to 24 hours in Amazonas. Although still comparatively low, there has been made substantial improvement in this field over the last ten years, raising the figure from only 12,9 hours/day in 1998. Unaccounted-for water amounts to 43,9%, with a maximum of 77,3% in Barranca. Although sewage treatment coverage has doubled since 1997, only 24% of the collected waste water is subject to any kind of treatment (SUNASS 2006a: 3-12).



Figure 38: UAF Water and Production per Capita. Based on data from SUNASS (2006b: 2).

As regards disinfection level of drinking water the situation has improved considerably at the beginning of the new millennium. The percentage of samples containing residual chlorine above 0,5 mg/l has been steady around 98% over the last five years. Meter coverage was extended particularly in the second half of the 1990s (ibid).



Figure 39: Disinfection Level of Drinking Water and Meter Coverage. Based on data from SUNASS (2006b: 2).

Important players in the Latin American urban water supply sector continue to be *Proveedores Independientes de Agua Potable* (PIAP – Independent Potable Water Providers), who supply water by means of tank trucks, private condominium networks or community small-scale networks. In Lima it is estimated that 26-30% of the population is served by PIAPs, the same figures for Ica and Cuzco are 10% and 30%, respectively. A substantial problem is that price per m<sup>3</sup> is considerably higher (in Lima USD 2,40 per m<sup>3</sup>, i.e. 8 (!) times the tariff of tap water) and hence the percentage of household income of many of the poorest families to be attributed to water services is extremely high (Solo 2003: 11).

# 5.3.2 The Rural Water Sector

According to the Ministerio de Vivienda, Construcción y Saneamiento rural population centres are defined as villages of up to 2000 inhabitants. Applying this rule leads to a rural population of approximately 8,9mn, accounting for 35% of the totality of Peruvian inhabitants and 1,8mn households, almost all of them living under poor economic conditions. According to the same source, 38% of these inhabitants do not have access to potable water services; the corresponding figure for sewage services is even 70% (Cockburn 2004: 7).

It is estimated that only 20% of investment into water infrastructure was channelled towards the rural sector during the 1990s, which resulted in the situation that today the rural parts of Peru are far behind in service coverage compared with the urban centres of the country (OPS 2001: 10). In addition to the low levels of service coverage a 2003 study of the MVCS showed that also the existing infrastructure does not perform at a desirable level and is even non-operative in many cases (Table 40). Main reasons for this poor state are inappropriate administration and lack of financial resources for operation, maintenance and rehabilitation. Additionally, most of the investment made in the 1990s was not sustainable and with limited participation of the local communities. The result is that water availability is reduced to 1-2 hours per day, health risks are considerably high and the willingness to pay for this 'service' is virtually non-existing (ibid: 8-9). It is estimated that around 59% of the existing 11.800 rural water systems do not have installed any type of disinfection equipment (MVCS 2006a: 40). A comprehensive overview on the state of rural water systems can be found in MVCS (2003).

STATE OF INFRASTRUCTURE	GOOD	REGULAR	BAD	NOT OPERATIVE
Coastal Areas	-	90,0%	-	10,0%
Rainforest	41,7%	8,3%	16,7%	33,3%
Mountains	43,2%	47,7%	9,1%	-
AVERAGE	36,4%	47,0%	9,0%	7,6%

Table 40: Rural Infrastructure State. Based on data from Cockburn (2004: 9).

