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Thesis Title:

The Role of government & CSOs in promoting sustainable
consumption;

"The case of domestic water and electricity use in Cairo, Egypt"

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Executive Summary

The Government of Egypt (GoE) had signed in the year 2007, the agreement for a 10 years African Framework Program that aims to introduce Sustainable Consumption and Production (SCP) programme in the City of Cairo. Later, the SCP report, which was issued in the year 2008, reviewed policies relevant to Sustainable Development at both; National and Local level within four different thematic areas. However, the report fails to cover household service consumption behavioural patterns.

Therefore, this research aims to look into policy and strategic options for reaching sustainable household consumption in the City of Cairo, focusing on water and electricity use. This is done through studying the factors affecting consumer behaviour. In addition, investigate the role of both government and civil society organizations in influencing household service behaviour. It looks at the perspective of stakeholders on identifying the effective policy instruments to promote sustainable service use with regards to water and electricity use.

This is an exploratory policy-related research. The main tools and instruments used in this research, next to the literature review, is the in depth interview conducted with government officials and civil society organizations involved in the field of household water and electricity consumption. Moreover, a survey was conducted in one district within the City of Cairo which is Al-Manial district to review the factors which influence household water and electricity consumption behaviour and to know their perception on how sustainable household water and electricity consumption should be promoted.

The research findings include documenting the currently used instruments by the national government and the civil society, to arrive at more sustainable water and electricity consumption patterns. These instruments include the issuance of new water and electricity law, besides the existence of service pricing and the use of different type of awareness campaigns. However, this is not always clearly targeted as sustainable consumption.

Another finding of this research, that it gives clear understanding on the factors which affect household service behaviour. This include, level of awareness, level of responsibility, following conservation practice and level of trust. However, it was observed that there is a directly proportional relation between these factors and the level of income, education and religious belief. Generally, the attitude of households is considered very promising for receiving awareness campaigns due the current situation in Egypt. Moreover, awareness campaigns are found to be the most effective policy tools to be used.

The topic of sustainable service use is essential in city development and management. Therefore, it would be considered vital to allocate more time for professionals and experts to work on finding alternative sustainable solutions for water and energy resources, which may help in improving the consumers' quality of life.

Finally, the topic of sustainable service consumption requires a lot of effort to be spend in Egypt, in order to remove all the current barriers and challenges which may face the implementation of this concept. Accordingly, further research should be done in the field of household service behaviour on large scale in the City of Cairo, as a step forward to build a strong data base for consumer service behaviour.

Keywords: Sustainable Service Consumption; water and electricity; Cairo; Household; Civil Society Organizations; National Government.

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Abbreviations

CAPMAS	Central Agency for Public Mobilization and Statistics
CSOs	Civil Society Organizations
CEO	The Egyptian Consumer and Energy Organization
CI	Consumers International
CIWC	Consumers International World Congress
EEAA	Egyptian Environmental Affairs Agency
EEHC	Egyptian Electricity Holding Company
EEIGGR	Energy Efficiency Improvement and Greenhouse Gas Reduction Project
ECP	Environmental Choice Programme
ESC	Education for Sustainable Consumption
ETV	Environmental Technologies Verification
EWRA	The Egyptian Water Regulatory and Consumer Protection Agency
Egypt ERA	The Electric Utility and Consumer Protection Regulatory Agency
EGP	Egyptian Pound
EUWI	European Union Water Initiative
GoE	Government of Egypt
GDP	Gross Domestic Product
HCWW	The Holding Company for Water and Wastewater
JCEE	Joint Committee for Energy Efficiency
JPOI	Johannesburg Plan of Implementation
LA21	Local Agenda 21
LCA	Life Cycle Assessment
MTOE	Million Tonnes of Oil Equivalent
OECD	Organization for Economic Co-operation and Development
SC	Sustainable Consumption
SCP	Sustainable Consumption and Production
SHWEC	Sustainable Water and Electricity Consumption
SoE	State of Environment
UN	United Nations
UNEP	United Nations Environmental Programme
UN-HABITAT	The United Nations Human Settlements Programme
UNDESA	United Nations Department of Economic and Social Affairs
WSBSP	Water Sector Budget Support Programme
10-YFP	10 year framework programme

Table of Contents

Executive Summary	i
Acknowledgment	ii
Abbreviations	iii
List of Figures	vi
List of Tables	vii
Chapter 1 Introduction	1
1.1 Background.....	1
1.2 Problem Statement.....	2
1.3 Research Objective	2
1.4 Research Questions	2
1.5 Significance of the Study.....	3
1.6 Scope and Limitations	3
1.7 Thesis Structure	4
Chapter 2 Literature Review	5
2.1 Introduction	5
2.2 Definition of Sustainable Household Service Consumption	5
2.2.1 Consumption.....	5
2.2.2 Sustainable Consumption	5
2.2.3 Household Service Consumption Behaviour	6
2.2.4 Policy Instruments	6
2.3 History of Sustainable Consumption	6
2.4 Understanding Household Water and Electricity Consumption Patterns	7
2.4.1 Social Factors.....	7
2.4.2 Economic Factors	9
2.5 Promoting Sustainable Household Water and Electricity Consumption (SHWEC); Role of Multi-Actors:	10
2.5.1 The Role of Governments.....	10
2.5.2 Role of Civil Society Organizations (CSOs)	14
2.6 International Cases	16
2.6.1 Think Twice: An action plan for Sustainable Household Service Consumption, Sweden:	16
2.6.2 Helping people to make better choices; "The New Community Action 2020", program in England:	17
2.7 Combining Policy Instruments	18
2.7.1 Soft Measures	19
2.7.2 Hard Measures	20
2.8 Conceptual Framework.....	21
Chapter 3 Research Methodology	22
3.1 Introduction	22
3.2 Research Design	22
3.3 Research Type and Strategy	23

3.4	Data Collection.....	23
3.4.1	Primary Data Collection.....	23
3.4.2	Secondary Data Collection.....	24
3.5	Sampling Size and Technique	24
3.6	Pilot Test.....	24
3.7	Research Operationalization.....	25
3.8	Study Area	27
3.9	Time Scheduling.....	29
3.10	Data Analysis.....	30
Chapter 4 Contextual Background		31
4.1	Introduction	31
4.2	Cairo City Local Context.....	31
4.3	Water and Electricity Consumption Patterns.....	33
4.3.1	Water.....	33
4.3.2	Electricity.....	34
4.4	Legal Context of water and electricity Services	35
4.5	Institutional setup for water and electricity services	36
4.6	Programmes on water and electricity service consumption.....	39
4.7	Government Instruments for Sustainable Water and Electricity Consumption.....	41
4.7.1	Water Sector.....	41
4.7.2	Electricity Sector.....	45
4.8	Civil Societies Instruments for Sustainable Water and Electricity Consumption	48
4.8.1	Water Sector.....	48
4.8.2	Electricity Sector.....	49
4.9	Summary.....	50
Chapter 5 Research Findings.....		51
5.1	Introduction	51
5.2	Survey Findings.....	51
5.2.1	Socio-economic Background	51
5.2.2	Factors Affecting Households Consumption Behaviour	53
5.3	Policy tools to promote SHWEC in Cairo city	67
5.3.1	Stakeholders Perception on Policy Tools	67
5.3.2	Effectiveness and Acceptance of Tools.....	69
5.3.3	Interaction of Stakeholders.....	69
5.4	Conclusion	70
Chapter 6 Conclusions and Recommendations.....		71
6.1	Introduction	71
6.2	Reflection on Research Question	71
6.3	Reflection on Literature.....	73
6.4	Conclusions	75
6.5	Recommendations	75
6.6	Further Research.....	76

