

Assessment of a cost-covering sanitation tariff for Alexandria/Egypt

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Abstract

Alexandria, the “Second Egyptian Capital”, faces major inefficiencies regarding financial sustainability of sanitation services. Wastewater tariffs in Alexandria are only covering around 20% of the total cost and 60% of operation and management costs. Aim of the study is to assess the possibility of introducing a cost – covering sanitation tariff. For this purpose the overall influences are examined, starting with a situation analysis of Egypt and Alexandria and ending with a financial analysis of the sanitation utility in Alexandria. The assessment also includes the review of “Best practices” from Morocco and Germany and the development of scenarios for implementing a cost-covering sanitation tariff. Results showed that complexities of constraints but also optimistic policies are influencing sanitation tariff adjustments in Egypt. Optimistic policies are the newly established institutional framework, which paves the way for a less bureaucratic decision-making process. Constraints are the low public wages, which do not allow cost covering sanitation tariffs. Besides, there are other constraints like the questionable influence of the newly established regulatory agencies or the lack of service quality. Both mentioned aspects are essential to justify tariff increase. Financial analysis and affordability to pay showed that people can easily afford to pay the costs of operation and management but not the total cost. One of the developed scenarios, showed how cost could be covered within two to three years by complying to the current policy discussion.

Introduction

A sustainable sanitation situation is a precondition for a country’s development as it is related to hygiene, public health and adequate sewage disposal. Sanitation has a major impact on environment, health, economy and finally the social life. If environment is clean, risk of diseases is much lower. A healthy person means more time availability for work and less medical cost, which has a good impact on the economic growth. A well functioning economy gives finally a good basis for an acceptable social life. As consequence sanitation is a basic infrastructure and its sustainability should be treated as a major task. A major component of sanitation sustainability is the financial and administrative perspective, which is related to this work.

Financial sustainability of Egypt’s sanitation utilities is a main problem because of low tariffs on one side and low efficiency on the other side. The current legal framework, which makes tariff adjustment very complicated and the overall economical and political situation are major reasons for low tariffs. Alexandria’s or more generally Egypt’s water and wastewater tariffs are among the lowest in developing countries (Social and Economic Development Group Mena Region – MNSD 1, 2005). Sanitation tariffs are a surcharge of 35% to the water bill, which finally is a price of only 0.085 L.E./m³, (Alexandria Water Company, 2009)¹. Water and wastewater services are therefore highly subsidized which represents a

¹ L.E. 0.085 are around 2 \$ cent; \$ 1 = L.E. 0.175 (Smarthouse Media GmbH, 2009)

high burden on the national budget (MNSSED 1, 2005). However there are around 40% of Egypt's urban population (Mediterranean Component of the EU Water Initiative -MED EUWI 1, 2009), which rank among the poor.

Another problem is the fact that sanitation is counted to public goods, where no one can be excluded from using them. Public goods could lead to market failure if their prices do not reflect their real value. In this case people start to be wasteful because finally this "good" do not belong to anyone. However the same is with water and sanitation services in Egypt as they have a very low price, which do not reflect the real cost. For this reason people do not have an incentive to consume less water and indirectly wastewater. The domestic per capita water (and wastewater) consumption in Egypt is around 237 l/c/d (Mediterranean Component of the EU Water Initiative -MED EUWI 2, 2009), a very high figure, which needs to be reduced drastically. Average domestic consumption in Germany, a considered water rich country, consumption is only 122 l/c/d (Statistisches Bundesamt Deutschland – DSTATIS, 2009).

A cost-covering sanitation tariff, which at least covers operation and management costs is a first step for an efficiently working sanitation company, as it will reduce the high burden on national budget and moreover give the right signal to consumers in order to save resources. The objective of this work is to assess a sanitation cost covering tariff for Alexandria/Egypt. In other words it is an examination of the possibility to introduce a cost covering sanitation tariff in Alexandria.

A study conducted by KfW (Kreditanstalt für Wiederaufbau) on behalf of the German/Egyptian Financial Cooperation with the title "Study on Cost Coverage For Wastewater Project in Ameriya" was a major source of information for this study. It assessed the financial statement of the local wastewater utility and the affordability to pay of the poor population. Another source of information was a report, which was conducted on behalf of the Mediterranean Component of the EU Water Initiative and it was issued under the title "Financing Strategy for the Water Supply and Sanitation Sector in Egypt". Furthermore the literature review included several sources on the specific situation of Alexandria like the „Alexandria City Development Strategy" which was published in 2008 by the City Alliance Group and the World Bank. Finally the theoretical background on natural monopolies was discussed. This part included the price theory of natural monopolies and why prices are set at average total cost instead of calculating marginal costs. Moreover the literature review include background information on wastewater tariffing, which was a review on possible tariff designs and the principles which have to be considered when designing a new wastewater tariff.

Methodology

The work was build up in a way to assess first the current situation and later to develop strategies how the current situation could be improved. The situation analysis and the assessment of income statement gave information on the current situation. They included an overview on the framework, which has an influence on sanitation tariffs. The situation analysis was based on literature review and on consultation of branch specialists in Egypt. The financial part of the current situation was based on estimations of the revenues and expenditures. It also included a calculation of a cost-covering sanitation tariff.

The third and fourth step of the assessment examined the possibility of introducing a cost covering tariff. This includes the review of the best practices (Morocco and Germany) and

the development of scenarios, which simulates alternatives to the current cost covering tariff. The “best practices” or country reviews gave finally useful information how the financial sustainability of sanitation in Alexandria and Egypt could be improved. The cost covering scenarios were based on actual policy discussions on the financial sustainability of water and wastewater in Egypt.