Responsibility for the provision of water supply and sanitation services in the rural sector is organized on a municipality level and lies with the *Juntas Administradoras de Servicios de Saneamiento* (JASS – Administrative Boards of Sanitation Services), which are also subject to SUNASS regulation. The JASS are constituted as civil associations as per the Peruvian civil law (PIDHDD 2006: 3-4). The paradigm change from a supply-oriented approach to a demand-led concept at the beginning of the new millennium has given momentum to new initiatives: in particular PRONASAR, aimed at improving the situation of the rural water sector. PRONASAR's executive organisation is the *Fondo Nacional de Compensación para el Desarrollo Social* (FONCODES – National Fund for Social Development Compensation), whose main objective is to finance, promote, supervise and evaluate projects, which are consequently contracted out to *Operadores Técnicos Sociales* (OTS – Social Technical Operators), normally ONGs working in the water sector such as CARE, CARITAS, PRISMA-AT, ECOCIUDAD, CEDEPAS, CENCA, OACA, SER, DESCO and others and *Operadores Supervisores* (OS – Supervision Operators), normally ONGs like SER or PRISMA-AT and engineering consultants. Finance comes from IBRD, the Canadian government and the Peruvian central government (Cockburn 2004: 15-16).

PRONASAR's predecessor was PROPILAS, a pilot project carried out by CARE and aimed at evaluating possible models of finance and project execution for rural communities under the premises of demand orientation and community participation. Two models were subject to detailed analysis, namely the *Modelo Municipal* and the *Modelo Comunal*, the main difference being that under the first variety, the municipality itself is responsible for selecting and contracting companies and ONGs, with JASS only being a consultant body. Under the latter model, the JASS themselves are in charge of contracting out the services, with the municipalities giving only technical advice (PROPILAS 2002: 21).



Figure 40: PROPILAS Models. Adapted from PROPILAS (2002: 21).



Figure 41: PRONASAR Institutional Scheme. Adapted from PRONASAR (2006a: 17).

Between the years 2002 and 2005 the approach was further developed by PROPILAS II. Currently PRONASAR includes four components: *rural water supply and sanitation* (component 1), *water supply and sanitation for small towns* (component 2), *capacity building* (component 3) and *program administration* (component 4). Main focus of PRONASAR, however, lies on concept 1, hence, the enforcement of the rural water and sanitation sector, with increased capacity building in the communities (PRONASAR 2006b: 9).



Figure 42: PRONASAR Execution Scheme. Adapted from PRONASAR (2006a: 33).
Other important rural projects include CARE's and WSP's REHASER program which intents to rehabilitate rural water and sanitation systems by means of micro credits (PAS 2005: 8) or the Small Town Pilot Project (STPP) implemented by MVCS, the Canadian International Development Agency (CIDA) and the WSP, following a Small-Scale Local Service Provider approach (McGregor 2005: 1). Under the latter model water and sanitation services are delivered by local operators, which may be private, public or mixed entities (ibid: 4).

## 5.4 Legal and Institutional Framework



Figure 43: Institutional Framework in Peru.

At a national level the overall responsibility for the water sector (i.e. the *ente rector*) lies with the *Ministerio de Vivienda, Construcción y Saneamiento* (MVCS - Ministry of Housing, Construction and Sanitation), mainly exercised through its *Viceministerio de Construcción y Saneamiento* (VMCS - Vice ministry of Construction and Sanitation) and the *Dirección Nacional de Saneamiento* (DNS - National Directorate of Sanitation). Their mandate includes overall sector policy-making, investment policies and

the assignation of resources. On a regional level the MVCS is represented by the *Direcciones Regionales de Vivienda, Construcción y Saneamiento* (DRVCS – Regional Directorates of Housing, Construction and Sanitation), which have a particular say in the selection of investment programs for the several regions. The responsibility for standard and norm setting is shared with the *Dirección General de Salud Ambiental* (DIGESA – General Directorate of Ambient Health), a department of the *Ministerio de Salud* (MINSA – Ministry of Health) (MVCS 2006a: 33).

DIGESA is the responsible authority to norm, supervise, evaluate and authorise the disposal of waste water and to approve sewage treatment projects. On a regional level they are assisted by the *Direcciones de Salud* (Health Directorates), their municipal representations are the *Centros* or *Puestos de Salud* (Health Centres), which are administered by so called *Redes* or *Microrredes de Salud* (Health Networks). Together with the *Dirección Ejecutiva de Saneamiento Básico* (DESAB – Executive Directorate of Basic Sanitation) it shares the supervision of sanitary aspects of human water consumption and the protection of the environment (ibid: 34).