References	77
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Annexes	81
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List of Figures

Figure 2. 1: Factors influencing consumer behaviour	9
Figure 2. 2: The UK Strategy for achieving the Sustainable Household Consumption Strategy	18
Figure 2. 3: Conceptual Framework.....	21
Figure 3. 1: The Research Design.....	22
Figure 3. 2: El-Manial District Pilot Area.....	27
Figure 3. 3: Al-Manial district high income group housing	28
Figure 3. 4: Al-Manial district middle income group housing	28
Figure 3. 5: Al-Manial district middle income group housing	28
Figure 3. 6: Surveyed households within the study area	29
Figure 4. 1: Cairo City Location in Egypt.....	31
Figure 4. 2: Cairo City Districts.....	32
Figure 4. 3: Water share per use	33
Figure 4. 4: Residential sector water consumption patterns.....	33
Figure 4. 5: Electricity consumption per sector	34
Figure 4. 6: Summer consumption patterns	34
Figure 4. 7: Winter consumption patterns.....	34
Figure 4. 8: Water service organizational chart	38
Figure 4. 9: Electricity service organizational chart.....	39
Figure 4. 10: Water conservation materials	43
Figure 4. 11: Children making use of the educational materials	44
Figure 4. 12: Some of the conservation materials used by government.....	47
Figure 4. 13: Workshop on water conservation practices	49
Figure 5. 1: Income groups frequencies within the sample.....	51
Figure 5. 2: Educational background groups frequencies within the sample	52
Figure 5. 3: Relation between level of income and level of water awareness	55
Figure 5. 4: Relation between level of education and level of water awareness	55
Figure 5. 5: Relation between religious belief and level of water awareness	56
Figure 5. 6: Relation between level of income and level of electricity awareness	57
Figure 5. 7: Relation between level of education and level of electricity awareness	58
Figure 5. 8: Relation between religious belief and level of electricity awareness.....	58
Figure 5. 9: Relation between level of income and level of responsibility with water use	60
Figure 5. 10: Relation between level of education and level of responsibility with water use.....	60
Figure 5. 11: Relation between religious belief and level of responsibility with water use	61
Figure 5. 12: Relation between level of income and level of responsibility with electricity use	62
Figure 5. 13: Relation between level of education and level of responsibility with electricity use.....	62

Figure 5. 14: Relation between religious belief and level of responsibility with electricity use	62
Figure 5. 15: Percentage of each income group usage of water conservation practices	64
Figure 5. 16: Percentage of households using electricity conservation practices	65

List of Tables

Table 3. 1: Interviewed stakeholders	23
Table 3. 2: Size of the population and the sample.....	24
Table 3. 3: Variables and Indicators	26
Table 3. 4: Fieldwork time schedule.....	29
Table 4. 1: Summary of government used instruments in water sector.....	44
Table 4. 2: Energy tariff structure for the residential sector	46
Table 4. 3: Summary of government used instruments in electricity sector.....	48
Table 4. 4: Summary of civil society used instruments in water sector	49
Table 4. 5: Summary of civil society used instruments in electricity sector	50
Table 5. 1: Educational Background of the three income groups.....	52
Table 5. 2: Respondents categories regarding awareness with water use	54
Table 5. 3: Respondents categories regarding awareness with electricity use	56
Table 5. 4: Respondents categories regarding responsibility with water use	59
Table 5. 5: Respondents categories regarding responsibility with electricity use	61
Table 5. 6: Following water conservation practice and educational level cross-tabulation.....	64
Table 5. 7: Following water conservation practice and religious belief cross-tabulation.....	64
Table 5. 8: Following electricity conservation practice and educational level cross-tabulation.....	65
Table 5. 9: Following electricity conservation practice and religious belief cross-tabulation.....	66
Table 5. 10: Policy options selected by households.....	69

Chapter 1 | Introduction

1.1 Background

Recent urbanization trends have shown dramatic increase over the past few decades; currently more than 50% of the world's population take residence in cities. These trends show no signs of change as people continue to move from rural to urban areas. By the year 2025, it is expected that urbanization trends will drastically increase forming metropolitan regions through the agglomeration of cities. This phenomenon is expected to lead to an increase in the imbalance between the demand for services and the available supply of such services provided (Kresl & Ni, 2010). Hence, an increase in the pressure on environment within urban areas is expected, especially with the excessive increase in the consumption trends of citizens at the city level. Abbreviations

Moreover, Agenda 21 recognized that unsustainable patterns of consumption and production of citizens within the city level is the main contributor to environmental deterioration globally (Consumer International, 2007). Similarly, and based on recent living standard surveys, the World Bank estimates that households in the most prosperous areas of developing countries, such as Brazil, Bulgaria, Ghana, Indonesia, Morocco, and Sri Lanka have an average consumption level almost 75 percent higher than that of similar households in the rural areas of these countries (World Bank, 2009).

In Egypt, similar trends are observed. The city of Cairo is currently one of the most populated cities in the world with a population of 10 million inhabitants and a total area of 362.65 km² (CAPMAS, 2010). Together with 2 other governorates, Cairo governorate forms the agglomeration of the Greater Cairo region, with a population of more than 18 million inhabitants. Greater Cairo is responsible for 31 percent of the GDP of the Arab Republic of Egypt's GDP, and occupies a mere 0.5 percent of its land area (World Bank, 2009).

On the other hand, Egypt is currently facing problems of water scarcity (Abdel-Gawad, 2007). This is due to the rapid increase in the population growth rate and the simultaneous deterioration in water quality. Thus, higher water demands of households coupled with that of economic activities, are adding more pressure on the limited water resources. It was estimated by Abdel-Gawad et al.(2004) that based on the current consumption patterns, the current water share per capita will decrease from 1000m³/capita/year till it reach 600m³/capita/year by 2025. This indicates that Egypt would be facing water scarcity problems within a few years.

Likewise, the Egyptian Electricity Holding Company (EEHC) has revealed in its annual report (2009) that since the year 2008, there has been a huge gap between the electricity demand and the actual electricity generated on the national level. As the peak demand in the year 2009 has reached 21330 MW, the energy generated was not sufficient to cater for these high consumption patterns. There is a chronic shortage problem regarding the interruption of electricity services due to the limitation of the existing electricity generating power plants capacities, especially during the summer season where demand for electricity surges. Hence, it is considered a challenge for the national electricity grid company to meet the growth in demand of electricity supply to both the household sector and the economic sector (EEHC, 2009). Meanwhile, EEHC is expecting that the annual growth rate of demand will increase up to 10% in the coming year, 2012, which is a true challenge due to the limitation in the capacities of power plants in addition to the limitation of the technical and financial resources.

Backed up by the aforementioned facts, Kemp et al. (2007) remarks the need to shift from the present unsustainable consumption patterns to a more sustainable life style. They pointed out that governmental policies and strategies should be the tool to engage communities in radical changes in the community towards sustainable community in-terms of culture, policies and governmental systems, through reviewing the current policy framework and adding more adaptive and sustainability oriented governance system.

1.2 Problem Statement

In the year 2007, the Government of Egypt (GoE) signed an agreement for a 10 years African Framework Program that aims to introduce Sustainable Consumption and Production (SCP) program in city of Cairo. This program is initiated by the United Nations Environmental Programme (UNEP). As a result of this agreement, the Egyptian National Cleaner Production Centre published the Sustainable Consumption and Production (SCP) program report in 2008, with a focus on four main thematic areas; Transportation, Urban Development, Solid Waste Management and Industrial Development (UNEP, 2008).

