

# **Institutional Mapping and Water Governance Analysis in the City of Alexandria**



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## **Introduction**

Despite its importance and its widespread employment in policymaking practice, the theoretical and epistemic foundations of institutional mapping have not been elaborated and its legitimacy is yet to be fully granted by the academic community.

This report consists of an institutional map and analysis defining the governance structures and politics of urban water management in Alexandria. The report will identify where powers and funding reside for each possible intervention strategy, with particular reference to the elaboration of the proposed Integrated Urban Water Management (IUWM) plan. It will also present a number of recommendations for action with regard to institutional arrangements in Alexandria. The report will build on relevant work carried out or being developed under the SWITCH project (e.g. scoping visit, stakeholder analysis, Alexandria Learning Alliance (LA) progress report, Alexandria Demonstration social inclusion baseline study). More precisely, it will expand the available knowledge basis by referring to the existing official documentation (e.g. National Water Resources Plan 2005-2017), as well as a range of primary and secondary sources of empirical evidence. Primary sources might for example include interviews of relevant stakeholders including members of the Learning Alliance. Secondary sources refer to published articles and reports and other external documents containing factual information.

The term "Governance" relates to decisions that define expectations, grant power, or verify performance. It consists either of a separate process or of a specific part of management or leadership processes. SWITCH has a big role in assuring the application of fair governance in the Alexandria water sector. Fair governance implies that mechanisms function in a way that allows the executives to respect the rights and interests of the stakeholders, in a spirit of democracy. Therefore, the relevance of the LA that was assembled by SWITCH is particularly obvious.

Over the last decade, several efforts have been conducted in the research and international development community in order to assess and measure the quality of governance in different sectors in many countries around the world. One of these efforts to create an internationally comparable measure of governance is the Worldwide Governance Indicators project, developed by members of the World Bank and the World Bank Institute.

There is no evidence of any sources of information on governance in the Alexandria water sector other than the SWITCH project. However, no measures for Governance are currently applied.

## **IUWM and Egyptian NWRP**

The main expected output at the end of the SWITCH project is an Integrated Urban Water Management plan. Such plan will be highly influenced by the institutional mapping of the water sector and its success will depend largely on how the main key players in the sector believe in it. It is extremely important that any progressing plan considers previously developed plans. An IUWM plan is in fact an Integrated Water Resources Management (IWRM) on the city level.

Egypt met the 2005 Integrated Water Resources Management (IWRM) specified target by preparing a very comprehensive National Water Resources Plan (NWRP) through a multi-stakeholder and participatory approach under the lead of the Ministry of Water Resources & Irrigation.

Formerly called the Ministry of Irrigation and the Ministry of Public Works and Water Resources, MWRI is responsible for national water resources and is the only body to authorize use of water from the Nile, canals, drains, and groundwater sources. The ministry also has control over works built to discharge water into canals, drains, and the Nile. MPWWR is authorized to assess penalties if its orders are not obeyed.

NWRP was carried out by the Ministry of Water Resources and Irrigation (MWRI) with the support of the Government of the Netherlands. The main objective of the plan is safeguarding Egypt's future water needs. The other objectives are as follows:

- To increase economic growth to 7.6% for the period 2003-2017
- To increase per-capita GDP to \$4,100 in 2017
- To increase inhabited area from 5.5% to 25% by 2017
- To expand agriculture development by 3.4 million feddans by 2017 including:
  - 220,000 fed in the East Delta
  - 400,000 fed. North Sinai
  - 500,000 fed South Egypt
  - 447,000 fed Oases on groundwater
- Protecting the Nile & water resources from pollution
- Promotion of integrated pest control and limitation on the use of agro-chemicals
- Extension of sewage networks and wastewater treatment plants
- Promotion of water conservation in domestic, agriculture and industry uses

The previous objectives are all somehow water related, there are also some policy objectives that revolve around supporting the socio-economic development of Egypt on the basis of sustainable management of water resources while protecting the natural environment as follows:

