PERFORMANCE INDICATORS AS A TOOL FOR ASSESSMENT OF THE MOST SUITABLE MEAN FOR POTABLE WATER AND SANITARY DRAINAGE PROVISION

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Providing infrastructure services to meet the demands of business, households, and other users is one of the major challenges of economic development. The availability of infrastructure has increased significantly in developing countries over the past several decades. In many cases, however the full benefits of past present and on going investments are not being realized, resulting in serious waste of resources and lost economic opportunities. This outcome is frequently caused by insufficient institutional arrangements for providing infrastructure service.

While the special technical and economical characteristics of infrastructure especially water and sewage give government an essential role in its provision, control, supervision, setting rules, codes and standards. Recent changes in thinking and technology have revealed increase scope of commercial principles in infrastructure provision.

While the main commercial principle is profitability in the provision of market good, to reach profitability other principles are inherent such as efficient operation and production, adequate maintenance, price setting, possibilities of exclusion, financial efficiency, and reliability of supply.

As economic changes is now an international trend that has affected all aspects of our life; new trends of governmental framework reform as well as private sector participation in the provision of many goods that used to be provided by the government is on going. Thus there is a growing trend towards turning infrastructure into being conceived as a “service industry” providing goods that meet customers’ demands and that customers should pay for the goods they receive. This also leads to public private participation in the provision of service The basis of PPP s is that through sharing roles , responsibilities, risks, expertise and resources between public and private partners, better services, facilities and development outputs can be achieved for communities and consumers than local governments attempting to do so on its own. It is important to note that there are a lot of forms of PPP’s starting from corporatisation, management contracts, leasing, joint ventures, concession contracts until complete or full privatization.

The decision makers are left with no tools to help them assess the most suitable mean to provide the service. That is should they sell, lease, offer the private sector concession or BOT. To reach the best decision they must have performance evaluation indicators that they could compare with other national or international entities providing the same service .Thus they could evaluate the assets under consideration for private participation and which component of the provision they could enter into contract with the private sector to carry.

These new trends of commercial orientation contrast sharply with the situation in Egypt with its infrastructure provision agencies and authorities, which suffer from multiple or conflicting objectives also inadequate accounting for costs or financial risk. There is little emphasis on revenues collected or cost recovery measures as well as the quality of service delivered. Managers have little motivation to satisfy customers, they also lack indicators of performance and achievements. As governmental provision agencies they have no incentive to achieve a reasonable return on assets through efficient operation, maintenance and future planning.

This research attempts to present the performance indictors as tools that can be used to reach the most suitable mean to attract the private sector to participate in the finance, management, operation and maintenance of potable water and sanitary drainage sector.

There are at least four forms of performance indicators; the first is the implementation indicator: this is the simplest form of monitoring it is a sort of regular review of the progress of work, what has been implemented compared to what has been planned. This is most favorable to governments to indicate the progress of work. And this is what is most available in almost all organizations. The second is impact monitoring that is the impact of the implementation of the plan on the achievement of the plan objectives such as the implementation of new water treatment plant on the per capita consumption of water. The third mean of evaluation is the satisfaction of the clients or inhabitants on what is being achieved and provided. The forth mean is through quantitative performance indicators this is the most objective mean of monitoring and evaluation. Internationally there are many performance indictors such as:

Service coverage area
- Percent area served with water supply
- Percent area served with sanitary drainage

Service coverage-population
- Percent of population serviced with water supply
- Percent of population serviced with sanitary drainage
- Per capita supply of net water available

Unaccounted for water
- Unaccounted water as percent of total installed capacity
- (volume invoiced / volume produced)
- water supply free as percent of total water produced
- (volume through public taps/volume produced)

Percent of connections with working consumer meters as percent of total connections

Managerial indicators that evaluate institutional efficiency such as:

Staff productivity
- No. of connection serviced by one employee
- No. of population serviced by one employee

Performance indicator includes some deep technical indicators such as:

Capacity utilization

Actual water treated as percent of total installed capacity

Installed capacity of sewage treatment as percent of installed capacity of water treatment /produced