The SCP report started with reviewing policies relevant to Sustainable Development at the National and Local level within the four thematic areas mentioned above. Pilot projects have been proposed and prioritized through the program stakeholders; conceptualizing high priority actions needed in relation to the main four thematic areas covered by the program.

On the other hand, the report fails to address appropriate actions and policies to tackle households' consumption behavioural pattern, and their perception and awareness of sustainable consumption. Although, household consumption is considered a cross cutting issue for the four thematic areas, as it deals directly with the end user (consumer) behaviour patterns. The report lacks as well the actions needed to promote more sustainable household consumption trends. This was noticed despite the fact that the current household consumption patterns are considered unsustainable and needed to be changed based on the facts mentioned in the background section of this research.

1.3 Research Objective

The main aim of this research is to review the concept of sustainable household water and electricity use, in addition to look into the role of both government and CSOs in influencing the household consumer behaviour. It explores the perspective of stakeholders for introducing the effective policy instruments to promote sustainable consumption for household water and electricity use.

Research Objective

To investigate policy and strategic options for reaching sustainable water and electricity consumption patterns in the City of Cairo.

1.4 Research Questions

Based on the above objective, the main research question is as follows;

'How Can Sustainable Household Water and Electricity Consumption (SHWEC) be promoted in Cairo city?'

From the main research question, three different sub-questions are derived to guide the research direction and give a clear and complete overview of the subject matter;

Sub-question 1

'What are the current undertaken actions in Cairo towards sustainable household water and electricity consumption?'

Sub-question 2

'Which factors determine sustainable water and electricity consumption patterns in household in the City of Cairo?'

Sub-question 3

'What future approach should be taken for promoting SHWEC within Cairo city, as perceived by stakeholders?'

1.5 Significance of the Study

This research is considered of high significance. It is adopted at a convenient timing, since the Government of Egypt (GoE) as mentioned above, has recently accepted to introduce Sustainable Consumption and Production (SCP) program within the city of Cairo. This research is considered as a step forward for introducing the concept of sustainable service use in Cairo, as it builds on policy approaches that promote sustainable consumption within the households' level. This paper is expected to be a useful practical document for policy makers to use for addressing and launching effective policy tools to promote a sustainable consumption approach.

Thus, this research is addressing the need for developing a framework to facilitate the implementation of sustainable consumption within city households. Finally, this paper is contributing to the existing relevant literature with a broad level of analysis of different concepts and fieldwork through primary and secondary data collection.

1.6 Scope and Limitations

The research aims to investigate the roles that both government and CSOs can assume to influence household water and electricity consumption behaviour. The scope of the research is to recommend a framework for the most effective policy instruments to promote sustainable household water and electricity consumption (SHWEC). In the first section; the researcher reviews the concept of SHWEC in order to build a better understanding of consumption behaviour trends and the role of government and CSOs in a broad review. In the second part; the researcher analyzed the context of city of Cairo through working on a study area for addressing the perception of officials, CSOs and households themselves in search for effective policy tools which can be used to promote SHWEC.

In this regards, it is important to point-out that the main focus of this research is to address policy instruments to promote sustainable household service consumption as perceived by stakeholders in the sectors of water and electricity service use. The research only reviews the role of both government and CSOs and it will not cover the role of the business sector, as it is focusing on the service provided by government. Additionally, it is believed that the government and CSOs can play an effective role in changing the consumer behaviour which will influence, as a result, the business sector to follow more effective policies and have more sustainable products for the consumers.

Finally, time is considered the biggest limitation factor of this research. The collected data during the fieldwork phase is mainly based on what government officials, CSOs and households say. One month for fieldwork study is considered very limited for real understanding on the actual behaviour of households and the role which stakeholders can effectively play in promoting SHWEC. However, the primary and secondary data collection

methods will be used in an effective way to cover all the raised issues by the questions that are the focus of this research.

1.7 Thesis Structure

The report is divided into six chapters; starting with the introduction chapter. *Chapter two* examines the available literature related to the concept of SHWEC and investigates the rationale behind consumption behaviour of households. By the chapter further elaborates upon the role of government and CSOs through addressing good learning practices for some international cases in promoting a set of policy instruments to effectively promote sustainable consumption.

Chapter three of the research looks into the methodology used and applied for the study. It gives an overview on how the research process is designed and carried out. It delves into the details of the methods used to respond to the main question of this research and the sub-questions. It includes an overview for the study area, primary and secondary data collection and analyzing of collected data.

Chapter four covers the national context of Egypt and the local context of Cairo city, in terms of the undertaken actions in the field of sustainable consumption and mainly sustainable household service consumption. *Chapter five* illustrates the fieldwork findings and the collected data from the fieldwork.

Finally, *chapter six* addresses the research outcomes, conclusions and recommendations from the researcher for the best set of policy tools to promote SHWEC.

Chapter 2 | Literature Review

2.1 Introduction

This chapter is an overview of the literature available on the concept of Sustainable Consumption (SC) and Sustainable Household Water and Electricity Consumption (SHWEC). It reviews factors influencing consumer behaviour and the role of stakeholders in promoting SHWEC.

The literature review in this chapter is divided into different parts. The first part focuses on addressing definitions for the key terms used in this research, while the second part deals with the historical background of the Sustainable Consumption concept. The third part addresses the factors influencing consumer behaviour regarding water and electricity use, followed by an identification of tasks that government and Civil Society Organizations (CSOs) can undertake to promote Sustainable Household Water and Electricity Consumption (SHWEC). This includes policy instruments, and actions for organizing the capacity of different stakeholders; government, CSOs and citizens in promoting SHWEC. The fifth part reviews two case studies for promoting sustainable household service consumption in both Sweden and the United Kingdom. Finally, a conceptual framework is developed for linking both the factors influencing household behaviour and policy instruments to promote sustainable service consumption.

2.2 Definition of Sustainable Household Service Consumption

2.2.1 Consumption

According to the OECD (2002), the term *Consumption* refers to the utilization of goods and services by consumers and households. On the other hand, Lettau & Ludvigson (2000) used the term consumption to refer to the process of selection of goods and services by households. However, the term "consumption" in this research is refers to the utilization of services by households with regards to water and electricity use. However, it does not include public sector consumption but will be used in relation to household consumption only.

2.2.2 Sustainable Consumption

The term *Sustainable Consumption* (SC) is considered open to different interpretations of the term sustainability and how sustainability is measured. The definition of the term Sustainable Consumption was developed by the Norwegian Ministry of Environment as "*the use of goods and services that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardize the ability to meet the needs of future generations*" (Tukker & Hertwich, 2007). SC term can also be defined as a dynamic trend of changes towards a desired direction of more environmentally friendly way of living with less impact on the environment (OECD, 2002). Yet, sustainability is considered an argumentative issue, as it deals with different aspects; the social, political and economic.

The concept of Sustainable Consumption is promoting the idea of '*decoupling*' of economic activities from environmental degradation, through introducing changes to the service utilization chain and ensuring the efficient use of resources with less energy consumption and less damage to the environment. Moreover, adding change in households' way of consumption through promoting ideas of eco-efficient, green behaviour and generating less waste (Jackson & Michaelis, 2003). The Sustainable Household Water and Electricity

Consumption (SHWEC) concept is a practical translation of how to turn environmental and social challenges into opportunities which will lead to a more eco-efficient economy (UN, 2003).