- Supply drinking water and provision of sanitation services according to standards and targets on a cost recovery basis while ensuring the right to basic requirements to all people
- Supply of water for industrial purposes and provision of sewage treatment facilities on a cost recovery basis
- Supply of water for irrigation based on a participatory approach and cost recovery of O & M
- Protection of the water system from pollution, based on a polluter-pays principle and the restoration of water systems, particularly in the ecologically important areas

Moreover, there are some strategic measures involved in NWRP such as:

- Development of new water resources and cooperation with the Nile Basin riparian countries
- Making better use of the available water resources

- Protection of public health and environment
- General Institution, Legal, & Financial Measures

The plan is actually implemented by a national executive committee that comprises five other ministries beside MWRI. The names of these ministries and a brief description of their roles are presented hereby:

**1) The Ministry of Housing:**

- Increasing the amount of treated wastewater.
- Decreasing losses in water supply networks.
- Cost recovery of water supply services.
- Spreading public awareness about water preservation.

**2) The Ministry of Agriculture:**

- Promoting Environment-friendly agricultural techniques.
- Regulating the use of organic fertilizers.
- Increasing rainfall harvesting along the northern coast.
- Studying the possibility of cultivating high salinity enduring crops.

**3) The Ministry of environmental affairs:**

- Spreading public awareness about water preservation. .
- Spreading public awareness about water quality preservation.
- Observing and reporting industrial pollution.

**4) The Ministry of Health:**

- Protecting groundwater from pollution.
- Allowing a higher degree of salinity in irrigation water.
- Setting water quality criteria.
- Continuing family planning campaigns.

**5) The Ministry of Industry:**

- Rewarding industries that treat their wastes.
- Promoting water saving technologies.
- Primary treatment of industrial wastes.
- Moving factories overlaying vital water ways.

NWRP also recognizes the roles of other entities including non governmental organizations, local and regional water councils, civil society and the private sector.

**Expected Results of the NWRP:**

By 2017, the following achievements are expected:

- Agriculture Area will increase by 35%
- Increasing inhabited Area for more than 20% of Population
- Provide Safe Drinking water to 100% of the population
- Double access to Safe Sanitation from 30% to 60% of population
- A National Water Council will be established
- GDP will increase from 246 Billion LE in 1997 to 789 Billion LE
- Employment in Agriculture will increase from 5.01 to 7.30 m. person/year and in industry from 2.18 to 4.99 m. person/year
- Overall Water Use efficiency will increase from 70% to 77%
- Outflow to sinks will decrease from 16.3 to 12.5 BCM/year
- Unaccounted for losses in the Potable Water Supply will decrease from 34% to 25%

Table. 1 shows a comparison between the expected results with and without implementing NWRP with respect to many aspects.

<b>Business as Usual</b>	<b>NWRP</b>
<ul style="list-style-type: none"> <li>➤ Gross Ag Production Value: <b>35.76 BLE</b></li> <li>➤ Crop Intensity: <b>1.5</b></li> <li>➤ Net Value Production per feddan:<b>2,075 LE/fed</b></li> <li>➤ Export / Import Value: <b>0.12</b></li> <li>➤ Navigation Bottlenecks: <b>144</b></li> <li>➤ Employment in Agriculture: <b>6.24 m. persons/year</b></li> <li>➤ Outflow to sinks: <b>17.6 BCM</b></li> <li>➤ Overall Nile Water Use Efficiency: <b>67%</b></li> <li>➤ Agriculture supply/demand ratio: <b>0.8</b></li> <li>➤ Ag. Water availability: <b>3,285 m3/fed/year</b></li> <li>➤ UFW Losses: <b>34%</b></li> <li>➤ Potable supply/demand ratio: <b>0.76</b></li> <li>➤ E-coli Standard violation: <b>121</b></li> <li>➤ Condition in Bardawil: <b>(-)</b></li> <li>➤ Condition in Coastal lakes: <b>(-)</b></li> </ul>	<ul style="list-style-type: none"> <li>➤ Gross Ag Production Value: <b>38.50 BLE</b></li> <li>➤ Crop Intensity: <b>1.7</b></li> <li>➤ Net Value Production per feddan:<b>2,153 LE/fed</b></li> <li>➤ Export / Import Value: <b>0.20</b></li> <li>➤ Navigation Bottlenecks: <b>0</b></li> <li>➤ Employment in Agriculture: <b>7.3 m. persons/year</b></li> <li>➤ Outflow to sinks: <b>12.5 BCM</b></li> <li>➤ Overall Nile Water Use Efficiency: <b>77%</b></li> <li>➤ Agriculture supply/demand ratio: <b>0.92</b></li> <li>➤ Ag. Water availability: <b>3,866 m3/fed/year</b></li> <li>➤ UFW Losses: <b>25%</b></li> <li>➤ Potable supply/demand ratio: <b>1.0</b></li> <li>➤ E-coli Standard violation: <b>110</b></li> <li>➤ Condition in Bardawil: <b>(+)</b></li> <li>➤ Condition in Coastal lakes: <b>(0)</b></li> </ul>