Actual sewage treated as percent of total installed capacity

Usage of production components

How much electricity is used to treat a unit of water or sewage

Chemicals (Chlorine or bleaching powder) used /unit of water

Reliability of service delivery

Interruptions in water supply as percent of hours of service

Complaints attended for water supply or sanitation as percent of total complaints

Also of the most important indicators are the financial performance indicators they include

Financial performance

Per capita O& M costs of water supply

Per capita O& M costs of sanitary drainage

Operation revenue/expenses[1]

This paper will depend on presenting the results of a study undertaken by TRHUD to evaluate three economic organizations for potable water and Sanitary Drainage in Egypt; they are Sharkia, Fayoum and Aswan.[2]

The research chose three out of seven economic organizations for potable water and sanitary drainage that were created in 1995 to evaluate their performance after five years of their official creation by presidential decree no. 281 for 1995. The research chose this time to evaluate their performance due to two main reasons:

The First is that the national government in its strategy of structural reform will create other economic organization all around Egypt to provide water and sanitary drainage. Thus awareness of mistakes and opportunities ahead is of great necessity.

The Second reason is that there is also a new trend of public private participation is now being introduced to potable water and sanitary drainage sector in the provision of service whether through concessions, BOT or other contracts or special identified tasks set for the private sector to perform. From the point of view of the private sector it is necessary for him to know the organization's performance indicators before entering into such contracts with public agencies. This is to assess also liabilities and points of weakness and strength so he can access what is it worth and whether the performance

[1]Training manual for public private participation in the management of municipal infrastructure(operation and maintenance), I HS and U.P. Academy of administration, Nainital, India, 1998

[2]A comparative evaluation of the performance of three economic organizations for potable water and sanitary drainage; Sharkia, Fayoum and Aswan, TRHUD, 2000

problems can be treated and measured to promote successful profitable performance.

And also the government knowing each agency or authorities performance indicators can chose among options on the basis of the economic, institutional and technical aspects of the contract with private sector.

It is of importance to indicate that there were a lot of reasons that were behind the enactment of this decree that changed the status of the local entities providing infrastructure from local governmental subdivisions into semi-private or semi-public organizations. Among these reasons the poor performance of these entities and the lack of government resources needed to continue providing the service within the same framework And so the decision makers though that through changing the institutional framework of the provision of service can be more efficient and less dependent on central government. In the decree a lot of roles and responsibilities were given to the new organizations but whether they have attempted to do so or not is one of the items of the comparative evaluation

To evaluate the performance of these 3 organizations the research had to plan, measure and compare different essential features or performance indicators but due to lack of updated data even in the organizations themselves. Thus the research team chose only some technical and institutional and financial performance indicators that were available in the three organizations.

It is important to note that for any operation there are cost components such as material, labor & overheads. These can also be classified into cost units for material there is the price of each unit and the usage .For the labor there is the rate and efficiency, as for overheads it is considered an indirect cost. And as all these components especially overheads costs is a result of managerial decisions. Thus it is common to assume that high cost of production is a sign of inefficiency.

And so it is important to have data on different costs components as they can also be translated into cost centers. A cost center is a division, part, or function of the whole enterprise where a responsibility can be meaningfully located.

An agency that finds some cost center that is insufficient may contract others to do that or may look for other efficient options to perform the same function. These cost components are highly connected to performance indicators. Performance indicator should be available on each plant and each sector. For example in a waste water treatment plant the daily amounts of water received by the plant, the BOD influent and effluent, the TSS and the percent of water treatment, the maintenance working hours (man/ hour) and monthly costs must be recorded. An agency that treats water using more electricity or other components than standard rates may have to look into its machines or system itself that needs maintenance or even change. For in the long run it might be cheaper to turn to other production options. Sampling and testing should be done on regular basis and results monitored and analyzed any change in performance must be studied and dealt with in the most effective.