The *ente regulador*, i.e. the regulatory agency of the sector, is the *Superintendencia Nacional de Servicios de Saneamiento* (SUNASS – National Superintendency of Sanitation Services), whose responsibilities embrace to supervise, regulate, norm, superintend, sanction and to resolve conflicts and consumer complaints in the water sector. SUNASS is financed by 1% of the total sales volume of the Peruvian EPS and constitutes a decentralized body, incorporated under public law and attached to the *Presidencia del Consejo de Ministros* (PCM – Presidency of the Council of Ministers). SUNASS is granted administrative, functional, technical, economical and financial autonomy (ibid).

Although there have been several attempts to create a General Law covering all water related issues, so far the Peruvian government has not managed to do so, so that a multitude of laws is relevant for the different aspects of the water sector. Among the most important are *Ley General de Servicios d Saneamiento* (Ley No. 26338) y *Ley General del Ambiente* (Ley No.

28611) (MVCS 2006a: 31). The municipal responsibility to render public services is stipulated in the 1993 constitution (ibid: 33).

## 5.4.1 Environmental Regulation

Whereas economic regulation has been centralised in one institutional body, the environmental aspects are still dealt with by different government departments, particularly the *Ministerio de Salud Pública* and the *Ministerio de Agricultura*. Drinking water standards are administered by the *Ley General de Aguas* (Ley No. 17752 incl. several amendments), where all Peruvian water resources are classified into 6 categories, with different characteristics and usable for different applications. The same law gives limit parameters to comply with for the different water classes, limits for the disposal of waste water and the administrative steps to apply for waste water disposal (DIGESA 1983: 1).

## 5.4.2 Economic Regulation

SUNASS is in charge of economic regulation, however, the approbation and application of tariffs is subject to a series of formal proceedings, which can make the bureaucratic implication difficult and slow. As a first step SUNASS solicits the EPS to propose a tariff increase and a related investment program, which it may accept or reject. Consequently, public hearings take place, where the viability of the suggestion is evaluated and the final tariff is fixed with SUNASS. Nonetheless, final approbation is subject to the approval of the shareholders of the EPS, which in general are the municipalities. In some cases these proceedings have provoked delays of several years (MVCS 2006a: 43). SUNASS, however, commits itself to the principles of *economic efficiency, financial viability, social equability, simplicity* and *transparency* (SUNASS 2007).

In late 1999, SUNASS established a benchmark system as a first step toward informing citizens and other stakeholders about utility performance. Consequently a system of nine efficiency indicators was developed and categorized into four groups, namely *quality of service*, *coverage of service*, *management efficiency* and *managerial finance efficiency* (Berg and Lin 2005: 4).

### 5.5 Status of Private Sector Participation in Peru

As part of a strong global PSP momentum during the 1990s, Peru's overall privatization strategy was launched in 1991, when first law amendments were passed to establish the necessary frameworks for the privatization process. By the end of the first half of the decade the Fujimori administration had already divested most of the large state-owned telecommunications and electricity companies. From 1998 on, concessions gained popularity and a multitude of contracts was signed in the transport sector, particularly for railroads, ports, highways and the Lima airport. Although the experience has not been perfect, the Peruvian PSP program is considered to be "one of the best examples in the Region" (Worldbank 2006c: 11), both in terms of institution building and attracting and mobilizing private capital (ibid).

Today enthusiasm for private participation in infrastructure has cooled considerably in Peru and public perceptions of privatization have deteriorated significantly across Latin America. Many of the reasons therefore have been named already in chapter 4. Two recent Worldbank studies confirm that Peruvians generally view PSP negatively, associating it with increasing tariffs and workers lay-offs (ibid: 20).

Water and sanitation has seen very little PSP in Peru. SEDAPAL, the only company included in Peru's initial privatization program, has not been divested or concessioned so far. As elaborated above many other attempts to tender concessions were stopped due to changes in political dogma. A positive exception is the Rio Chillon BOT project, which is considered a real milestone in Latin American water PSP (ibid: 18).