**Table. 1 Expected results comparison.**

## Official Laws/ Decrees

In November 2005, an official presidential decree was declared. The decree stated that all informal settlements must be provided with water supply.

The previous decree is of particular relevance to the SWITCH project, as an informal settlement was the scope of the SWITCH demonstration project.

One fifth of Alexandria's population live in rural areas. These areas have a rural and Bedouin societal structure which contributes to the large rural life style in El Ameryah, Sharrk, Wassat, El Montazah and Borg El Arab districts.

By 1996, there were about 36 informal areas, covering a total area of about 34.11 km<sup>2</sup>. Such areas were occupied by about 848062 persons, representing about one-quarter of the total population of Alexandria governorate. This high concentration of population has led to an overall population density of about 24864 person/km<sup>2</sup>.

By 2005 there have been about 50 informal areas in Alexandria covering an area of 7830.3 acres, accounting for about 9.7% of the total area of Alexandria governorate. These areas accommodate as much as 1.4 million inhabitants, representing 41.8% of the governorate total population. Such informality could limit the chances of residents in obtaining basic infrastructure and services. It was suggested accordingly that prohibitions of informal areas development on agricultural land did not work, which meant that current trends would continue as long as alternatives are not offered to informal land and housing markets.

Maawa Alsayadeen (Fishermen's Village) has been selected as the demonstration site by both the governorate of Alexandria and SWITCH experts. It is an unplanned area, with narrow streets. Tenure arrangements for households in these subdivisions are unclear and there is also a small area of illegal housing. SWITCH will focus on facilitating planning of upgraded basic infrastructure (water, sewerage and drainage); test some of the IUWM interventions, and present a model of how to implement IUWM in informal settlements for what may be considered the village/ city of the future.

From focus group discussions that were organized through the SWITCH Learning Alliance (LA), the main problem with the water supply is the fact that many households remain without connections, due to the governor's decree preventing further connections. The governor's decree has aroused some controversy as it seems to be contradicting to the presidential decree. An explanation that was given by an Alexandria governorate official helped in decreasing the confusion. He claims that the governor's decree is applicable on household that were established after the presidential decree in November 2005. According to that explanation, it could be assumed that all households in Maawa alsayadeen that existed prior to November 2005 are currently covered with water supply and the governor's decree aimed to prevent further informal settlements.

The governor's decree may be of great significance to the SWITCH project that targets Maawa Alsayadeen as a demo site and plans to increase the metered connections in it, it is important to assure that future interventions go in line with the overall policy of the governorate.

The integration between different ministries has been well assured and reflected in various national decrees and laws. It dates back to 1966 when a presidential decree

(2703, 1966) stating that the Ministry of Health must form a high water committee was issued. It aimed at enhancing the role of the Ministry of Health in checking all health issues related to water. The committee included members from the Ministry of Agriculture, the Ministry of Irrigation, and the Armed forces. The decree has assigned many tasks to the new committee, including setting standards for raw water treatment and delivery.

Law 48 for the year 1982 has defined all water resources that can be utilized for drinking purposes. It was preceded by Law 27 for the year 1978. Article 2 of that law has granted sole authority to the Ministry of Housing for granting permits to individuals/ entities wishing to use a particular water source for the purpose of delivering drinking water for human use. Article 6 of the same law has incorporated the role of the Ministry of health in deciding whether particular canal intakes are appropriate for the purpose of delivering drinking water.