In this part of the paper Performance Indicator of the three organizations will be illustrated. The beginning will always be service coverage area or service coverage population for this is important to evaluate and plan for the future what is needed to deliver the service for the whole community .The percent of connections (customers) as a percent of number of households, is comparatively high in Aswan about 84% then Sharkia 56% then Fayoum with about 59%. On the other hand, the number of employees for each connection is very high in Aswan 20 employees/1000 connection almost equal in Sharkia and Fayoum 10 employees /1000 connection. This is relatively very high ratio international it is about 2-4 employees per connection. This performance indicator is also linked to two other indicators, the percent of each employee from annual revenue it is about 5000 L.E./ employee in Aswan, 6200L.E./employee in Fayoum and 6600 L.E./employee in Sharkia.

Another important performance indicator is the percent of unaccounted for water to produced water it is 65% in Sharkia and around 55% in Aswan and Fayoum. With this very high percent of unaccounted for water no private sector will be willing to buy a company that sells only half or less of what it produces. A company as such thus relies on half the customers to pay for twice what they use. Moreover no customer if knowing such information will be willing to pay extra bills.

The percent of the labor costs as compared to total costs of provision it is 8% in Aswan, 4% in Fayoum and 5% in Sharkia, still Aswan is very high due to number of employees.

Another performance indicator is the percent of operation and maintenance costs, total costs it is 59% in Fayoum and 28 % in Aswan and 15% in Sharkia. This could be translated into indicating very poor maintenance in Sharkia and Aswan, better maintenance in Fayoum. Thus assets in Fayoum are probably in better conditions and should have longer life time.

As to monetary indicators and budgets it is interesting to note that while these new entities were created under the name economic organizations and were supposed to have an economic states depending on their own resources and revenue to cover their costs they were not given enough independence to do so. Thus they are all suffering from budget deficit in Aswan the budget deficit is the highest about 50% then Fayoum with 48% and 20% for Sharkia. Private sector evaluating an organization with a deficit of such high amounts will put that in mind when evaluating the assets.

The above mentioned indicators as well as other related indicator are illustrated in the following graphs no. 1-10.

Through the above mentioned performance indicators the status of infrastructure can be identified depending on its performance. This distinction is of importance for setting investment plan, deciding on kind of public private participation area and type of contract. The infrastructure could be divided into four categories according to operation and maintenance of facilities:

A- Infrastructure which receives adequate operation and maintenance service and thus brings the expected levels of performance

indicators and whose assets are expected to last they have reached their technical lifetime

B- Infrastructure which receives minimal O&M services thus performance is at minimal level and whose assets still functions without many problems but whose technical life is endangered, and will involve higher maintenance costs in the long run.

C- infrastructure which is badly serviced, resulting in serious urban problems in which case increased O&M services and loss of assets can be expected in the absence of immediate repair.

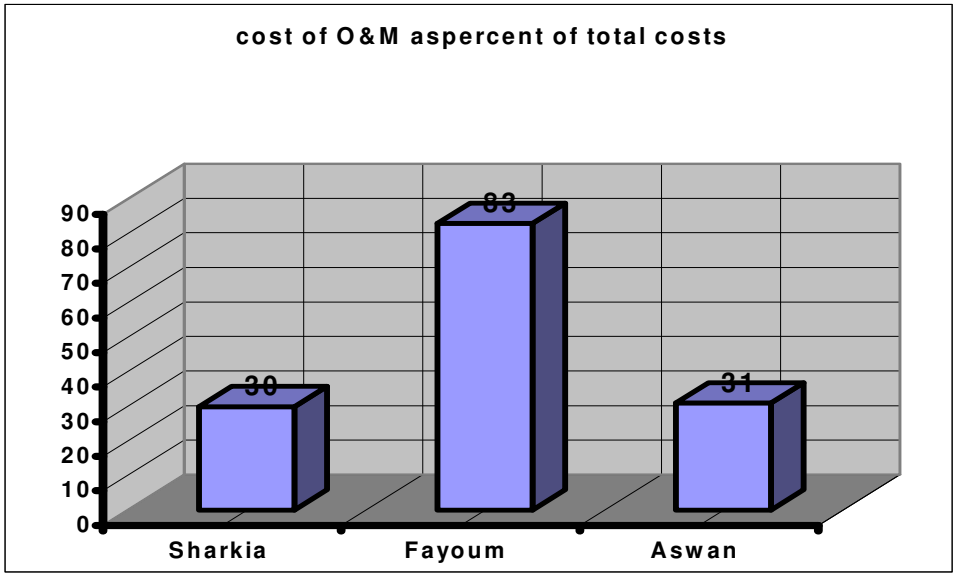
D- Infrastructure which is almost non-functioning and whose assets are beyond repair and have to be considered as written off. Rehabilitation or replacement is the only solution.