Results and Discussion

Alexandria and Egypt

Alexandria is a Mediterranean city with 4.2 million inhabitants (Governorate of Alexandria, 2009). It is the second largest city in Egypt after Cairo and therefore it is also known as the second capital. Egypt’s major port is located in Alexandria (Alexandria Port Authority, 2008) and about 60 % of Egypt’s trade is handled through the ports of Alexandria, which makes the city a major income source of the country. Moreover one third of Egypt’s industry is located in Alexandria. (Egypt State Information Service; 2009). Alexandria is also a major tourism destination, where many Egyptians spend their summer holidays. That makes tourism another major income source.

Nevertheless the city is facing some challenges, which are the huge population growth, unemployment, informal settlements, infrastructural weaknesses and the degradation of environment (Governorate of Alexandria, 2006). The official unemployment rate was 7.1 % in 2004 (City Alliance Program, 2008). Besides the city has to create 40.000 jobs each year because 51% of the population is under 20 years old. These figures give an impression on the city’s challenges concerning future population and economical situation. It is expected that population will reach 5 million by 2029. All these people have finally to live in an environmentally clean city with a sustainable sanitation system.

Informal settlements are considered as another challenge because they are suffering in many cases from weak sanitation situation. That leads often to serious environmental problems which affect public health. In most cases they are not connected to sewer networks or they suffer from bad services. Alexandria has in total 30 of those informal settlements where 1.36 million people live (Center for Environment and Development in the Arab Region and Europe – CEDARE 2007). The weak sanitation situation leads of course also to huge social problems because of day-by-day difficulties and illnesses.

Another challenge is to cope with huge pollution, caused by domestic and industrial wastewater. Until the 1980’s domestic and industrial sewage were discharged into the Mediterranean Sea, where it caused huge pollution of beaches and degradation of aquatic life. Therefore the local authorities decided to discharge wastewater into Lake Mariout. Before that time the lake was a main income source for fisheries and moreover a recreational area for birds, aquacultures and also a touristic area (City Alliance Program, 2008). The discharge of sewage, industrial wastewater and nutrient rich agricultural drainage into the lake caused huge degradation of the lake’s water quality and its biodiversity. Major income sources are the industry and tourism and both sectors need a sustainable sanitation situation and a clean environment.

The overall situations of Alexandria and to a wider extent of Egypt are the major driver towards a “financially” sustainable sanitation situation. From the economical side Egypt has a high GDP growth rate, which was 7.2% in 2008. Such a growth rate can only be kept up if

there are among others sustainable infrastructures. Sanitation is of course a major component of infrastructure as it protects the environment and therefore prevents illnesses. Also from the point of Egyptian water resources there is a need for more efficiency. Egypt is nowadays a water scarce country as it has less than 1000 m³/capita/year (The Earth Institute at Columbia University, 2009) and water resources are heavily exploited (United Nations Environmental Program – UNEP, 2008). Reasons for that water scarcity are the huge population growth, economical growths and irrigated agricultural. But reasons are also the relatively high per capita water use and the very low tariffs. If water and wastewater would be priced correctly in order to reflect the real costs than there will not be such wastage.

Sanitation Situation of Alex

The city of Alexandria has 100% coverage of water supply but still lacks wastewater coverage. The number of residents in 2004, which were connected to the wastewater collection network, was 3.35 million (KfW, 2005). This figure represents about 670 thousand households, which are 85% of the population. Two years before the coverage was only 73% (KfW, 2005). Remaining population, which is not connected, has either a septic tank or discharges their wastewater directly into open water bodies, like canals (KfW, 2005). Moreover there is an annual growth of 3% for sanitation connections (KfW, 2005).

The sanitation network of Alexandria is one of the oldest in whole Egypt and it dates back to 1912 (Misr Consult, 2009). The total length of the sanitation network is 305 km and there are 82 pumping stations and 10 wastewater treatment plants (WWTP) serving the city. The WWTP have a total capacity of 1.462.000 m³ per day. The two main WWTP are the western and the eastern WWTP and they have a total capacity of 1.067.000 m³ per day, which represents 73% of the cities total wastewater treatment capacity. Both treatment plants do only primary treatment. The consequence is a bad effluent quality as only 33.46 % of WWTP samples are in compliance with the regulations of the ministry of water and irrigation (MWRI), which sets the standards for effluent quality (Chemonics Egypt, 2008). The effluent of Alexandria's WWTP is directly discharged into Lake Mariout which cause the great deterioration of the lake's water. Main problems are that WWTP are overburdened and therefore construction works started in order to expand their capacities. The two major WWTP will have an additional capacity of each 220.000 m³. The construction works for all WWTP will increase the overall capacity by almost 35%.

At this point it is important to mention that there are no service standards in Egypt concerning water and wastewater services (Chemonics Egypt, 2008). Such a service standard is a target minimum performance of a utilities product or service. Wastewater service standards would be e.g. WWTP odors, sewer overflows or response time of corrections. Moreover they include other service standards like the response time to complaints or ease of telephone contact. Until now efficiency improvements have only been adopted in order to improve the operation and management efficiency of service providers. There are no service standards, which determine the quality of service. Efficiency performance standards are only on the supply side on water and wastewater service. A service standard determines one part of the contractual relation between service provider and service user. The other contractual part is the users responsibility to pay the cost of service. Such a service standard would bring in transparency and it would justify the reason for increasing tariffs. It will not be possible in the future to implement a tariff and to enforce payment if the utility do not meet minimum service standard.

Policy of Water and Wastewater

The high financial burden on the nation's budget represents another important challenge. Nowadays the water and wastewater sector has to face more and more competition from other sectors like health care, education, transportation and telecommunication (Biswas et al., 2008). The deficit, which was generated from the water supply and sanitation sector, was \$ 1.3 billion up to the year 2003 (MED EUWI 2, 2009).

The vision of the government is to ensure a fiscal sustainability of water supply and sanitation, which includes the exploration of alternative cost sharing arrangements (MNSD 1, 2005). Moreover it aims to implement a progressive turnover of O&M costs. Generally the term financial sustainability appears often in the policy goals of water supply and sanitation, which shows that there is a political will for changing the current situation.