Current tendencies show that Peru is rethinking PSP in infrastructure and has chosen again the mode of concessions for its program. Counting on past experience, the following issues were identified as key areas to be integrated into the new approach: *addressing social issues* (overall transparency, a communications program, community involvement and accounting for the poor), *improving concession contract design, enhancing regulatory design* and *developing appropriate financial instruments and tapping the local markets* (ibid: 115).

## 5.6 Outlook on Traditional Water PSP Development in Peru

Full transfer of ownership, i.e. *divesture*, does not seem to be a likely option for Peru for the near future. The UK system is hardly transferable and the attempts of the Fujimori administration in the 1990s have shown the problems arising of a missing clear and credible regulatory framework. Peru's institutions are not sufficiently strong and the transfer of assets would probably not be backed by the general public and wouldn't therefore be politically executable.

For the bigger urbanisations Peru will most likely proceed with its *concession* approach. The contract signed in Tumbes proves that the concept is feasible and attractive to investors. The integration of partial donor finance shows a possible way to reach cost-recovery tariffs, without excluding the very poor. As in Tumbes there will probably be increasing interest from companies from within the continent, which will solve to a certain extent also the problems of hard currency finance and lower public resistance.

The Rio Chillon project has shown the potential attractiveness of *BOX-models*. Being an entirely locally financed project it overcomes hard currency finance problems and proves the maturity of local capital markets. Following this success, BOX could be applicable for a series of treatment plants to be constructed in Peru, but will, however, not be able to contribute to the urgently needed improvement of the water networks.

Increased stakeholder involvement to balance the interests of the public and private sector could be reached by the implementation of the *cooperation model* as executed in several municipalities in Eastern Germany. Although currently there is no political tendency towards this concept, it could be a way to raise public acceptance of PSP and has been proposed for the cities of Chiclayo and Pisco (Rudolph 2000: 7, 18).

*DBOs* have not been on the political agenda yet, but could also be an interesting option for the construction of new treatment plants, fostering holistic solutions. *O&M* or *service contracts* naturally are applicable in a very flexible way.

## 5.7 Application Potential of the Franchising Concept

The final chapter of this thesis is dedicated to the general application potential of the franchising concept and its applicability to the Peruvian water sector. In principle, two approaches seem to be thinkable. A first possibility would be to apply franchising as an integrative part of traditional PSP models for large urban centres. The second way could be to see franchising as an innovative stand-alone solution for rural areas.

#### 5.7.1 As Integrative Part of Traditional PSP Approaches

In theory, franchising is combinable with any of the above described traditional PSP approaches for large urban centres (for the sake of simplicity in the following referred to as TPAs). The franchisor would be the know-how provider and the franchisee the entity in charge of operation under the TPA scheme. The franchising contract would be completely independent from the contract between public sector entity and the TPA contractor. In principle the cooperation could be arranged, both, prior or posterior to bidding for the TPA contract.

The fundamental question, however, is, if in practice, there is a need and field of application for such a model. Currently, all enterprises bidding for TPA contracts do have the know-how to operate water infrastructure and therefore have no stringent incentive to cooperate with a franchisor to increase their know-how. The key question is, if a company, not having O&M know-how would rely on the knowledge of a franchisor to bid e.g. for a large concession contract. Who would in that case be legally responsible for securing service and water quality? For the franchisor to assume this risk, returns would need to be considerably above the returns the franchisor could make, by himself entering into the TPA contract. Would the public sector, however, allow such a constellation, with the TPA contractor having no references?

A conceivable case would possibly be a franchising contract with a local TPA contractor with some track record in water infrastructure management, but only limited experience. If, however, the local contractor would assume the responsibility for service quality, the difference to a consulting contract would be blurred. In case the franchising model is applied in its pure standard form, it's neither very likely that it will encounter less resistance from the local populations.