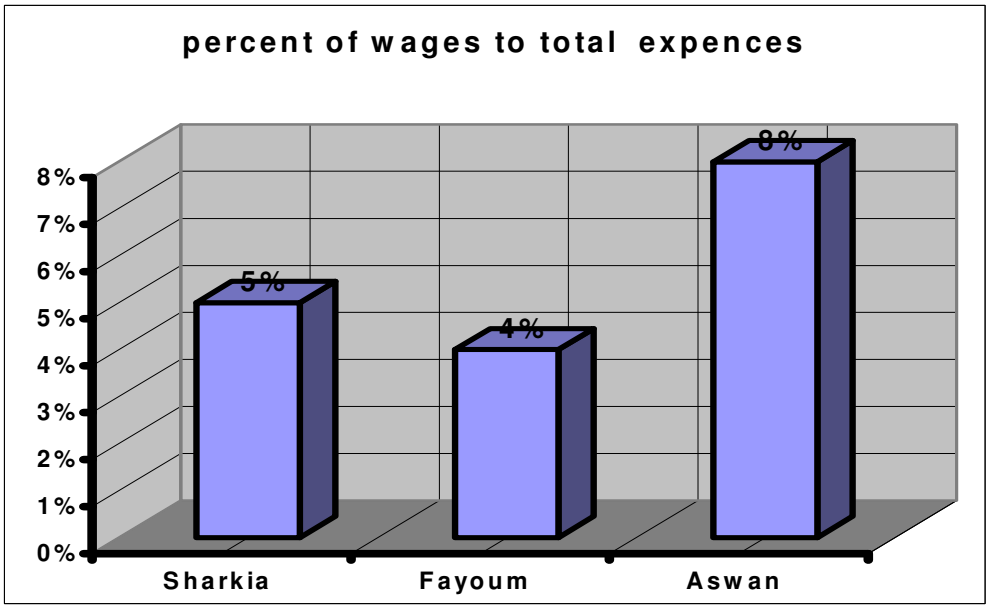
It is of importance to note that there is always a gap between required operation and maintenance service expenditure and attained or available investment especially in Egypt were a large percent of the budget is spent on salaries and minimal efforts are exerted towards cost recovery. Thus each year there is always a need for central government financial aid not only for new investment but also for operation and maintenance.

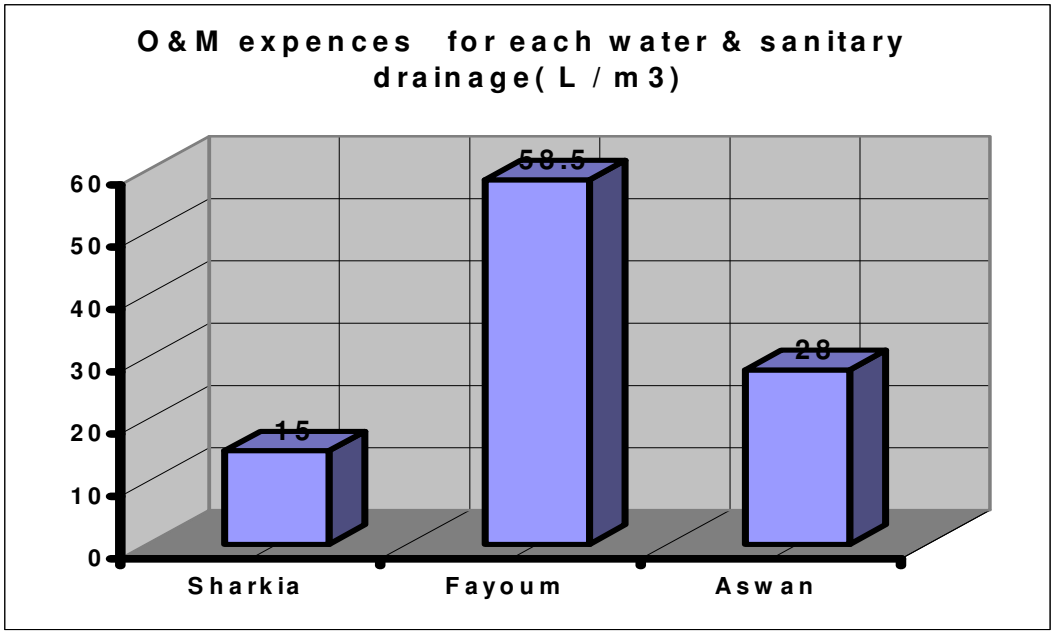
Also, through the performance indicators that deal with the financial status of the organization especially the budget deficit and its development since the change into semi-public status the organization can assess the areas that need to work more efficiently.