The recently in 2009 conducted MED EUWI Policy Dialogue on the Financing Strategy for Water and Wastewater in Egypt seems to outline new ideas, how the new policies on water and wastewater could look like in the near future. Participants agreed on reducing average domestic water consumption from 237 l/c/d to 150 l/c/d by 2026 (MED EUWI 2, 2009). Moreover it contains a lifeline consumption, where the first 100 l/c/d should not exceed an amount of 2% from total household income. The scenario involves also other tasks, which are the increase of wastewater treatment to 100% biological by 2026, the increase of bill collection from 48% in 2006 to 95% in 2015, reduction of discharge of untreated wastewater from 27% in 2006 to 0% in 2026 and other issues. Regarding cost coverage it includes an increasing block tariff where some scenarios show that tariffs could be increased gradually by almost 300%. However, it seems that sanitation tariff are unchanged, which means that the current 35% surcharge on the water bill will be kept. Discussions also include the protection of the "extreme poor" which have less than \$ 1,25 per day. They will be excluded from paying tariffs.

Other policies with influence on sanitation tariffs

The overall political, economical and social situation is considered to have a great influence and constraint on decision making in Egypt towards sanitation tariffs. In general Egypt faces a huge price distortion for many basic products. Main products like bread, sugar, oil, gas and petrol are highly subsidized. The same is with public goods or services like water supply, sanitation or transportation. Finally this means, that the prices of main products do not reflect their real value, this issue leads to a market failure (Shogran et al., 2001). When prices do not reflect the real value of a good than people start to be wasteful.

On the other side subsidies are needed because of the very low wages especially in the public sector. People cannot afford to pay the real prices of goods, that issue leads consequently to the low productivity. If an employer does not properly value the work which is done, than employees will start to be unproductive. These factors are few and shortly described but finally they lead to social pressure and the present political decision to keep tariffs low.

Therefore the Egyptian government started to implement a new macro economical policy where it shift its responsibility as the main provider of jobs, goods and subsidies to the population (Social and Economic Development Group Mena Region, The World Bank – MNSD 2, 2005). The aim is to reduce subsidies, increases wages and at the time covers costs through tariffs. This could be seen as the major progressive shift in the Egyptian economical policy. Moreover the Egyptian government established a social safety net where

cash transfers to the poor are increased in order to allow them to pay non-subsidized prices.

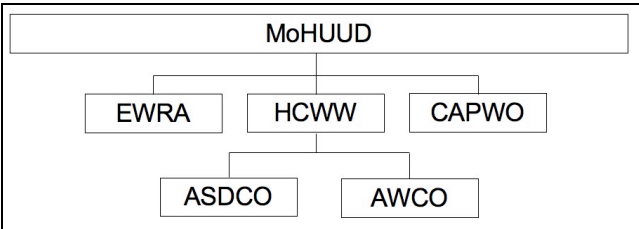
Institutional setup and legal framework

Before 2004 water and wastewater utilities were public authorities (MED EUWI 2, 2009). At that time the utility had to report to the governor. The governors had the authority to set water tariffs, which includes sanitation tariffs up to a benchmark of LE 0.23 (around 2 \$ cent) per cubic meter.

In 2004 presidential decree 135/2004 and 136/2004 changed the institutional framework of water and wastewater sector in Egypt by converting the public authorities into public companies and by integrating them into the newly established HCWW-Holding Company for water and wastewater (MED EUWI 2, 2009). Presidential Decree 135/2004 was established under Law 203/1991 of the public business sector, which has given the HCWW greater managerial and organisation autonomy. The holding company and its affiliated companies are completely self-sufficiency when it comes to operation and management. This includes also financial responsibility. With the new law the Holding Company for Water and Wastewater is not allowed to receive state funding. It has to look for commercial financing or borrow money from the National Investment Bank. Another major reform was the introduction of a regulatory agency for water and wastewater the so called EWRA-Egyptian Water Regulatory Agency (MED EUWI 2, 2009). The EWRA was established in 2006. It has several tasks like undertaking cost of service studies or assisting utilities in preparing tariff adjustment application. Moreover it is considered to be one day the final decision making agency deciding on tariff adjustment. Nevertheless tariff adjustment decisions still need the agreement of the Cabinet High Committee on Policy and Economic Affairs. It is assumed that this will change as soon as the Egyptian Government amends the new water law.

The HCWW and EWRA are affiliated to the MoHHUD which is responsible for the planning, designing, constructing and supervising water and wastewater treatment plants and main networks in Greater Cairo and Alexandria (MED EUWI 2, 2009). Cairo Alexandria Potable Water Organisation - CAPWO which is responsible for design and construction is also supervised by MoHHUD. The construction works of, e.g. new wastewater treatment plants, are funded by state budget and they are handed over to local water and wastewater companies after completion. So it is not the responsibility of HCWW and its affiliates to finance new investments.

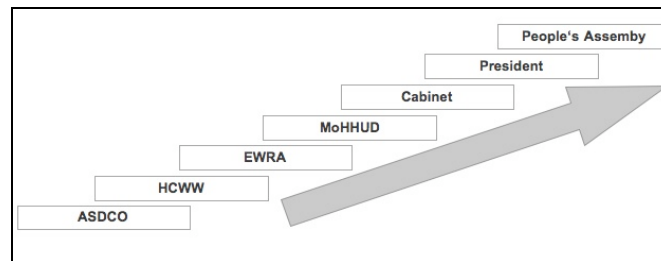
Services of water supply and sanitation in Alexandria are provided by two different companies, which are finally affiliated to HCWW. ASDCO-Alexandria Sanitary and Drainage Company is responsible for the collection, treatment and disposal of wastewater in Alexandria. AWCO - Alexandria Water Company is responsible for drinking water treatment and supply. There is a strong linkage between both companies because billing and collection of water and wastewater is done by AWCO. Nowadays ASDCO employs 5066 employees and it serves an area of 2679 km² (Holding Company for Water and Wastewater – HCWW, 2008)



Generally the new legal and institutional framework has major advantages towards the former one (Osgood, 2009). Each affiliated company is responsible for its own financial performance that means finally the utilities have to restructure their organisation in order to increase their efficiency.