According to this research, *sustainable consumption* can be identified as meeting the needs of consumers in an efficient way together with minimizing the environmental impacts of their consumption patterns. This was addressed as a key goal by *Jacqueline Aloisi de Larderel, UNEP Assistant Executive Director*, where sustainable consumption does not target consuming less, but rather deals with consuming differently and efficiently, besides improving the quality of life (UNEP, 2010).

2.2.3 Household Service Consumption Behaviour

The focus of this research is the household service consumption process. Household service consumption behaviour can be identified as the day-to-day process of consuming services, including the lifestyle of households and their ways of water and electricity consumption (Bently & De Leeuw, 2002).

In this research, household service consumption behaviour patterns is analyzed and identified as a step for achieving the radical change in the way of consumption in order to ascribe the term sustainable to household service consumption. This is based on the assumption that the environmental impacts of household service consumption have a direct relation to current environmental problems (OECD, 2006).

2.2.4 Policy Instruments

Policy instruments are structured activities aimed at changing societal activities towards desired policy goals (Robert, 2004). They are considered the tools which governments can use in order to influence the behaviour of people.

This set of activities and actions includes three types of instruments; **Regulatory tools**, which are the direct regulations affecting the behaviour of society, including laws and regulations. **The Economic tools**; are considered indirect regulations, aiming to influence the behaviour of citizens in different ways including the use of market-based instruments (Lorek, 2005). The final form of policy instruments are the **Self regulating tools** or social tools, which are considered as tools used on voluntary basis, aiming at guiding the relations between different parties. Nonetheless, the integration of different types of policy instruments which directly influence the household consumption behaviour is the main scope and approach of this research.

2.3 History of Sustainable Consumption

The terminology Sustainable Consumption began to emerge at the UN conference on Environment and Development held in Rio de Janeiro in the year 1992. The working definition of Sustainable Consumption was for the first time coined and clearly stated in 1994 in Oslo during the Oslo Symposium on Sustainable Consumption (Jackson & Michaelis, 2003).

During the World Summit on Sustainable Development, conducted in Johannesburg in the year 2002, participating countries signed the Johannesburg Plan of Implementation (JPOI) and recognized the "*Fundamental changes in the way societies produce and consume are indispensable for achieving global sustainable development*" (Clark, 2006, pp. 492-498). The Johannesburg Plan invited all governments to work on promoting Sustainable Consumption and Production (SCP) through developing a 10 year framework programme (10-YFP), in

order to take-up regional and national initiatives which would help speed-up the shift towards sustainable consumption and production. While facilitating the implementation of sustainable consumption and production patterns, promoting social and economic development (UNEP, 2008).

Consequently, the '*Marrakech Process*' was launched in the year 2003 to enhance and strength the international coordination between governments and facilitates the implementation of national SCP programmes, through building national strategies and mechanisms to develop Sustainable Consumption and Production tools and processes. The SCP program aims at supporting the local authorities to implement the Local Agenda 21 (LA21). The program is mainly working with cities that lack capacities and are not usually included in international development programs. This is based on the assumption that promoting good urban governance through supporting the implementation of the local environmental action plans is considered one of the main aims of the program (UN-HABITAT, 2008).

Additionally, the African Union also started to promote the implementation of the Sustainable Consumption and Production (SCP) programme through launching the African 10-YFP on SCP in the year 2006. This was done with the institutional support of UNEP (Tessema & Kotakorpi, 2007).

2.4 Understanding Household Water and Electricity Consumption Patterns

Klaus Töpfer, UNEP Executive Director (2002) indicated that '*Consumers are increasingly interested in the world that lies behind the service they use or product they buy. This increasing awareness about environmental and social issues is a sign of hope. Governments must build on that.*' (UNEP, 2002, P.9)

Here it is worth mentioning that, Lorek & Spangenberg (2001) argues that households' as consumers usually have partial influence on how they utilize services provided. According to a report from the United Nation (2003), policy makers are urged with the help of other relevant stakeholders to conduct a research on consumer behaviour patterns. This would help in getting better understanding on the factors that influence consumption behaviour. Accordingly, this will come-up with the most effective policies needed to promote new forms of sustainable consumption patterns (Fuchs & Lorek, 2001). Hence, understanding consumer behaviour is considered a focal point in achieving sustainable household service consumption.

According to Wagner & Taudes (1987), consumer behaviour is a complex process shaped and affected by different forces and motives. Many factors control and govern consumer behaviour, with direct relation with social and economic factors.

2.4.1 Social Factors

The first pillar which influences the decision-making process of households comprises *the social factors*. This includes; attitude, culture and background of consumers, beside the educational level and the environmental concern of households. Psychologists argue that consumption behaviour is considered a habit which can be changed and influenced by many factors (OECD, 2006). The *social contingency framework* has been used by Gust (2004) to identify the social factors affecting the consumption behaviour. These factors are divided as follows:

A. Personal Attitude

Gust (2004) focused on the personal attitude factor, which was assumed by Stern (2000) that it shapes and influences consumers' behaviour. The personal attitude factor is controlled and shaped by three different conditions. The first one is the *level of awareness* of consumers regarding the consequences that their behaviour may have on others and on the environment. Jackson & Michaelis, (2003) reveals that consumers' awareness and knowledge affect habits and unreasoned behaviour.

The second condition is the *level of responsibility* that people feel. If consumers believe that they have the power to change the negative impacts of their behaviour, this will add changes to their consumption behaviour. Clake et al. (2006) emphasizes that when consumers consider the environment within their daily consumption; they will have a high level of responsibility with their consumption behaviour. This was examined by Didham et al. (2010) when consumers consider the environment within their daily water consumption; they are directly engaged in conservation strategies. For example, Aitken et al. (1994) has reported that consumers changed their attitude towards water consumption when raising their awareness regarding water conservation behaviour was raised.

Consequently, Corral-Verdugo et al. (2002) reported that the third condition for personal attitude is the *level of trust*. It plays an essential role in the behaviour of consumers and their attitude. When consumers trust the service provider authority regarding the effectiveness for offering services, and the need to consume in an effective way; they will be actively responsible towards consuming services in an efficient way.

B. Culture

As recognized by Liegeois & Cornelissen (2006), cultural factors such as *social norms* and *religious beliefs* have a direct impact on consumer behaviour. Thus, Gregory & Di Leo (2003) indicate that consumer behaviour habits are shaped by the surrounding social norms, which include family, friends and neighbors. This has a direct links to the consumers' environmental behaviour when dealing with the daily used services. For example, Kiraci & Kayabasi (2010) denotes that consumers which tend to use household energy conservation applications, their neighbours are most likely to want to follow the same way of behaviour. On the other hand, it was observed by Dobson (2007) that religious beliefs encourage good behaviour as consumers usually link their way of consumption with the set of ethical principles embedded in their religion.

C. Level of education

OECD (2002) points to the fact that consumption behaviour of households with higher levels of education regarding daily services (water, waste generation and energy) differs from other households with lower levels of education. It was remarked by Riddel (2003), that households' understanding of the benefits of adopting environmentally friendly consumption behaviour is positively linked with their level of education; the higher the level of education, the more the level of awareness. This was remarked due to their ability to link their consumption behaviour impacts on issues like climate change. Didham et al. (2010) indicates that there is a clear link between an individual's support and interest towards more environmental behaviour with their level of education. Gust (2004) found that people with a higher level of education were more likely to engage in water and energy conservation practices.