In 1980, the Minister of Housing issued an important decree concerning ground and elevated water reservoirs. Decree 111 has specified certain requirements in such reservoirs including being covered so as to prevent the entrance of insects and having openings for cleaning and excess release. The decree also stated that considerations must be made to avoid the seepage of groundwater and drainage water to ground reservoirs. The decree also included a more specific description of “public water resources” which is totally isolated from sources of pollution.

On the governorate scale, governors have always contributed positively to the water sector by issuing relevant decrees. Egypt has seen a significant increase in urbanization in the seventies that was accompanied with a huge preference towards vertical expansion, which introduced a new problem; in many buildings water did not reach higher levels of buildings. The governor of Cairo issued decree 897 for the year 1972 that stated that all individuals or entities seeking building permits for buildings 14 meters or higher than the street level must install water pumps and elevated reservoirs to assure the delivery of water to the higher building level. The Governor of Alexandria issued a similar decree in 1979.

The Governor of Cairo issued decree 26 for the year 1978; the decree included a comprehensive list of water users categories with an appropriate tariff system for each category. That decree was in line with the decree issued by the Minister of rural affairs in 1961 with many additions. It is worth mentioning that the 1961 decree has put a huge responsibility on property owners to install appropriate water connections.

A new law for water supply and wastewater has been drafted in September 2009, it also incorporate the roles of all previously listed ministries and entities, in addition to the Ministry of Economic Development, the Ministry of International Cooperation, and the Ministry of local Development.

## **Wastewater policies and Decrees:**

The following is a brief overview of all laws/ decrees codes related to Wastewater:

- Law 93/1962 establishes Standards for wastewater discharge into the sewer system.

- Law 27/1978 regulates public sources of drinking water. It instructs and empowers the MHP to set standards for potable water.
- Law 48/1982 regulates the discharge of waste and wastewater into the Nile and its waterways and sets standards for the quality of effluents. The law establishes the responsibilities of the MWRI and the Ministry of Health in monitoring the quality of effluents discharged into the Nile River (and its associated drainage system, lakes and groundwater) to ensure that water quality standards are met. Industrial establishments are required to obtain pollution discharge licenses. A bond is required with the license application and a fee of L.E. 0.1 (one piastre) per cubic meter of effluent is levied according to Article 82 of the implementing regulations. Under this Law, the Ministry of Health has the obligation to carry out periodic sampling and analysis of wastewater and waste discharge from establishments that are licensed to discharge to waterways. (Hellaly, 2009)
- Decree No. 649/1962 of the Minister of Housing issues the executive regulations of Law 93/1962. It specifies regulatory standards for wastewater disposal. It was updated in 1989 by Decree No. 9/1989 in which a distinction was made between wastewater disposal on sandy soils and clay silt soils. Most prominent conditions included that wastewater treatment plants should be located more than three kilometres from the nearest residential area. Primary treatment was set as a minimum treatment level required before final discharge (Hellaly, 2009).
- Reuse of effluent in the irrigation of vegetables, fruits or any other crops eaten uncooked is strictly prohibited. The same restriction is imposed on grazing of animals or milking cattle on the fields irrigated with wastewater. In 1995 an amendment was made by both the Ministry of Irrigation and the Ministry of Agriculture and approved by the Ministry of Health. It has been issued by the Minister of Housing decree No 44/2000. This amendment determined the minimum degree required for wastewater treatment for the various reuse aspects (Hellaly, 2009).
- A code of practice for reuse is now prepared and it is about to be published

## **Water Resources Management in Alexandria:**

### **History**

Water resources in Egypt are becoming scarce. Surface-water resources originating from the Nile are now fully exploited, while groundwater sources are being brought into full production. Egypt is facing increasing water needs, demanded by a rapidly growing population, by increased urbanization, by higher standards of living and by an agricultural policy which emphasizes expanded production in order to feed the growing population. Alexandria is no exception. The Nile River is currently the sole source for urban water.