The utilities could practice benchmarking as they are now connected through the HCWW. That will help to improve the technical and financial performance. Another advantage is the increased managerial autonomy of the Holding company. Affiliated companies are no more subject to the governmental civil service regulation and they can make use from economies of scale advantages. Final advantage is the reform in tariff adjustment. In the past new tariff settings needed an agreement of many different authorities like local council, Cabinet high committee on Policy and Economic Affairs and the national parliament (MNSD 1, 2005). The reforms changed this process. First of all the local council and governors were completely excluded from tariff decisions.

Nevertheless the decision making process of adjusting tariffs is still a very complex issue. The whole process still needs the agreement of seven different instances (see next figure). Therefore domestic water and wastewater tariffs have not been adjusted since 1992.



The new policies show that there is a political will to change the situation. The political will is the basis for any further action. However reforms seem to be implemented with great cautiousness. First the government want to have a strong control on water and wastewater management in Egypt, which means that it won't be able to handover the operation and management of water and wastewater to private companies (Biswas et al. 2008). Looking to other sector like e.g. the solid waste sector, decisions are taken differently. Solid waste operation and management in Cairo and Alexandria are in the hand of private sector. Veolia e.g. operates and manages solid waste in Alexandria.

A weakness, which can also be seen as an opportunity concerning tariff adjustment, is the total exclusion of governors. In the past water and wastewater utilities had to report to governors, which were also major decision-makers for tariff adjustment. Governors had even the authority to implement lower tariffs than those, which were decided on a presidential decree. Nowadays the governor and thus the municipality are completely excluded from the decision-making process. This issue can be seen as a major opportunity towards an easier decision-making process, when looking to the usual Egyptian bureaucracy. This bureaucracy and the interest of many different decision makers are finally a major reason why tariffs are not frequently adjusted. However the governor and the municipality are important decision makers as they are representing and managing the city.

Moreover there is also a weakness regarding the EWRA and its establishment. The EWRA like the HCWW are controlled by the MoHHUD. A regulatory agency with its monitoring function should be more independent. When EWRA is controlled by MoHHUD than it represents the interests of the ministry and it cannot be neutral. But the task of EWRA is to

decide one day on tariff adjustment, which also includes many different perspectives and interests. The EWRA has to find a compromise between cost coverage and social affordability or between technical capacity and environmental issues. Therefore it has to represent the interest of many different parties. A further remark concerning the new and former legal framework has to do with the administrative centralization of the country. It is the policy of the country to unify tariffs throughout the republic. So there is no possibility to increase tariffs in Alexandria and to leave out Cairo or other cities (Osgood, 2009). This issue will represent another constraint for EWRA and its independancy. The question would be how EWRA will adjust tariff according to the local conditions and complying with the overall policy of same tariff all over the country.

Sanitation tariffs in Alexandria

As mentioned before tariff rates are mostly the same in all governorates as the Cabinet High Committee on Policy and Economic Affairs is setting its level (Chemonics Egypt, 2008). Water and Sanitation tariffs can not be separated from each other because sanitation tariffs are a surcharge of the water bill. Sanitation tariffs are 35% of the water bill, which means that these percents are added to the water bill for sanitation purposes.

Egypt applies a progressive block tariff system for charging domestic water and wastewater. Industrial users are charged according to the consumed quantity. User charges are divided into three main groups domestic, commercial/industrial, and non-profit organisation. The different governorates seem to be free in designing their block tariffs but for the first 10 m³ the tariff must be charged for L.E. 0,23/m³ (US \$ 0,04)⁶ and second block shall have a tariff of L.E. 0,30/m³ (US \$ 0,05). ASDCO applies a three block system. It charges L.E. 0,23/m³ (US \$ 0,04) for the first block, which consists of 10 m³ per household, L.E. 0,30/m³ (US \$ 0,05) for the second block, which is between 10 m³ and 30 m³ and L.E. 0,40/m³ (US \$ 0,07) for the third block, which is above 30m³ per household (see table 4)

Type/ User	Water tariff (L.E./m ³)	Wastewater Surcharge in %	Wastewater tariff (L.E./m ³)	Wastewater tariff (\$/m ³)
Domestic Sector (Households)				
0-10 m ³	0,23	35%	0,085	0,014875
10-30 m ³	0,30	35%	0,105	0,18375
> 30 m ³	0,40	35%	0,14	0,0245
Construction works	0,80	70%	0,56	0,098
Non-Profit Organizations				
Place of worship etc.	0,42	35%	0,147	0,025725
Sports Clubs etc.	0,15	35%	0,0525	0,0091875
Social Clubs etc.	1,00	70%	0,70	0,1225
Commerce and Industries				
Small commerce and factories	0,70	70%	0,49	0,08575
Large factories	1,00	70%	0,70	0,1225
Feeding Tube < 30mm				
Large factories (Ameriya/Burg el Amb)	1,50	90%	1,35	0,23625
Petroleum & Derivatives	3,50	70%	2,45	0,42875
		(if connected)		
Private hospitals/Hotel	1,15	90%	1,035	0,181125
Soda Water companies	2,00	70%	1,40	0,245
		(if connected)		
Port	12,00	0	0	0
Bulk Supply to Beheira	0,25	0	0	0

The wastewater tariffs are too low and therefore they do not cover O&M costs which will be discussed later more detailed. Otherwise Alexandria is one of three Egyptian cities, which covers it O&M cost, depreciation and debt service of water service (Chemonics Egypt, 2008).