2.4.2 Economic Factors

A report from OECD (2002) highlights to the fact that also economic factors influence consumer behaviour. These economic factors include *the pricing system and the level of income*. In this context, the theoretical framework which can identify and explain the consumer behaviour from the economic side is the *household propensities* framework. As the Gross Domestic Product (GDP) per capita has high influence in identifying the way of lifestyle for consumers and households, beside the consumer welfare which influences their behaviour towards services (OECD, 2006).

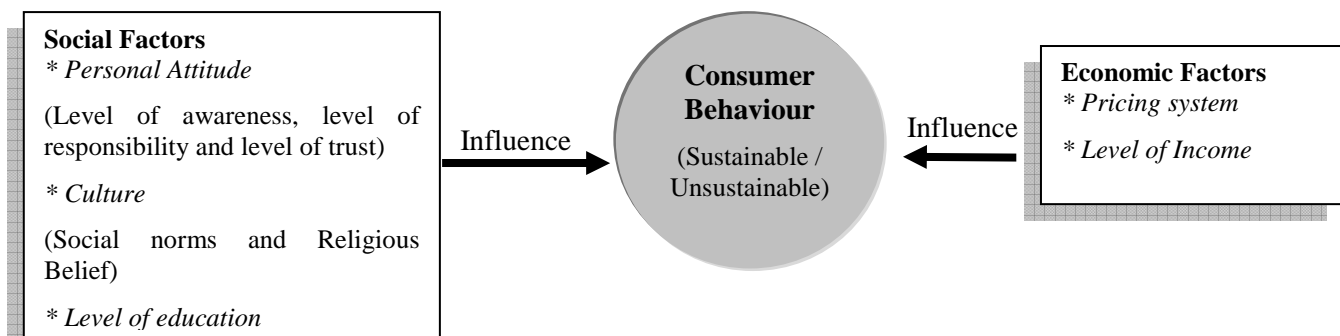
A. Pricing

Kiraci & Kayabasi (2010) indicate that the price structure of services has a direct influence on household service use. A person usually wants to reduce the amount of money spent on services. There is a direct relationship between consumer behaviour towards services and the pricing system of these services (Holden 2004 and Kiraci & Kayabasi 2010). Similarly, Mont & Plepys (2008) reports that low income households reduce their water and electricity consumption when services pricing increases compared to medium and high income households. This indicates that pricing is a more effective demand strategy for households. For example, Dobson (2007) reveals that the pricing system of services is one of the main factors which influence Mexican citizens' water use. She found that consumers significantly reduced their annual water consumption rates through the use of water conservation practices when the government starts to remove subsidies on the extensive household use of water.

B. Level of income

Another factor, which affects consumer behaviour is the level of income. Jorgensen et al. (2009) indicates that the level of income is one of the variables which describe the lifestyle of households and their daily consumption patterns. There are two different arguments related to the impact of income on consumption patterns. According to Holden (2004) populations with positive environmental interests regarding their consumption behaviour are usually described as a population with higher income, and a higher level of participation in environmental groups. On the other hand, Dobson (2007) reported that as incomes increase, sensitivity to the perceived costs of consumption patterns on the environment is diminished. She had tested a model for the relation of level of income and lifestyle on the daily consumption behaviour on the residents of Shoalhaven neighborhood in Australia. She found that consumers of low income groups had shown more interest than consumers of high income groups to use more energy efficient appliances if government will subsidize such appliances. However, whether the relation between the level of income and consumption patterns is positive or negative, it has a direct impact on consumer way of behaving.

Figure 2. 1: Factors influencing consumer behaviour



Source: Author, 2011

2.5 Promoting Sustainable Household Water and Electricity Consumption (SHWEC); Role of Multi-Actors:

Different sources emphasize that reducing the environmental impacts of household consumption will require the collaboration of multi-stakeholders (UNEP, 2002; Allely & Farah, 2002). Stakeholders include; government side, business sector, civil organizations and finally the participation of consumers themselves (UNEP, 2002).

For example, the Sustainable Consumption Roundtable in the year 2006 stated that influencing consumption behaviour require the participation of all stakeholders in the society to achieve sustainable consumption patterns. Changing unsustainable patterns is not a single action for one actor alone, but together with other key actors, they can form the triangle of change (Allely & Farah, 2002). According to the United Nations in one of their publications on this topic (2003), the responsibility for making change in consumer behaviour requires a multiparty effort by government, business and civil society actors.

According to Fuchs & Lorek (2001), government should work on creating supportive policy framework and instruments, targeting the efficient service use. While for CSOs, it is important to work in introducing creative instruments for consumers' behavioural change. Hence, in this part of the literature, the role of both the government and CSOs in promoting SHWEC concept is elaborated next.

2.5.1 The Role of Governments

According to Robert (2004), people will not change their behaviour unless they are forced by laws and regulations. Similarly, Bas de Leeuw, Sustainable Consumption Programme Co-ordinator, UNEP, has explained that to help individual consumers to take environment in consideration regarding their daily consumption patterns; governments should develop a mix of legal and economic instruments in a broad range of policies. This includes designing a wide range of sustainable service use and energy efficient policies (UNEP, 2002).

Generally, Van den Berg & Braun (1999) stated that national and local government can play an effective role in implementing Sustainable Household Service Consumption concept, through shifting from the government-driven concept towards the term '*Governance*'. This will incorporate the involvement of multi-stakeholders and the inclusion of key players in the decision making process. This will evidently present numerous opportunities for the implementation of the concept. Government can start building strong and strategic networks between all effective stakeholders towards achieving better policy making and more entrepreneurial co-operation between the key players. Eventually, such policies will work together on eliminating poverty and securing the basic needs of the society besides reducing the gaps between the classes within the community.

Policy instruments and tools for SHWEC

Policy instruments are employed by governments as effective tools to enhance the efficiency of changing consumer behaviour and promoting Sustainable Household Water and Electricity Consumption. It is worth to mention here that the most effective policy tools would differ from one location to another according to the context of each case. Hence, governments should be selective in regards to the choice of the set of policies which promises to be most effective within their own local context (UNEP, 2002). Policy instruments are divided as follows:

- **Regulatory Tools:**

Regulatory tools are used by governments to directly affect household consumption behaviour through regulatory limitation for the use of services. Regulatory tools are also

used to set strict standards for services, in order to influence the household decision making process (Liegeois & Cornelissen, 2006).

Examples for the use of regulations to promote *sustainable electricity use* include; the US government introduced energy efficient standards in the year 1996 for household appliances which helped to reduce the energy use of such appliances by 50% within the same pricing system (Dobson, 2007). The same happened recently with the Slovenian government through setting a minimum standard for energy efficiency of home appliances. Similarly, the EU introduced as well, minimum requirements for efficiency use of electricity in new buildings through the use of minimum limits of renewable energy use for electricity generation (OECD, 2008). As a response to the EU energy efficient use, phasing-out of the incandescent light bulbs was introduced in Australia and replacing it with florescent light bulbs, this helped to reduce 20% of the electric use. In Germany, Energy Saving Ordinance was introduced in the year 2002, with the aim of reducing the energy demand for new buildings through the use of efficient heating systems (Lorek, 2005).