Improved planning and management procedures to allocate and use water are key measures generally prescribed to make the optimum use of available water.

Satisfying future demands in Egypt depends on better utilization and efficient use of present water resources. Optimal water management is an essential prerequisite for sustainable development of Egypt. The future may carry lots of risks if Egypt does not succeed in formulating and implementing a water policy which can match the limited freshwater supply with the increasing demand.

The main objective of water planning in Egypt has been to harness the highly fluctuating Nile flows, making them available for domestic and productive purposes. The means of fulfilling this objective have been to establish over-season storage, over-year storage, and flood control. These goals were basically achieved in 1971 following the inauguration of the Aswan High Dam (AHD).

Even though irrigation has taken place in the Nile Valley for nearly 5000 years, it is only in modern times - starting around 1850 - that the erection of water control structures such as barrages, canals, weirs was begun. Except for the Nile itself, every bit of the Egyptian water conveyance system is man-made and thus an expression of planned effort. The Egyptian irrigation system is tremendous in size and complexity. It consists of the Aswan High Dam, eight main barrages, approximately 30,000 km of public canals, 17,000 km. of public drains, 80,000 km. of private canals (mesqas) and farm drains, 450,000 private water-lifting devices (sakias or pumps), 22,000 public water-control structures, and 670 large public pumping stations for irrigation. Throughout this system, approximately 59 billion m<sup>3</sup> of water are distributed annually, not only for cultivated land, but also for municipal and industrial use, for generation of hydro-electricity and for the navigation of freighters and tourist boats on the Nile.

In Egypt, water planning is said to have started in 1933 when a policy was formulated to use the additional storage capacity made available by the second heightening of the old Aswan Dam and the Gabal El-Awlia Dam in Sudan. This plan introduced programmes for land-reclamation, conversion of some basin irrigation to perennial irrigation, and increases in the areas under rice cultivation. This policy was first revised in 1974 and again in 1975 when a new plan was drafted to accommodate the extra volumes of water resulting from the erection of the AHD.

In 1981, the first attempt was made to create a master plan for all water use in Egypt. It was carried out in the early 1980s under the auspices of UNDP and the International Bank for Reconstruction and Development (IBRD). The minister of irrigation at the time pointed out the objective to be achieved by this effort: "Because of this increasing competition for water and its limited availability, it was imperative to

introduce new scientific techniques, and to use mathematical models to design future plans for water development, and to ensure efficient use of this resource." The resulting plan, the "Arab Republic of Egypt Master Plan for Water Resources Development and Use" is, however, not a plan as such, but a first step in a process which is intended to lead to improved planning capabilities within the sector. The main objective of the plan is to implement planning tools (i.e., to establish data bases and build flow models) which will make it possible to plan the development and use of water resources with greater precision in the future and, thus, to guide investment decisions.

A prerequisite for good water planning is an administrative framework, which through management and monitoring, can provide information upwards through the system to feed into the planning exercise. A real planning capability, thus, entails a broad-based knowledge and a set of procedures and standards in the administration which are present at different hierarchical levels. The administrative framework established for water planning and management currently in use was outlined in NWRP 2017.

### **Institutional Framework and Actors Mapping:**

In addition to MWRI, a number of other ministries are also involved in water management and use, including agriculture and land reclamation, health, tourism, power, transportation, industry, and housing and reconstruction.

Two ministries, agriculture and land reclamation, and health, hold special responsibilities in their management role of water. The ministry of agriculture and land reclamation has special responsibilities because agriculture consumes around 85 per cent of the water. Prior to 1992, when cropping patterns were liberalized, the ministry of agriculture and land reclamation decided, in consultation with the ministry of industry, which crops were to be grown in which localities. Such planning was undertaken a year in advance. From this exercise, the ministry requested specific volumes of water to be delivered to each canal and each branch canal. Following the liberalization of the cropping pattern, however, it is not known precisely how the water allocation takes place. The ministry of health, which also holds special responsibilities, is authorized to close potable water supply works if the water produced does not meet standards. The ministry of health is further responsible for drafting quality standards for various water uses and for discharges of waste water.