A precondition for adequate tariff is the availability of water meters. It seems that the majority of all buildings is equipped with water meters (KfW, 2005) but not all-flat or housing units are equipped with water meters. In many cases one meter is connected to many households where the bill is equally divided (MED EUWI 1, 2009). An evidence for that is the difference in registered number of accounts at ASDCO and the actual number of flats. The estimated number of household accounts is 776,434 but the number of housing units in Alexandria

1,766,918 (Egyptian Central Agency for Public Mobilisation and Statistics - CAPMAS, 2008). It means that all flats of a multi-storey house often are dividing a bill and each flat pays the average amount. This situation could never provide incentives for users in order to reduce their wastage of water and (wastewater). Therefore there should be a policy for individual apartments to install meters.

Collection efficiency is estimated to be between 65% and 70% (MED EUWI 2, 2009). Water and sanitation bills are distributed to the user every two months. Moreover household fee collection is done in cash. However some users pay on quarterly, semi annually or annually basis, which creates accounting problems for ASDCO, due to transfer fluctuation. AGWA charges 5% to ASDCO for the compensation of billing and collection.

Affordability to pay

The affordability to pay is the upper limit a household can pay without undermining the ability to pay of other vital goods and services (MED EUWI 1, 2009). Affordability problems occur, if households cannot afford paying water supply and sanitation bills. A general rule indicates that a household shall spend between 2% and 5% for water supply and sanitation (MED EUWI 1, 2009). The affordability assessment report, which was prepared by the Mediterranean Component of the EU Water Initiative, indicates that Egyptian households spent in average 0,81 % of their expenditure on water supply and sanitation bills (MED EUWI1, 2009). Moreover it states, that the poorer the population the more they spend as a share of total expenditure. Finally it was found that 11% of the population spend between 1% and 1.45% on water supply and sanitation. It is one of the future policies to exempt the poorest strata from paying water and wastewater tariffs, which means that maybe these 11% would be exempted from paying water and wastewater tariffs.

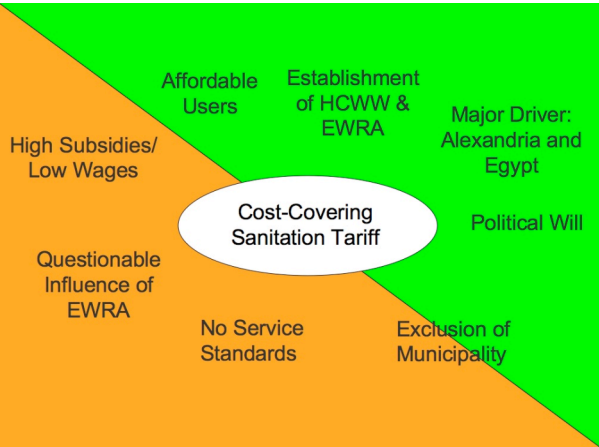
Discussion of the Results

Two noticeable issues have to be addressed at the beginning, which are also major outcomes of the current situation. First one is the very strong relation between water supply and sanitation. Both sectors are naturally related but it seems, that they are never discussed separately. In Egypt it is not possible to discuss sanitation tariffs and to leave out water tariffs as they are seen as one package. There are no discussions about changing the wastewater surcharge, which means that a surcharge of 35% will be kept. But it is important to recognize that sanitation services are more costly than water and their aim is to protect the environment and thus also water resources.

The second noticeable issue is that it is not possible to discuss sanitation tariffs in Alexandria and to leave out Egypt. It seems like it will not be possible to implement different water and wastewater tariffs throughout the country, as it would be politically and perhaps also constitutionally unacceptable (MED EUWI 1, 2009). The problem is that a city like Alexandria faces another sanitation situation than e.g. Fayoum or Cairo. There is only little room for flexibility in order to react on the own circumstances and problems.

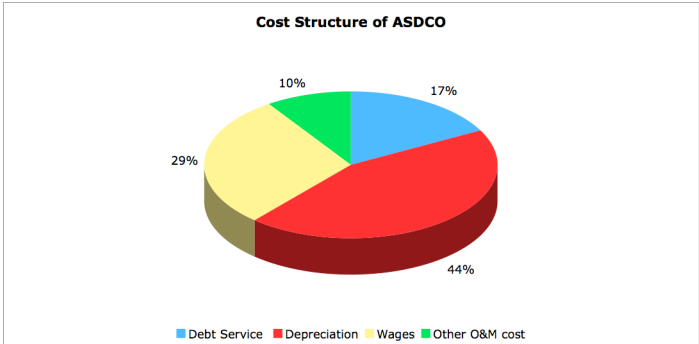
All the above-mentioned factors show that an increase or a cost covering sanitation tariff is a function or is dependant on a diversity of complex issues. There have been already several riots because the government increased the price of bread in the past years (Guardian News and Media Limited, 2008). This issue shows finally how price increases in Egypt can end. But on the other side the implementation of cost covering tariffs, which reflect the real costs of

goods and services, are unavoidable in order to cope with future challenges. The following figure gives an impression on the drivers, constraints and the optimistic achievements towards a cost covering sanitation tariff for Alexandria.



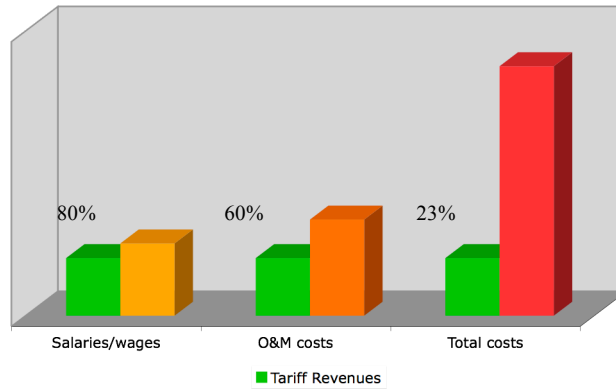
Financial analysis

Wastewater tariffs are the main income source of ASDCO. They represent more than 95% of the total income, which shows the great dependency on tariffs. The cost structure of ASDCO is mainly dominated by depreciation costs which consist of 44%. The depreciation costs are followed by wages (29%), debt service (17%) and other O&M costs (10%).