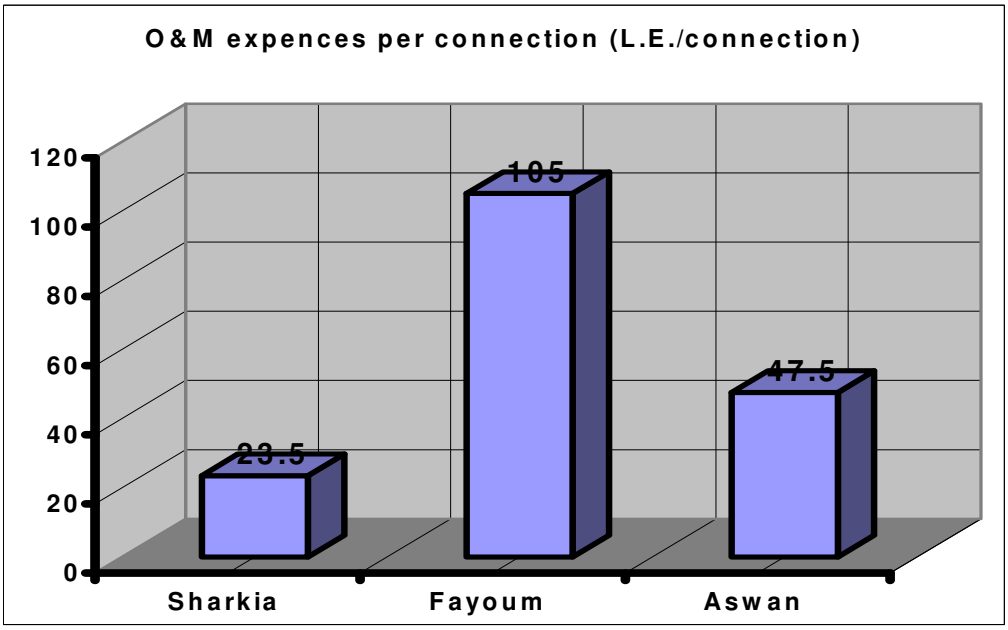
And so this research recommend that before introducing new economic organizations as a mean for turning them into semi-private entities as a step towards complete privatization their performance indicators must be available as well as studying the management problems that are really the reason behind the poor performance. In the opinion of the research team the main problem lies in not given these entities the freedom to choose the employees, give them work incentives, as well as their freedom to plan for the future needs and price setting.