While for the *water sector*, the set of instruments include setting standards for water supply in houses. This includes the provision of new water saving technologies; the use of efficient pipes and taps for ensuring reducing the amount of water wasted. This example have been implemented in Denmark, where the government had set a strict water supply scheme which helped to reduce the amount of water wasted during the period of 1990 to 2001 by 41% (Johansson & Lindhqvist, 2005). On the other hand, banning the use of fresh water for gardening can help also in the effective use of water and reduction of the amount of water wasted furthermore (Klein & Thoresen, 2009).

Moreover, administrative tools can be established to operate in-parallel to the regulatory tools in order to further aid in influencing the household decision making towards sustainable consumption patterns. The *Consumer protection agency* is considered one of the main administrative effective tools of high significance in lending access to information regarding efficient service use, such as *the Nordic Swan and the EU Flower Label and the German Blue Angel* (Allely & Farah, 2003).

Lorek (2005) affirmed that the regulatory tools must work in collaboration with different administrative and institutional bodies in order to reach their overall goal to help in protecting the life and health of its citizens. For example, In Finland, the ministry of Environment had worked in collaboration with the Ministry of Trade and Industry in setting energy conservation policies for the provision of energy efficient services. This was achieved by securing the accessibility of information for the negative consumption patterns of such services.

- **Economic Tools:**

Regulatory tools mainly deal with the legal enforcement part. *Economic tools* deal with market-oriented policies aimed at using a flexible range of instruments to influence the household consumption behaviour in a most cost effective way (UNDESA, 2007).

Taxes and charges are considered one of the effective tools used to influence consumer behaviour which helps in adjusting the pricing system of services used. In turn, this should influence household decision making if the financial stimulus is strong enough to change their decision. Taxes and charges are widely used to reduce the consumption rate of certain services and products such as water use, waste generation and the electricity use (OECD, 2008).

For example, regarding *water use*, Mexico had introduced a *water use tax* which is calculated based on the size of the house and the number of family members occupying it. Another example regarding *the electricity use sector* can be driven from the Nordic countries, where they had introduced *ecological tax* in the year 1990 which encouraged the use of energy saving appliances (Rubik et al., 2009).

Subsidies, grants and Incentives are also considered market-based instruments which can be used as "Carrots" of the carrot-and-stick analogy to encourage households for more sustainable consumption behaviour patterns. These include environmental subsidies and tax reduction for certain types of energy efficient services which can help in reducing its fees-for-service, and encourage households to use such kind of services (Allely & Farah, 2003). This was introduced in Sweden, where poor households have been reimbursed with subsidies to help them in investing in energy efficient practices in the field of water and electricity (OECD, 2008). Likewise, the United Kingdom had earmarked 1.2 billion sterling pounds for introducing energy efficient applications in households (UNDESA, 2007).

On the other hand, UNEP (2002) declared that *removal of subsidies* which promotes unsustainable patterns of consumption is considered an important strategy to embrace. For example, removal of government-subsidies on water for heavy consumers would be an effective instrument to limit their extensive use of water.

Finally, this kind of tools must be *well monitored in-terms of enforcement and control*, as it can contribute to increasing the revenue collection for the government, it can also be a burden for the government if it is not effectively used (Mont & Plepys, 2008). Thus, the need for flexible and efficient tax-reform strategy is highly required to result in a cost effective tools.

- **Self Regulatory Tools:**

Self regulatory instruments are considered the third type of policy instruments which can be used by governments. These ranges of policies are working on raising the awareness level for the households through *conducting media communication campaigns* with the help of CSOs in order to promote environmentally friendly behaviour systems. *Consumer protection agencies* can work actively in informing consumers about the environmental impacts of service use. This is in addition to working in the voluntary coordinated consumer initiatives undertaken by CSOs (Peattie, 2009).

For example for such tools, the *Annual Sustainable Week Initiative* in Austria which was initiated by the Ministry of Environment with the help of, coordination with other ministries and CSOs to promote more environmentally friendly behaviour under the Theme of "*That is the way to do it*": *Sustainability*, which is directed at raising the consumers' awareness on sustainable consumption patterns (Vachon & Menz, 2006).

United Nations Guidelines for Consumer Protection

In the year 1985, the United Nations adopted the guidelines for consumer protection in its declaration no. 39/85. These guidelines were proposed for use by governments to develop their national consumer protection legislation and regulation. Later-on, in the year 1999 the guidelines were expanded to include a new section (section G) addressing sustainable consumption, as a response to the UN inter-regional meeting on sustainable consumption which was held in Sao Paulo in 1998 (UNEP,2002).

The new section was offering a guideline for actions which should be followed by governments to promote sustainable consumption. The main focus of the guidelines was

consumers from developing countries, as the guidelines had called governments to take into account the need to help consumers to have an equitable and sustainable way of living, through implementation of the following the coming guidelines (Adopted from UNEP, 2002, pp 64-65);

- Create better understanding of motives which drive consumption and use the results to enthuse other stakeholders to take actions.
- Facilitate flow of information on services, creating a set for price incentives, and legal framework to help consumers' to change their consumption patterns.
- Work in-collaboration with other stakeholders for better policy making process.
- Develop a mix of sustainable consumption policies that include regulations; economic and self instruments; sectoral policies in such areas as waste, housing, transport, and energy; information tools programs to raise awareness of the impact of consumption patterns.
- Encourage recycling programs that encourage consumers to both recycle wastes and purchase recycled products.
- Promote the development and use of national and international environmental health and safety standards for services. This will help reducing the disguised barriers to trade, besides encouraging impartial environmental testing for service.
- Develop new environmentally sound services and technologies, including information and communication technologies that can meet consumer needs while reducing pollution.
- Develop indicators, methodologies and databases for measuring progress towards sustainable consumption at all levels. Such information should be available for public.

Research and Survey:

In 2002, three years after publishing the UN guidelines new section for sustainable consumption, a survey was conducted by UNEP and the Consumer International Organization to assess the progress done regarding implementing the guidelines. The survey covered 53 different government practices in the field of policy tools for addressing sustainable household consumption (Adopted from UNEP, 2002, pp 18-22). The aim of the survey was to document good practices which were implemented thus far by governments.

According to the ***survey findings***, the UN guidelines new section for sustainable consumption was found to be useful for governments in regards to policy making. Based on the survey results, 80% of governments were in support of these guidelines.

Consequently, 80% from the surveyed governments have declared that novel media campaigns are under development to promote activities encouraging sustainable consumption issues.

While, 56% of governments stated that they are working on studying ***consumer behaviour*** as a key issue for developing an effective set of policy tools to promote sustainable consumption.

77% of governments confirmed that the ***regulatory and administrative tools*** and mechanisms are considered the most effective policy tools for consumer protection and changing the consumer behaviour. On the other hand, 58% of governments highlighted the ***economic tools*** as very effective in promoting sustainable consumption. However, the majority of

governments placed an emphasis on the importance of **combining both** legal and economic tools in a set of policy instruments to encourage sustainable consumption.

83% of governments identified **waste recycling practices** as the most implemented legislation and initiatives in the field of sustainable consumption policies. They stated that, they were been supported by both civil society (represented in CSOs operating in the environmental field) and the private sector (represented in environmentally-conscious businesses) in offering and promoting the recycling initiatives.

Finally, 87% of governments claimed that they are supporting initiatives to encourage the **Life Cycle Assessment** approach (LCA) for designing, developing and using safe, energy and resource-efficient services. Moreover, they are considering the **Life Cycle Impacts** studies for the use of environmentally-sound products and services. They are developing initiatives such as; the Environmental Choice Programme (ECP) and the Environmental Technologies Verification (ETV) programme, with the help and support of CSOs to examine the performance of products and services associated with environmental technologies.