Operation and maintenance costs are dominated by salaries and wages, which are around 75%. These costs are accounted to fix costs because they are paid to permanent staff. Remaining O&M costs are variable and their share is around 25% of total O&M costs.

Results of the income statement showed that revenues cover only 23% of total cost and 61% of O&M costs. Moreover they showed that even the salaries are higher than the revenues. That shows the huge inefficiency and the need for urgent action. Actions are on one hand side to increase efficiency of the company, which includes among others the reduction of expenses for wages and on the other hand side to increase tariffs.



Comparing the cost structure of a German utility e.g. to that of ASDCO shows the great inefficiency. In Germany the share of wages is only 14% of total cost compared to Egypt where it is 29%. However the reason for those high public wages were already discussed earlier.

Cost covering tariffs

At present time a household spends in average L.E. 3.6 each month and an industrial/commercial user spends in average L.E. 58 for wastewater per month. If tariffs were set at O&M costs, than a household would spend in average L.E. 9 each month and industrial/commercial user would spend in average L.E. 63.3 per month. If tariffs were set in order to generate total cost, than household would spend in average L.E. 23.3 and industrial/commercial user would spend L.E. 164. In order to cover O&M cost of households it means to increase their tariff by 150% and to cover O&M costs of Industries it would mean to increase their tariff only by 9%.

	Household	Industries etc.
Est. actual average tariff in L.E./month	3.6	58
Average tariff covering O&M cost in L.E./month	9	63.3
Average tariff covering total cost in L.E./month	23.3	164

The comparison of cost covering tariffs and affordability to pay showed finally that people in Egypt and Alexandria afford to pay higher tariffs for water and wastewater. An increase of sanitation tariffs to an income share of 2.03% would cover the O&M costs but in order to cover total cost the income share on sanitation has to be more than 5%. Finally that means that it is possible to increase a tariff in order to cover O&M costs but it won't be possible to cover the total costs. Moreover it must be noted that these figures are representing averages. They do not reflect the income impact on income for poorer population.

Expenditure on sanitation from Income	Sanitation Tariff (in L.E.)	Sanitation Cost Coverage
0.81 % =	3.6	
2 % =	8.88	
2.03% =	9	O&M
3 % =	13.3	
4 % =	17.8	
5 % =	22.2	
5.25% =	23.3	Total Cost

The assessment on affordability to pay was only based on domestic users therefore industrial and commercial users are exempted.

Best Practices - Kingdom of Morocco

The Kingdom of Morocco and Egypt can be described as a similar situation concerning water supply and sanitation. The majority of the population (82%) has access to improved water resources, with a major part connected to improved piped water in their house, public stand pipes or protected wells (WHO/UNICEF, 2008). The overall rate of connection to the sewerage system is currently estimated at about 70% (Ministry of Interior Morocco, 2005). The sanitation situation is also similar to the Egyptian situation as the connection rate of large cities is 76%, of medium cities is 67% and small cities is 40%. Generally one can say that it is the poorest who has no access to improved sanitation facilities.

The annual wastewater volumes are following an exponential trend. In 1960 the discharge was 48 million m³ and in 2005 it became 600 million m³. Furthermore it is estimated that discharge will increase to 900 million m³ by 2020. This huge increase in discharge leads to an immense pollution of environment. A major reason for the pollution is the discharge of untreated industrial wastewater to the sea or other water bodies. Like Egypt the Kingdom of Morocco was late in providing adequate infrastructure for purifying domestic and industrial sewage. In the end huge environmental degradation was the result.

In 2005, the interministerial commission for water set the goal to establish a national program for wastewater and sewage treatment, in order to reduce the delay in this field and to restore the quality of water bodies, the coastal areas and the natural environment. This program aims also to cope with the Millennium Development goals of reducing the share of population, without adequate access to sanitation. The overall goal of the National Sanitation Program is to reach sanitation coverage of 80% for urban areas and to abate pollution by at least 60%. Moreover the program includes an upgrading of the sanitation sector, which furthermore includes the building of 260 new wastewater treatment plants and an additional network with a length of 2,300 km till the year 2015. But the program does not include cities, which are managed and served by private concessionaires. The total amount of the investment is around 43 billion Moroccan Dirham. The program aims also to focus on other issues, like the promotion of economic activities, job creation, development of tourism, possibility to reuse treated wastewater, reduction of environmental degradation and reduction of health risk.

In Morocco, municipalities have the full power and responsibility to manage sanitation services. The municipality is allowed to decide whether there shall be a direct control of independent administration, concession or other forms of management delegations (Ministry of Interior - Morocco, 2005). In many cases strategic alliances are practiced where different network providers gather in order to benefit from economies of scale.

Water and wastewater tariffs differ according to locality, consumed quantity, type of service provider and the type of user (Ministry of Interior - Morocco, 2005). Water and wastewater tariffs in cities are higher than those of other Mena countries, although they do not cover full cost of service. In Morocco the tariff system is based on the principle of covering the cost of operation and maintenance (Ministry of Interior - Morocco, 2005), but this target is not achieved in many cases. On the one hand side the tariffs often are too high for the poor population but on the other hand side the country has a very cost intensive sanitation program which needs to be financed. Of course it will be impossible to cover the total investments by tariff but it is decided that they shall bear the bigger share. The other share will be the

contribution of the state.

Best practices - Germany

Germany is one of the most advanced countries in Europe, regarding sewerage and water connection as it has almost 100% coverage of water supply and sanitation (WHO/UNICEF, 2008). The majority of the whole population is connected to wastewater treatment plants with secondary or even tertiary treatment facilities and sludge treatment works (ADB 1, 2003).