It seems therefore that the field of application for such an approach is not very broad. Large urban centres will continue to be the domain of the traditional PSP approaches and change will come most likely from improving the existing concepts and by making them fit with local cultures and institutions. This is in principle also in line with the original motivation to propose the franchising concept, where the idea was to develop a concept to penetrate markets (mainly highly risky, small urban centres and rural areas) which are not easily accessible via the traditional PSP approaches.

#### 5.7.2 As Innovative Stand-Alone Approach for Rural Areas

It seems therefore more promising to focus the concept on the rural sector, which has traditionally been neglected by both, the public water authorities and private water service providers. There is a strong need for innovative approaches in order to cope with the Millennium Development Goals and as seen above, also Peru suffers from a substantial inequality between service quality in urban centres and in rural areas.

Public resistance against PSP is generally higher outside of the large cities and private water companies avoid those markets, since associated risks are considerably higher and returns are not adequate, due to the small population density. Franchising seems to be an applicable solution to guarantee sustainable operation and maintenance on a small-scaleservice-provision basis under these conditions. Potential franchisees under such a scheme are recruited from local community service providers such as plumbers, mechanics, electricians and other craftsmen. The franchisor provides regular training and supervision and the franchisees operate and maintain the community water infrastructure against payment of a fee by the public water authorities. The franchisor's remuneration is a defined percentage of the franchisees turnover. For the customer, the procedure remains in principle the same as before: he continues to pay the water authority regular bills. In Peru the obvious thing to do would be to try to integrate the franchising concept into the PRONASAR system. Currently, two types of non-public bodies are involved in the execution scheme. The *operadores supervisores* (OS), who work both, on for-profit and not-for-profit basis and the *operadores técnicos sociales* (OTS), who always operate not-for-profit. Potentially there are two possibilities to implement franchising within this framework.

One possible way would be to make the OTS franchisees in order to enhance their O&M know-how and hence indirectly improve operation and maintenance within the communities. The question, however, is, whether the OTS, which are predominantly NGOs and traditionally anti-PSP, would accept such a role and which price they would be prepared to pay. Capacity building within the community would be restricted, but it would be a system easily and fast to implement and doesn't count so much on the availability of qualified labour within the community. Since the OTS continue to be the partners of the communities, acceptance levels should be high.



Figure 44: Franchising in Peru – Proposal 1.

The second possible approach, however, seems to be more sustainable, but requires also some more drastic reorganisation steps within the PRONASAR framework. Under the proposed scheme OTS's activities would be reduced to first, plant construction related issues and second, general assistance to the community and capacity building within the institutions of the municipality. Operation and maintenance would now be guided by the franchisor, who would enter into a franchising contract with a *local service provider* (LSP) with recruited craftsmen. The JASS would contract out the O&M services to the local service provider, but the know-how therefore would be provided from the franchisor company. The OS would supervise both the franchisor and the OTS.



Figure 45: Franchising in Peru - Proposal 2.

Taking into account that in the rural sector the recruited craftsmen of the local service provider would be persons from the neighbourhood and familiar to everybody, acceptance of the franchising scheme could be considerably high. In larger urbanisations this might not necessarily be the case. The approach would not need to rely on transparent and sophisticated regulation and would allow for increased stakeholder involvement. Most important, it would foster local capacity building and create employment.

The key question in order to estimate the feasibility of this approach is, whether sufficiently educated human capital is available in the Peruvian rural communities. One of the reasons to choose Peru for this case study was the assumption that a country with 0,767 HDI should possess the required human resources, capable of participating in training programs. According to 2004 UNESCO data the educational attainment of the Peruvian adult Population is as follows (numbers in brackets represent the OECD mean): 4,0% (0,0%) no schooling, 12,4% (0,0%) incomplete primary, 21,9% (12,8%) primary, 14,9% (17,0%) lower secondary, 34,3% (44,9%) upper secondary, 6,1% (7,4%) tertiary (type B) and 6,4% (17,7%) tertiary (type A). Most of these figures have been improved over the last two decades (UNESCO 2006; WORLDBANK 2001: 17). Although there seem to be substantial disparities between urban centres and rural areas, there is a solid secondary education stratum. Main focus of educational policies is currently the reduction of 'non schooling' and 'incomplete primary' groups and the empowerment of academic education (ESCALE 2005: 11). The relatively weak academic sector results also in a deficit in highly qualified engineers, which is particularly true for the rural areas. It can, however, be assumed that out of the secondary education stratum sufficient human resources can be recruited, if sustainable technological solutions are selected, which fit with local education profiles and experiences. This, nevertheless, is an assumption which needs verification by an in-depth labour market analysis.