2.5.2 Role of Civil Society Organizations (CSOs)

According to the World Bank (2007), CSOs are defined as "*Private organizations that pursue activities to relieve suffering, promote the interests of the poor, protect the environment, provide basic social services, or undertake community development*". Thus, CSOs are playing a vital role in influencing and shaping the behaviour of the society towards achieving a sustainable lifestyle.

CSOs play an influential role in promoting sustainable development, in-particular through **working in partnerships with the government and other stakeholders**, to serve the needs of communities. As a result of the cumulative experience gained by CSOs working in the environmental field, they had developed a better understanding of environmental problems, based on practical experience (Klein & Thoresen, 2009). They are developing efficient strategies to tackle and overcome environmental problems through building strategic networks and partnerships. However, the level and depth of partnership and engagement with government remains variable.

As mentioned in the first part of the literature, the term sustainable household consumption has a direct relationship with securing the needs and quality of life for households and individuals, through the use of services in a sustainable manner. Consequently, **addressing the main needs of the community** is considered a priority in the promotion of the SHWEC concept, through which CSOs can work and act upon. Moreover, CSOs have experienced and developed many partnerships with stakeholders in working to promote the SHWEC concept, including the work with government, the public and private sectors. For example, Norman et al. (1998) had documented the Greenpeace organizations support to the German refrigeration private companies to create the Green-freeze Refrigerator to overcome the CFCs problem and consequently, reduction of depletion of the ozone-layer.

Education is considered one of the most effective tools which are used by CSOs to promote sustainable consumption patterns. The Nordic council of ministries had developed with the help of CSOs the guideline for consumer education to help households in the assessment of the impacts of their consumption on the environment (OECD, 2008, p.26). Similarly, **Communication awareness campaigns** are also used by CSOs to raise the level of awareness among consumers. This was used for example in Denmark, where CSOs had conducted a series of **Consumption and Environment campaigns** through the use of multi-media methods with the help of the government to promote sustainable consumption behaviour in

the field of water and energy consumption (Didham et al., 2010). Finally, CSOs can work also on forming *Lobbying groups*, which tend to have a positive impact in reducing the strictness of environmental policies. This was reported by Riddel (2003), where the environmental political action committees had influenced the U.S. Senate elections and succeeded in promoting environmental advocacy towards forcing the government to improve the services provided and to introduce efficient way of consumption applications.

Finally, CSOs are working on tackling the concept of SHWEC through *pro-active partnerships*, covering supply and demand. *For the supply side*, CSOs are working with governments in identifying new strategies and innovations for tools to generate opportunities for achieving new ways of household consumption with a lower environmental impact. This can be achieved through working in collaboration with governments to address new technologies to produce new kinds of services with less harm on the environment. Besides covering *the demand side*, through creating new motives to households to consume less and/or consume with less harm to the environment. This includes tools such as; *media campaigns, advertising, and promoting sustainable education* as mentioned above (Kong et al. 2002).

To sum-up, the previous section is elaborating on the increasingly role of CSOs in working in collaboration with the government in promoting sustainable service consumption. This was done through identifying the possible role which CSOs can play in introducing this concept within the community, and the possible tools used for addressing such concept.

- Consumers International

(Source: Adopted from <http://www.consumersinternational.org/>, 2011)

Consumers International (CI) is the front-runner in the field of consumer rights. It is the first world federation of consumer groups. In the year 1960, CI was founded to work as the only autonomous and reliable international consumers' voice. More than 220 member organisations from 115 countries are building a powerful network and movement with the objective of helping and empowering consumers. The main objective and target of CI is to develop fair, safe and sustainable lifestyles for all consumers all over the world.

Recently, Hong Kong hosted the *Consumers International World Congress (CIWC)* in May 2011 (CI, 2011). The conference gathered the main key players affecting consumers in one round-table; Businesses, governments and CSOs *with the aim of* empowering consumers through supporting consumer movements related to the 10- year framework of sustainable consumption and production programme, before Rio+20 Earth Summit which is scheduled to take place in June 2012.

- Conclusion and Findings of CIWC

An increasing number of CSOs are keen to engage and influence local communities and households to transition their current consumption patterns and shift towards more sustainable life styles. The main problem which is facing CSOs is *the lack of power over decision making*, as the governmental support is not as strong as it should be, to help CSOs to promote their strategies. The following approaches which were raised from the conference are similar to the approaches developed by Peattie (2009) to increase the role of CSOs in promoting the sustainable consumption (SC) concept:

- *Empowering households*; through encouraging households to increase their power as one of the main stakeholders to promote SC, through campaigns for awareness raising which is considered a powerful tool to force changes. Such campaigns can help in creating new types of services that may drive new market demand.

- ***Focusing on the demand side (Consumers)***; in which consumer organizations can work in creating a green demand. Besides providing information on finding suitable ways to use services efficient. Thus, consumers are empowered to make informed choices.
- ***Addressing new green technologies***; in-collaboration with both government and companies for designing innovative ideas for greening the supply of services. This can indirectly change and reduce the negative impacts of consumption. In this case, households are considered passive in finding alternatives for more sustainable services options.
- ***Forming broad networks of all stakeholders***; encouraging stakeholders to act in-collaboration with a strategy that creates more influence to guide both households and market in a certain direction. CSOs should build new partnerships with other businesses and the government to highlight problems and find-out solutions that will work with more sustainable concepts.

To conclude, the success of the above mentioned approaches in bringing the change in the consumption behaviour will still ***depend on two important factors***. *Firstly*, ensuring that consumers and households believe that they are empowered to create the difference through their consumption and purchasing behaviour. *Secondly*, how to guarantee that the new ways of consumption will not affect the consumers' quality of life (Lorek, 2009).

2.6 International Cases

2.6.1 Think Twice: An action plan for Sustainable Household Service Consumption, Sweden: (Source: Government Communication, 2005: Ch. 3, pp. 15-24).

The Swedish Government launched "*the Action Plan for Sustainable Household Service Consumption (Think Twice)*" in the year 2006 through the Swedish Consumer Agency (Konsumentverket). *The main goal* of this action plan was to change the day-to-day service behaviour of the Swedish Consumers and increase their commitment towards sustainable service consumption. For the development of this plan, government worked in collaboration with many other stakeholders including the private sector, trade associations and CSOs in order to obtain a higher degree of progress in achieving the overall goal.

The *implementation* of the plan involved *the use of mix of control instruments and tools*, including three different groups of tools. The Government had assigned the Swedish National Board of Housing to provide a set of regulations on the issue of energy efficient housing system. They used a wide range of *regulatory tools* through the creation of standards for social and environmental responsibility, which include standards for efficient service use within households. *Economic Tools* were used by the Swedish taxation authority to review the taxation system and adding new environmental tax for the extensive use of water in households. They had reviewed the taxation system for the energy efficient home appliances with the help of the Swedish Consumer Agency to encourage consumers to consume energy in an efficient way. Finally, Government had worked with CSOs to *promote sustainable consumption education* through adding compulsory sustainable consumption subjects within schools, such as, '*home economics*' and '*consumer affairs*' and developing educational materials focusing on sustainable consumption topics.