Water supply and sanitation in Germany is mainly owned by public sector (ADB 1, 2003) and municipalities are responsibility for service. Around 95% of water and wastewater service providers are fully owned and managed by municipal governments (ADB 1, 2003). Water supply and sanitation are provided by different entities at the same locality. Sanitation service differs from water supply service as it is seen as a sovereign core responsibility “Hoheitliche Pflichtaufgabe” (EGLV, 2005). It is a primary responsibility of the municipality to provide sanitation service and therefore a private company cannot directly provide the service. Most municipalities provide the sanitation service directly, but they can contract a private company for the operation. Another interesting issue is that sanitation services are not subject to corporate taxes. There are many cities in Germany, which organize water supply and sanitation with other services like electricity, public transportation or gas supply. This gives them the possibility to cross subsidize each other and to make use of economies of scale.

Germany is one of the countries with the highest water and wastewater tariffs among the developed countries. Also there are arguments that the country wants to demonstrate its national commitment for the preservation of natural resources (ADB 1, 2003). In this context the country applies the polluter pays principle where specially industries are charged according to their polluted effluent.

Average German water and wastewater tariff and annual bills

	Water	Wastewater	Total
Average Tariff (2004)	€ 1.81	€ 2.14	€ 3.95
Annual Bill (2006)	€ 85	€ 111	€196

Source of Information: (EGLV, 2005) and (BDEW, 2008)

Service providers and municipal councillors determined water and wastewater tariffs (ADB 1, 2003). This practice takes into account different interests. The municipal chancellor is representing interests of the users and the water and wastewater suppliers are representing the supply side of the service, together they control the tariff. Tariffs are subject to the municipal law for charges “Kommunenabgabengesetz”, which implies that tariffs have to cover the full cost of operation and management as well as capital replacement and debt service. In many cases the wastewater charge consist of two components one, which is related to the infrastructure provision cost, and the other one, which is related to the running costs. The component, which is related to the infrastructure, is generally a fixed amount, the other part is variable according to the consumption. It is not allowed that the fixed part exceeds 50% of the water bill (Dudey et al., 2009), the reason for that regulation is to give incentives for consumers to save water and (wastewater). Generally subsidies are rarely available in Germany, which also threatens the wastewater utilities to cover their costs through tariffs. One of the principles is that prices should reflect the cost occurred by each consumer type(ADB 1, 2003).

Scenario Development

The developed scenarios were based on ideas, which were presented during the MED EUWI Consultation Event on “Financing Strategy for the Water Supply and Sanitation Sector in Egypt”. The report, which was prepared on the Affordability assessment, included several scenarios where one scenario namely “Scenario 2” seemed to be the most ambitious. It is the most ambitious because it recognizes the affordability to pay up to a certain level and above this level tariffs increase rapidly. The most important figures of “Scenario 2” will be summed up in the following table:

Table 9: Important indicator for scenario development

Indicator	Value
Lifeline Consumption	100 L/c/d
Total Expenses of first 10m ³	15m ³ per household/months 2% of Household income (according to 4 th rural income stratum)
Water tariff / m ³ (<15m ³)	L.E. 0.75
Wastewater tariff / m ³ (<15m ³)	L.E. 0.26
Water tariff per m ³ (>15m ³)	L.E. 2.30
Wastewater tariff / m ³ (>15m ³)	L.E. 0.80

Source of information: MED EUWI 1, 2009

If this scenario is going to be implemented than it happens gradually over the next ten years in order to reach a benchmark in 2018. Moreover the scenario indicates that domestic water consumption has to be reduced from an average of 237 lcd in 2006 to an average of 150 lcd in 2026 (MED EUWI 1, 2009).

Both of the following scenarios are based on the above mentioned figures and the possibly implemented policy. The first one of the two is a strict implementation of the above mentioned figures and it is based only on a rising block tariff which is applied to each household account. The second approach or scenario combines a minimum charge with the rising block tariff. The approach depends on both the number of household accounts and the number of housing units. However a housing unit can differ from an account because finally an account could be a multi-storey house with many housing units. That means that accounts do not represent the real number of housing units. The number of housing units in Alexandria is 1,766,918 (CAPMAS, 2008). The approach is that each housing unit has to pay the minimum charge, which will include the first 15m³ (lifeline consumption) at an affordability rate of 2% (gradually rising till L.E. 0.75 per m³ in 2018). The remaining consumed water (wastewater) will be charged to an account because only the registered accounts have a metering system.

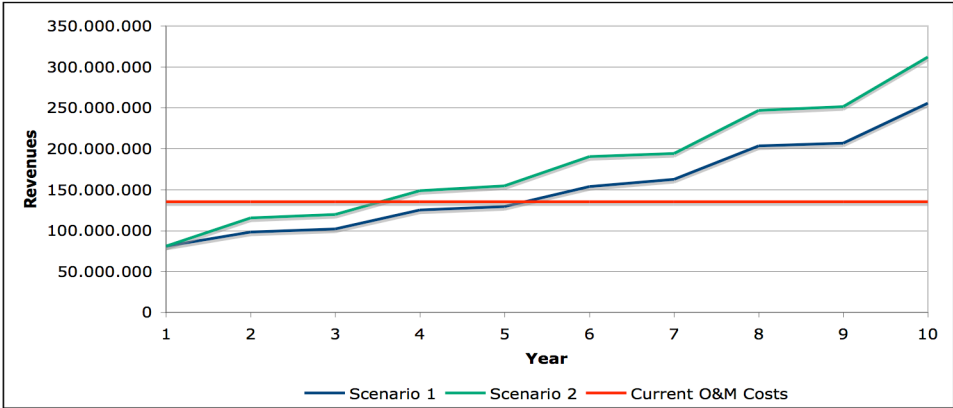
Both scenarios showed an improvement to the current situation. In the first scenario the current O&M cost would be covered at the beginning of the 5th year and in the second scenario they would be covered at the beginning of the 3rd year. The average sanitation tariff of both scenarios will rise gradually from L.E. 4.92 (in 2010) to L.E. 13.82 (in 2018). After 2018 it will decrease gradually because it is assumed that people will consume less, which will have an impact on the average household bill.