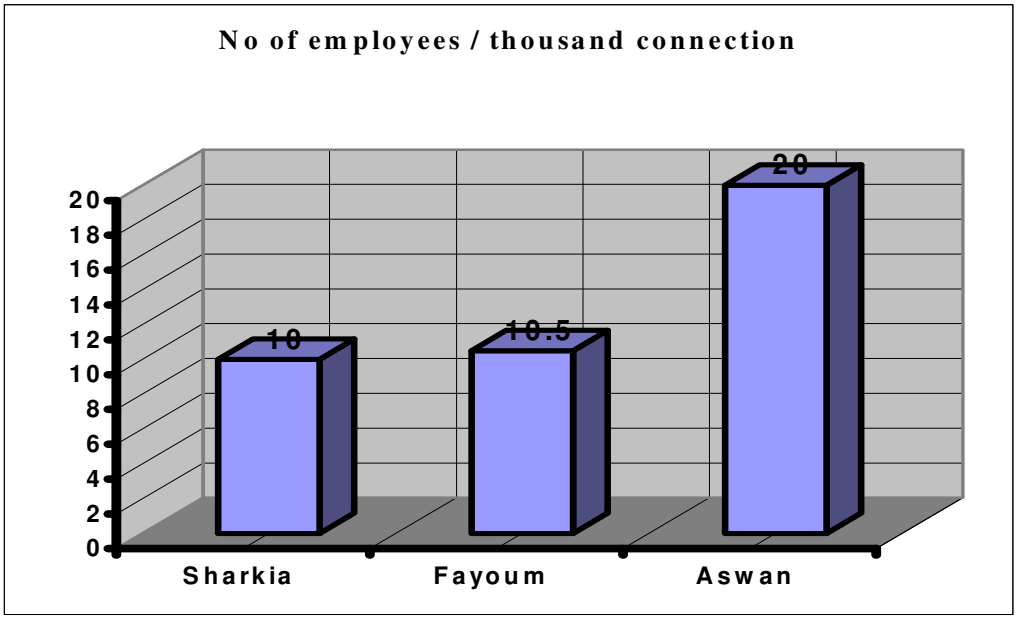
Also, the research recommends that before trying to attract the private sector to enter into any kind of contracts to help in the implementation of a certain project or part of the provision process the organization itself must have clear information on the different parts performance indicators .Only if such information is available can the chairman of any organization be able to asses his needs area of weakness and strength, opportunities and threat within the company or in the environment as a whole.

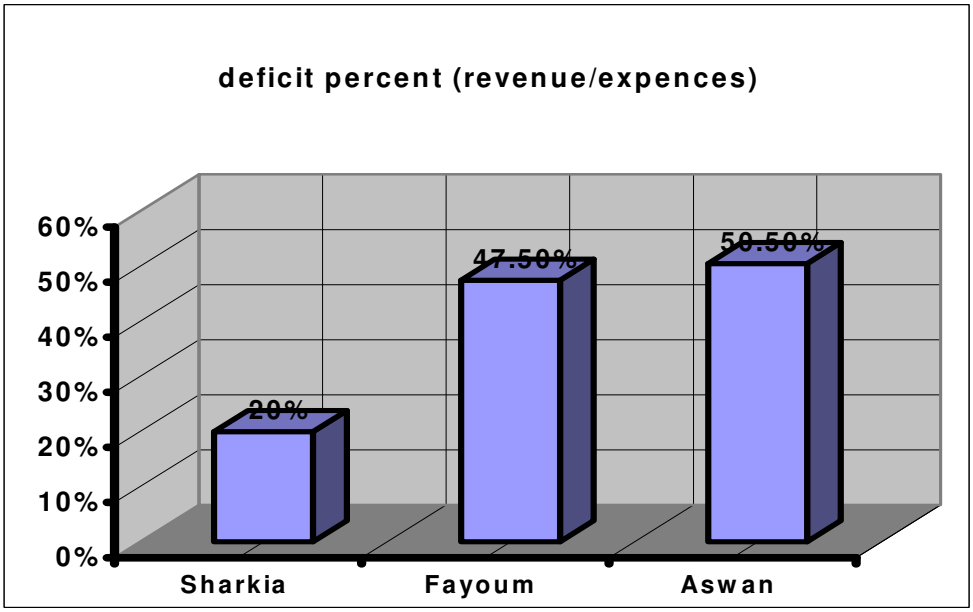

cost of O&M aspercent of total costs
90
80
70
60
50
40
30
20
10
0
30
83
31
Sharkia
Fayoum
Aswan