To ensure co-ordination among agencies involved in water resources, three committees have been formed under the umbrella of MWRI. Two of them, the Supreme Committee of the Nile, headed by the minister of the MWRI, and the Co-coordinating Committee for Land Reclamation meet monthly to direct and review different developments plans, as well as to resolve conflicts between ministries. The third committee is called the Inter-Ministerial Committee on Water Planning (ICWP) and was established in 1977 as a part of the Master Water Plan project. ICWP is, as the name indicates a cross-ministerial committee with a strict focus on planning. It has been given the responsibility to set planning assumptions and review development plans.

Outside observers do not know much about how this administrative set-up actually functions. This, too, is a largely undocumented area. But a review of the literature on

the general state of Egyptian bureaucracy documents an organization legendary for its high degree of centralization and inefficiency, resulting from such problems as over-staffing, low salaries, and lack of incentives. In those respects, there are certainly differences among Egyptian ministries and the MWRI is generally known to be among the best functioning in Egypt. The literature suggests, however, that even the administrative set-up for water planning might be haunted by some of the problems mentioned above.

## **Water Services in Alexandria:**

The governorate of Alexandria is the leading executive and administrative body of Alexandria. It regulates the 2679 km<sup>2</sup> land of Alexandria and its 4 million people. The Ministry of Housing is responsible for all water supply and sanitation services in Alexandria. The Holding Company for waste water, which is under the Ministry of Housing, is the National Organization for Potable Water & Sanitary Drainage which covers water supply and sanitation to all the governorates in Egypt. It is the umbrella under which all local governorate drinking water and sanitation companies respond to. The Drinking Water and Sanitation sector is structured as follows:

### **Drinking Water and Sanitation Sector:**

After its reform in 2004, the sector comprised the following four main entities:

- Holding company for waste water (HCWW): Responsible for purification, transport and distribution of drinking water along with the safe disposal of wastes.
- The National committee for Drinking Water and Sanitation: Responsible for all the sector's investments outside the governorates of greater Cairo and Alexandria.
- The executive organization for drinking water and sanitation: Responsible for the sector's investments in the governorates of greater Cairo and Alexandria.
- The organizational committee for drinking water, sanitation and customer protection: Responsible for monitoring and supervision of all works related to the sector.

More focus will hereby be devoted to The Holding Company for Waste Water and the companies operating under its umbrella.

### **Holding Company for Waste Water (HCWW)**

The company was established under a presidential decree in 2004 within an initiative to reform the structure of the water supply and sanitation sector. It has a clear message which is providing an excellent water supply and sanitation service accompanied by the environmentally safe disposal of sanitation wastes.

The drinking water and sanitation sector reform included the involvement of the executive organization for drinking water and sanitation. Its role is to allocate, control and monitor funds and investments for all drinking water and sanitation

activities in the governorates of Greater Cairo( Cairo, Giza, and Qalyoubiya) and Alexandria.

There are a total of 21 companies under HCWW; most of these companies are in charge of both drinking water and sanitation in their own governorates, as well as new communities. The work force in all these companies is estimated to be 85,882.

Alexandria Governorate is one of two exceptions in Egypt where the drinking water company is separated from the sanitation company. The Alexandria Holding Company for Drinking Water is a sub-branch of the mother company, the Holding Company for Waste Water. It is responsible for water supply coverage within the Alexandria area, while, The Alexandria Holding Company for Sanitary Drainage is another sub-branch of the mother company, the Holding Company for Waste Water. It is responsible for sanitation services within the Alexandria area.

HCWW operates under a set of rules and approaches. The most important of them is the transparency approach followed in policies, revision and financial clearance. These approaches were also designed to be inclusive and communicative, which is implemented in the form of a customer service hotline and a public awareness campaign.

The company's policies are also coherent, integrative and considerate to all potential users. Specialized consultants have been appointed to design a strategic water sector plan for all governorates until the year 2037.

Finally, the policies are designed to be ethical and equitable. There is an ongoing research to decide the most appropriate water service tariff that satisfies the dual goal of making the service accessible for individuals with low incomes while preventing water losses resulting from individual irresponsible behavior. An ideal water tariff should not exceed 4% of any given household income.