Table 16: Development of consumption and tariffs for both scenario

Year	2010	2018	2026
W&WW consumption (l/c/d)	237	183	150
Average household tariff (L.E.)	4.92	13.82	9.9

The second scenario is more profitable as it generates higher revenues within a shorter period. It is modified in a way that each housing unit has to pay a minimum charge. The application of a minimum charge is common practice in Egypt as the example of Beheira Water and Wastewater Company showed.

Figure 16: Comparison of revenues for scenario one and two



This type of tariff could be very attractive especially for Alexandria because many flats are only occupied during summer time. The number of Egyptian tourists visiting Alexandria in summer varies between 800,000 (KfW, 2005) and 2 million (City Alliance Program, 2008). They either use a flat or go to a hotel. It is assumed that these flats, which are occupied during summer, are free of charge for the rest of the year as they only pay for the consumed water (wastewater). But finally there is an infrastructure and an available service, which costs a huge amount of money. A minimum charge could be a solution of charging these flats. But of course this minimum charge would be adapted for all flats in Alexandria and not only for tourist flats. The weakness of this scenario is that it needs additional efforts in order to register each housing unit in Alexandria if there is no information given on them.

Conclusion and Recommendations

The assessment showed, that there is no cost coverage in Alexandria at present time. Revenues, which are mainly tariffs, are covering only 23% of total cost and 61% of the O&M costs. Reasons are on the one hand side inefficiency and very high expenditures on wages, which are even higher than the generated revenues. Moreover water and wastewater tariffs are very low and they have not been adjusted since 1992.

There are several different reasons why tariffs have not been adjusted until now. Reasons are low public wages and the huge price distortion of major goods and services. Many products and services are highly subsidized, which is done in order to give people the affordability to pay for those basic goods. Therefore tariffs do not cover costs. However first steps have been taken in order to overcome this problem. The new economical policy aims to increase wages and decrease subsidies gradually.

The former institutional framework is another reason for the low tariffs where six to seven different decision makers had to agree on tariff adjustment. This also is gradually changing, as EWRA will be the final decision-maker for tariff adjustments. Nevertheless EWRA's influence is still not clear as it represents the interest of only one ministry, namely MoHHUD. Another problem is the total exclusion of governors, which were major decision makers in the past for tariff adjustment. This issue could create conflicts among different stakeholders in the future.

The lack of service standards is another reason for keeping tariffs low. Service standards indicate a minimum quality, which have to be delivered to the customers. However first discussions on introducing service standards in Egypt are done.

Besides the mentioned constraints there are also positive signs for implementing a costcovering tariff. Most important sign is the political will. The new legislation shows that there is the intention to change the situation in order to provide financially sustainable sanitation service. The newly established HCWW is a public company, which means it cannot request public funding. This issue sets the basis for a financially sustainable company, as it has to be operated in the most efficient way. The establishment of EWRA is also a sign of political will in order to overcome bureaucracy and a long list of decision makers. Finally the situation of Alexandria and to a broader extent of Egypt requires reforms because of the changing demographic and economical situation. Another positive sign towards a tariff adjustment is the affordability to pay. Average Egyptian household can easily afford to pay tariffs which cover O&M costs.

One of the two developed scenarios namely the second one could be a good solution for Alexandria in order to cover O&M costs. This tariff scenario would include major components of future national policies and it would also recognize the specific situation on Alexandria. Finally the assessment showed that it is possible to introduce a cost-covering sanitation tariff under the precondition that a tariff increase would occur gradually and that affordability to pay has to be respected.

First recommendation is to give sanitation and its financial sustainability an own separate importance. An example for that could be the National Sanitation Program "Programme National d'Assainissement – PNA" which is implemented in Morocco. The sanitation sector is important and big enough in order to be tackled separately. This would have positive impact on the environment in Alexandria and it could create also an economic instrument for job creation.

Regarding the questioned influence and independence of EWRA, it is recommended to involve other stakeholders in tariff adjustment process. The current situation seems that EWRA is dependant on the interest of MoHHUD. A solution could be to create a board of directors for EWRA were members of MoHHUD and the municipality are represented, this would strengthen the decisions and would make them more transparent. In Germany e.g. two parties, the municipal councillor and water and wastewater supplier, set tariffs. In this case two different interest groups have an influence on a tariff setting.

In order to rise the accountability and responsibility of users towards sanitation tariffs it is recommended to register all housing units in Alexandria at ASDCO. This would be a first step in order to implement the second proposed scenario, which is based on a minimum charge

paid by all housing units. All housing units whether they are occupied or not would contribute to occurred cost of an available service. This measure could be implemented by starting cooperation with the electricity company, which should have all the information on each housing unit in Alexandria. It could also be a start for a more extensive joint venture between all network providers in Alexandria in order to make use of economies of scale. An example could be to collect all bills together or to establish one agency, which would be responsible for billing of network services. Such a practice would enormously reduce the administration cost of utilities. In Morocco this is already practiced where ONEP and ONE (an electricity utility) are collecting the water and electricity bills together.

Another major recommendation is to implement the mentioned service standards as soon as possible. It would strengthen the contractual responsibility for paying water and wastewater tariffs. Moreover it is recommended to start awareness campaigns and to inform the population on the sanitation and its difficult processes. This would also give sanitation services a higher value. Industrial users should be priced properly according to their pollution load. The polluter pays principle is already implemented in Germany, Morocco and in other Arabic countries.