The second question is, if there would be an interest from water companies to assume the role of franchisor in this constellation. Out of the empirical survey it can be deduced that many international operators remain sceptical, but that on the other hand there are some enterprises, which could imagine implementing such an approach. The fundamental problem is the risk of intellectual property right infringement and training of a potential future competitor. However, this issue is somehow defused on a small-scale basis, as proposed for rural areas. Infrastructure is in general low-tech under such conditions and the applied know-how to a certain degree common body of international knowledge. It is additionally highly unlikely that a local small-scale service provider leaves his accustomed territory to evolve to be a serious competitor for the franchisor.

A risk difficult to mitigate is, however, the possible case that after expiration of the first contract term, the franchisee feels himself already sufficiently competent to operate the system on his own. Dependence must be maintained by continuous know-how development and keeping the franchisee always one step behind, so that he has an incentive to prolong the contract. Assuming transparent and binding legal institutions also a certain protection by law (at least for a limited period) is possible. The success of this concept in other sectors has proven that these risks can be handled. The question remains open as to who will be legally liable for service quality and complying with the Peruvian regulations. In principle both options, i.e. the franchisor or the franchisee, are conceivable. The crucial point is that contractual regulations are clear and detailed, and that there is a strict, transparent and clear-cut split of obligations in the franchising contract. Having the franchisor to assume the guarantees will definitely increase the returns, they consider adequate and hence, indirectly, the tariffs. With tight budgets this solution may not be viable. On the other hand the application of sustainable technologies on a small-scale basis puts also the franchisee in the position to assume liabilities. This would also follow better the general philosophy of the franchising approach in other sectors, where the franchisee is considered to be an independent entrepreneur with all associated risks.

As a conclusion it can be emphasized that there seems to be an application potential for the franchising concept in Peru, although some points remain open at this stage. Though the proposed approach was based on the PRONASAR framework, it is of course also possible to establish a model from scratch outside this framework. The results of the pilot project in South Africa will bring immense, valuable insights in the advantages and shortcomings of the concept, on which basis the model can be further developed to possibly contribute to the relevant Millennium Development Goals.

## 6 CONCLUSION AND FUTURE OUTLOOK

Coming back to the original research questions of this diploma thesis, the basic idea was that the long-term experiences of the European water supply and sanitation sectors could provide valuable insights, applicable for the design and further development of innovative future PSP concepts. After providing the theoretical framework, the premium was therefore put, first, on a comprehensive and broadly based literature study. This explorative approach, including the experiences of the most important countries of the European water sector, such as the U.K., France and Germany, draws a picture of the multitude of different notions and the diversity of opinion attached to this plurality.

Since many questions remained open and many areas unexplored, the second step led to an empirical survey into the European water sector stakeholders. The rationale was that the personal experiences and ideas of people who are in touch with the sector on a day-to-day basis should be able to contribute considerably to answering the research questions of this study.

As answer to research question number one, it can be affirmed that the experiences of the European water sector are wide-ranging and complex. Many approaches exist in parallel and solutions are tailored to match the concrete needs on a case-by-case basis. The analysis of the empirical survey and the results of the literature review have shown that the undoubtedly tremendous European know-how base can be applied to a large degree in the design of new water approaches for developing countries. In answering research question number two, it has, however, to be clear that no concept is transferable one-to-one, the crucial point is to adapt as far as possible to local cultures, traditions and the legal and institutional framework.