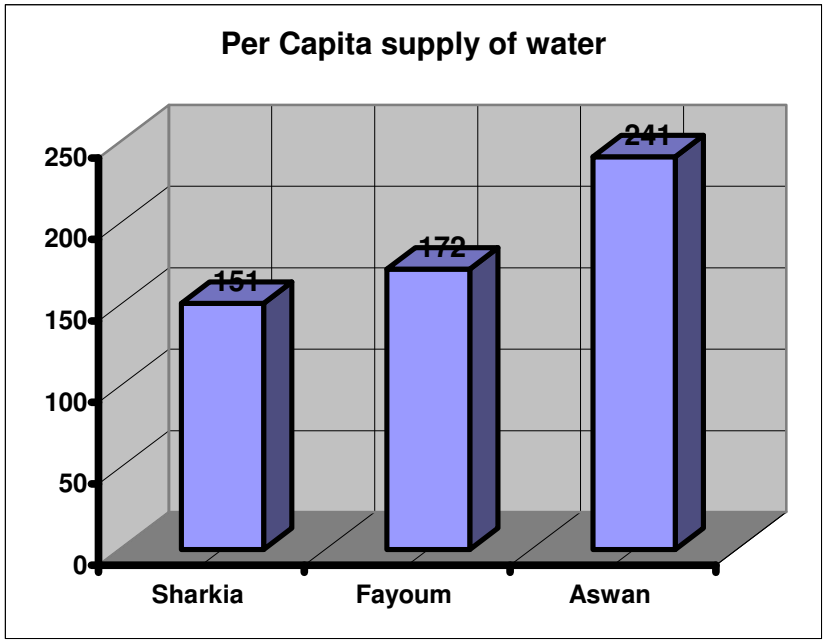

percent of wages to total expences
8%
7%
6%
5%
4%
3%
2%
1%
0%
5%
4%
8%
Sharkia
Fayoum
Aswan

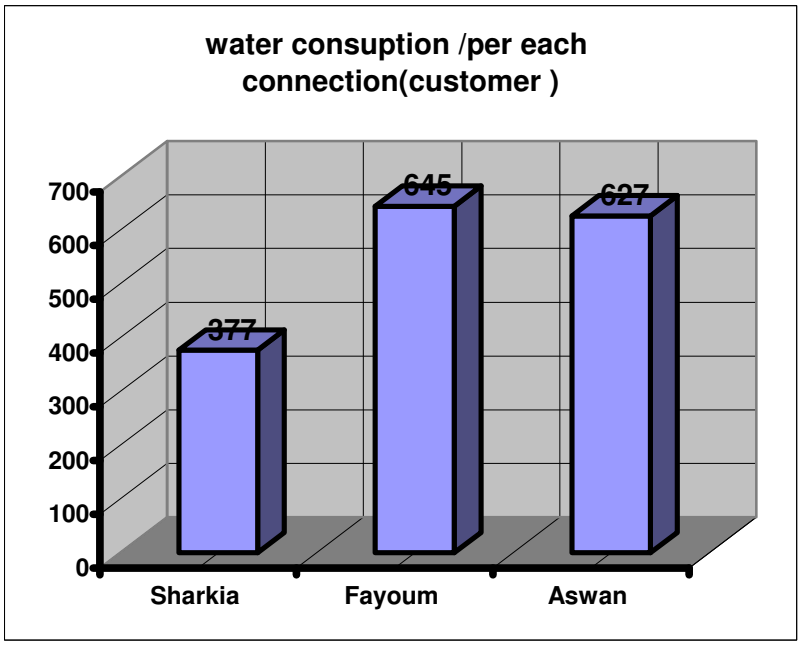

O&M expences for each water & sanitary drainage(L / m3)
60
50
40
30
20
10
0
15
58.5
28
Sharkia
Fayoum
Aswan