The urgent drinking water plan was declared before the summer of 2008 according to a presidential decree. The plan aimed at providing all uncovered area with 24 hours a day access to drinking water. The expenses reached 3 billion LE.

### **Alexandria 2037 Water Master plan:**

The 2037 Water Master plan was developed by Sabbour Consulting; it assumed that the current service area which extends from Abuqir east to Marsa Matrouh west and reaches to Noubaria in the south will remain the same by 2037. The master plan has significantly considered the expected urban expansion at Burg El-Arab in the west and the anticipated industrial expansion in various locations in the governorate.

The master plan revolved around the following four focal points:

- Securing raw water sources.
- Securing service to informal settlements
- Securing service to areas that belong to Beihera Governorate.

- Securing service to areas that belong to Marsa Matrouh Governorate.

It also gives special attention to the following issues:

- Continuous evaluation of existing water supply plants.
- Studying alternatives for improving plants efficiency.
- Studying alternatives for improving networks.
- Setting priorities for future projects.

### **Alexandria 2037 Sanitation Master plan:**

The 2037 Sanitation Master plan was developed by Misr Consulting, it revolved around the following:

- Exploring areas for future expansion.
- Projects to be implemented by the year 2037.
- The budget needed for future projects.

### **Current Stakeholder Map and Relevance to SWITCH Alexandria IUWM:**

The main expected output from SWITCH project in Alexandria is an IUWM plan, therefore an important question is raised, should the institutional setup be modified to cope with the IUWM plan or should it be the other way round. The answer to that question varies with different cultural backgrounds. A person with a beaurocratic mind setup will tend to have a great respect to an existing institutional setup, while free minded spirits will regard future water needs as a priority that anything else has to adapt to. This study definitely supports the liberal opinion of modifying the current institutional setup to be more decentralized. In the following lines, the main elements of the Alexandria IUWM will be quickly reviewed and the corresponding decision making entity for each particular element will be identified. In many cases there will be more than one authority responsible for a particular water source, only the most influential one will be mentioned.

- Ground Water Management: MWRI is the sole authority responsible for groundwater.
- Storm Water Management: due to the relative insignificance of this resource, it is not clear whether there is a role for MWRI in applying storm water management measures on the urban/ city level. Therefore the Alexandria Waste Water company could be regarded as the main key player in this area.
- Water Demand Management: lies within the responsibilities of Alexandria Water Company.
- Waste Water reuse: Obviously related to the Alexandria Waste Water Company.
- Financial sustainability: is currently an individual responsibility for every key player in the Alexandria Water Sector.

- Desalination: It is not clear who makes decisions regarding that rarely used source.
- Urban Modeling: Capacities are currently being built in the Alexandria Water Company and will be expanded to the whole Alexandria Water sector by the end of the SWITCH project.

The collaboration between all the entities mentioned above has been well strengthened by the SWITCH Learning Alliance (LA). The IUWM plan will be set up and written by actual LA members. This will provide a midpoint between bureaucrats and liberals in the sense that innovations will be made in accordance with current institutional setup except in cases where modifications are necessary.

## **Challenges and Opportunities:**

One of the most important objectives of the SWITCH LA was the involvement of all stakeholders. When examining that in Alexandria, we could easily see that water users are somehow misrepresented in the LA. However, one of the great successes of the LA was its direct involvement in the strategic planning. Involvement of poor and marginalized people in decision making needs a drastic cultural change, not only in Alexandria, but all over the globe. In many places in the world, the poor are a winning card for many politicians to reach their goals and get re-elected. This approach, although not purely orthodox, could be a start point for social inclusion in Alexandria. This study approves the current institutional setup with one reservation concerning the misrepresentation of average water users. “Water Boards” can be the magical term to better the current institutional setup. In this case, we can introduce an important governmental key player which is “Syndicate of the people” or simply the “Parliament”. Water boards can be directly linked to every syndicate member. That member is responsible for conveying messages from his/her corresponding board to the syndicate which is the highest driving force institutional reform in the country.

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