The third research question presented the franchising model as such a possibly innovative PSP model and asked, whether it would be an efficient approach to tackle the water problems of developing countries. Based on an in-depth case study of the Peruvian water supply and sanitation sector, the model's application potential was evaluated in terms of necessity and potential efficiency.

Answering research question number three reveals a potential field of application in the rural areas of developing countries. In line with the theoretical origin of the water franchising concept, this is a segment, where private water contractors have not been willing to penetrate and where up to now PSP approaches have not proven to be easily implemented.

The analysis suggests that the franchising model should not be considered supplementary to traditional PSP concepts, which can solve the shortcomings of past failures, but rather as complementary model, with its own advantages, inconveniences and fields of application. The theoretical design sounds promising, but too many questions, which can only be evaluated after practical implementation, remain open at this point, to give a final comment on the efficiency of franchising.

For a future outlook on the applicability of the concept, the outcome of the ongoing pilot project in South Africa will be of crucial importance. The practical feedback from the implementation of the system will prove, whether simple and sustainable solutions can be found to mitigate the somehow risk loaded elements of the model. It is, however, a fact that the Millennium Development Goals can only be achieved if rural sectors and the very poor are included in the improvement of the water supply and sanitation sectors. Traditional PSP concepts have not proven to be efficient in this segment, maybe the franchising model can contribute to some progress in this area.

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Worldbank (2006c): Peru – Rethinking Private Sector Participation in Infrastructure – Towards Effective Public Private Partnerships/ Concessions in the Provision of Infrastructure Services, Washington: The Worldbank ANNEX

FACSIMILE OF QUESTIONNAIRE

TO:JÖRG GMEINBAUERFAX:+43 - 1 - 25105 - 233EMAIL:JOERG.GMEINBAUER@WABAG.COM

## **QUESTIONNAIRE - INNOVATIVE PSP CONCEPTS**

January 2007

Institute for Environmental Engineering and Management University of Witten/Herdecke

Prof. Dr. Dr. K.-U. Rudolph Dipl.-Ing J. Gmeinbauer

Interviewee:

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Position: \_\_\_\_\_

May we consider this interview to be on or off the record?

on off

Would you be willing to allow us to quote you?

yes no

## LESSONS LEARNT OUT OF EUROPEAN PSP EXPERIENCES

**1.** If you take a look at the wide range of PSP concepts applied to the European water sector: which one would you say has proven to be the most efficient one in the long run?

**2.** Please name the most important drivers for the success of the concept compared to other approaches. What are the indicators for success and how do you measure it?

**3.** What would you say are the three most important lessons learnt out of the European PSP experiences?

**4.** How do you explain the current worldwide negative publicity against water PSP?

**5.** What is your general experience with customer satisfaction under PSP schemes?

**6.** How would you judge overall employee satisfaction under PSP schemes?

## FUTURE OUTLOOK FOR DEVELOPING COUNTRIES

7. Please express your opinion on the three most important trends in water PSP in developing countries for the next 10 years.

**8.** Please name the three biggest problems to solve in water PSP in the next years. Why?

**9.** What were the main reasons for the failure of past PSP projects in developing countries?

**10.** Which approaches do you consider to be the future successful PSP concepts for developing countries and for what reasons?

**11.** How can the experiences made in Europe be implemented into innovative PSP concepts?

## FRANCHISING - AN INNOVATIVE OPTION?

**12.** Do you know the concept of Franchising O&M?

- a) Would you, in principle, accept a role as franchiser for your company (instead of concessionaire, BOT contractor etc)?
- b) Would you, in principle, accept a role as franchisee for your company (instead of concedent, BOT employer etc)?

**13.** Would you consider it an efficient and innovative option to approach water problems in developing countries?

**14.** What would you consider the advantages and disadvantages of the concept?

**15.** Would you say it could be an efficient approach to lowering public resistance to water PSP? Why?

**16.** Do you have any recommendations about available information/websites about your firm, which you would like us to disseminate?