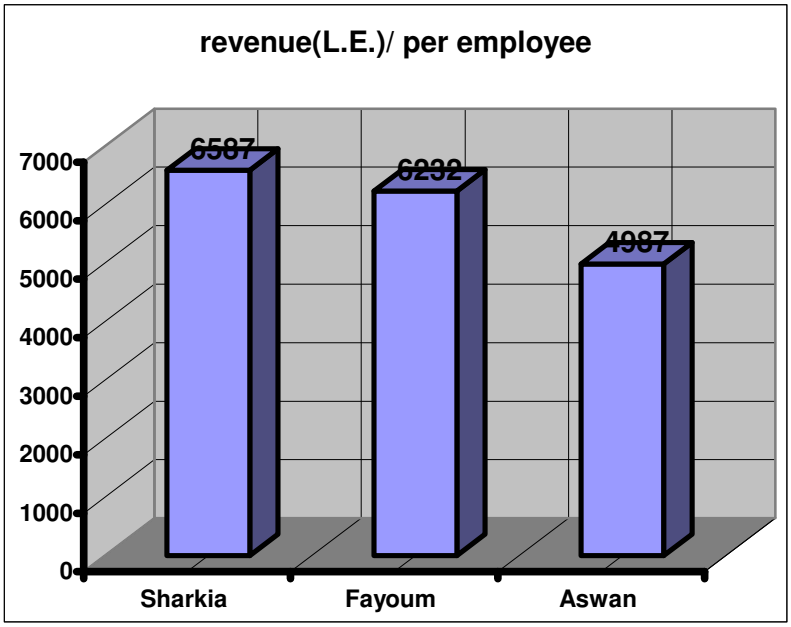

O&M expences per connection (L.E./connection)
120
100
80
60
40
20
0
23.5
105
47.5
Sharkia
Fayoum
Aswan

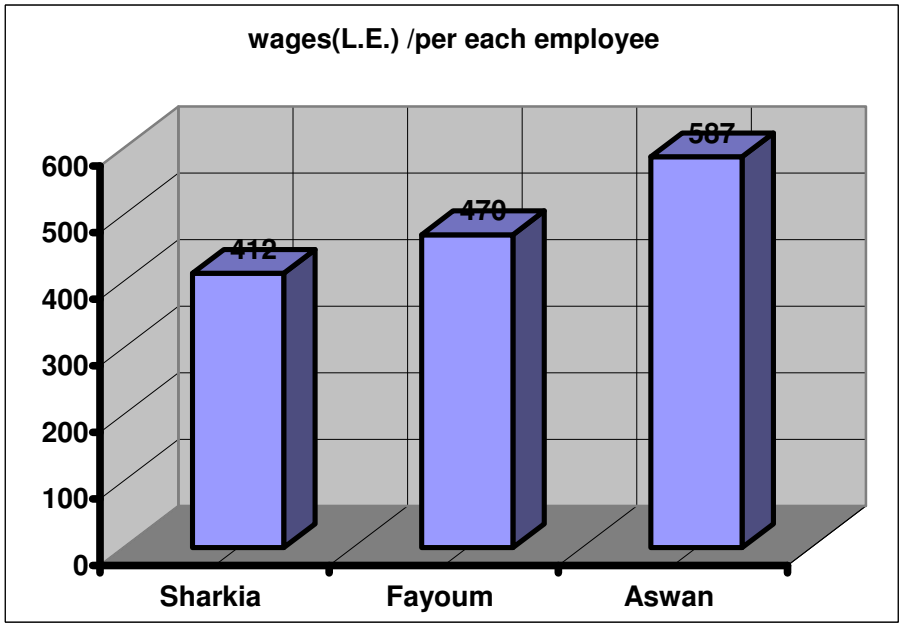

No of employees / thousand connection
20
18
16
14
12
10
8
6
4
2
0
10
10.5
20
Sharkia
Fayoum
Aswan


deficit percent (revenue/expences)
60%
50%
40%
30%
20%
10%
0%
20%
47.50%
50.50%
Sharkia
Fayoum
Aswan


Per Capita supply of water
250
200
150
100
50
0
151
172
241
Sharkia
Fayoum
Aswan


water consuption /per each connection(customer)
700
600
500
400
300
200
100
0
377
645
627
Sharkia
Fayoum
Aswan


revenue(L.E.)/ per employee
7000
6000
5000
4000
3000
2000
1000
0
6587
6232
4987
Sharkia
Fayoum
Aswan


wages(L.E.) /per each employee
600
500
400
300
200
100
0
412
470
587
Sharkia
Fayoum
Aswan