Finally, the National government and local councils established administrative control authorities which play an important role in monitoring the implementation of the action plan. Each municipality has installed a *Municipal Consumer and Energy Advisory Body* which

reports directly to the higher administrative body. The main task of this advisory body is to work with the consumer protection organizations within the community in monitoring the implementation of policy tools. It is also responsible for the evaluation of the performance of these implemented policies through the use of the following set of six different indicators related to sustainable household service consumption;

1. The amount of energy utilization for heating and other electrical power use per unit area in single-family dwellings, multi-family dwellings and commercial buildings (*Sustainable energy use*)
2. The total number of energy efficient home appliances within the household (*Sustainable energy use*)
3. The amount of household waste (*Sustainable living*)
4. Total amount of water consumption per household (*Sustainable water use*)
5. Carbon dioxide emission levels in new cars (*Sustainable travelling*)
6. Household access to public transportation (*Sustainable travelling*)

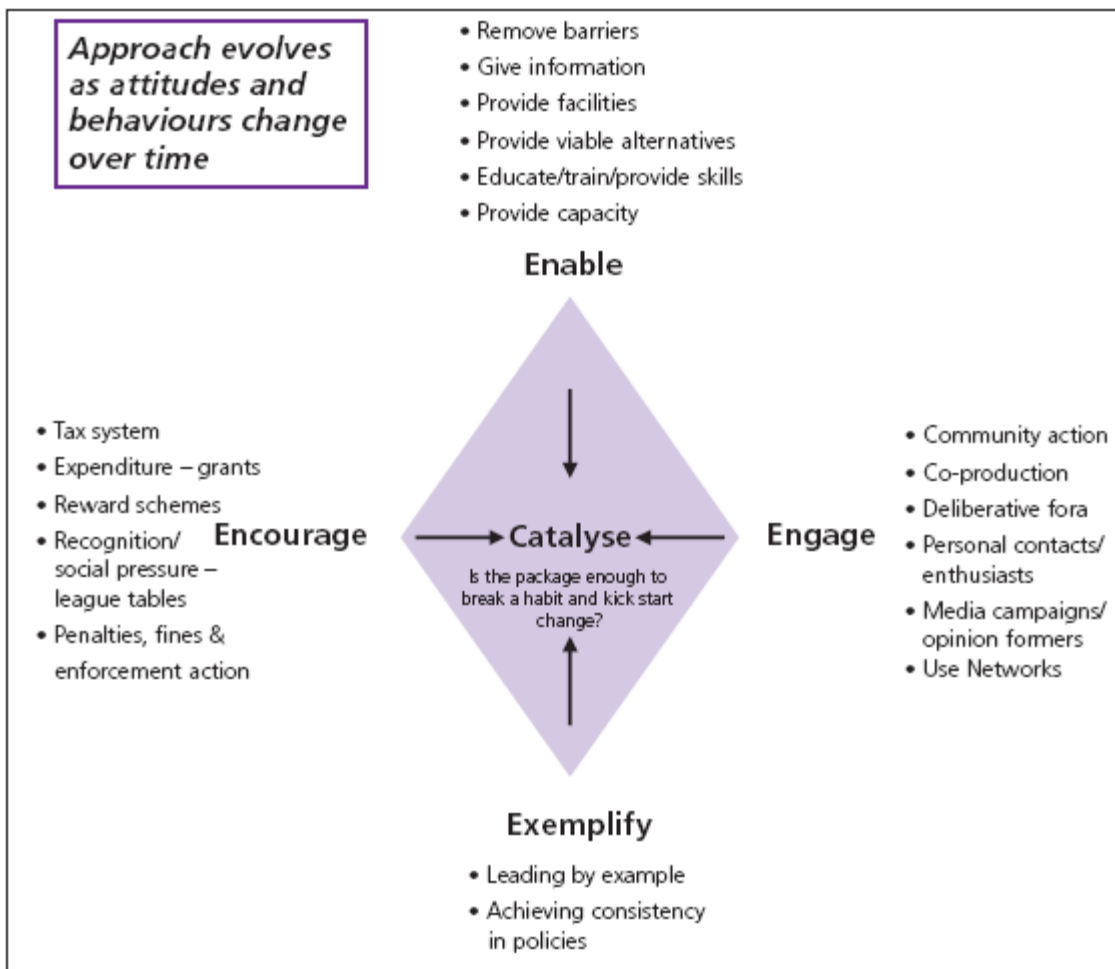
2.6.2 Helping people to make better choices; "The New Community Action 2020", program in England:

(Source: HM Government, 2005: Ch. 2, pp. 24-41)

The UK government's sustainable development strategy, initiated *the New Community Action 2020*, with the aim of adding fundamental shift towards sustainability regarding the way of consumers' service use behaviour. This is achieved through narrowing the attitude-behaviour gap of consumers towards sustainable service consumption by using the following five-point strategy:

- **Enable** – remove barriers that discourage sustainable service consumption through providing facilities and infrastructure that encourage sustainable service use. Improve the access of information regarding how to consume in a sustainable way and launching the school sustainable citizenship program with the help of NGOs to raise the awareness of local communities;
- **Encourage** – inspire the local communities to encourage them to consume in a sustainable way through the use of a taxation system and grants. Working on discouraging and penalizing negative and unsustainable behaviour, and enforce action for sustainable consumption;
- **Engage** – involve consumers, communicate and campaign, utilize media resources, stimulate community action with the help of NGOs;
- **Exemplify** – lead by example and achieve a policy consistency with the help of the national government.
- **Catalyze** – building from the previous four points, make major shifts in social and cultural habits to break old habits and kick start change.

Figure 2. 2: The UK Strategy for achieving the Sustainable Household Consumption Strategy



Source: Adopted from HM Government, 2005: Ch. 2, pp. 24-41

2.7 Combining Policy Instruments

After highlighting the factors influencing consumer behaviour towards service use, and the role of both government and CSOs in promoting SHWEC, an important question is raised; *how can policy instruments be used to promote Sustainable Household Water and Electricity Consumption?*. To answer this question, the next part of the literature attempt to illustrate the range of policy instruments which both governments and CSOs can use to tackle the factors influencing consumer behaviour.

Generally, government is asked to overcome the current problems and barriers which may face the applicability of the SHWEC concept, through using the term '*Leapfrogging*'. Leapfrogging is a term used by UNEP (2010) to describe the rapid change in the community lifestyle and the necessity of bypassing the ineffective and the polluting phases of development especially in developing countries by jumping to strategies which will help in implementing sustainable solutions and better quality of life. For example, *Eco-logical leapfrogging* was introduced by UNEP (2010) as an alternative to overcome unsustainable strategies in development to directly use new sustainable strategies with the help of CSOs.

When highlighting the two sets of factors (social and economic) covered in section 2.4 which influence consumer behaviour, we can find that both governments and CSOs can use a wide

range of policy instruments covered in section 2.5, to address *hard and soft measures* to influence these factors to promote SHWEC.

2.7.1 Soft Measures

According to Gust (2004), soft measures have *indirect influence and control* on the social factors of consumer behaviour. This include both *increasing the access of information* for consumers on the know-how to attain more sustainable behaviour in service use. Beside the *use of self regulatory instruments*, as government can work in co-ordination with CSOs especially with consumer organizations to give more attention to *voluntary* initiatives taken by households to increase their awareness on the consequences of their behaviour on the surrounding environment.

Voluntary initiatives are widely used nowadays in environmental policies. Such voluntary initiatives, are usually done with the support of CSOs and other civic groups, which support consumers by providing the know-how information and other types of support through small group meetings and the use of a *wide range of media campaigning* (Allely & Farah, 2003). These initiatives usually have a long-term impact on changing the consumption patterns and consumer attitudes toward environmental protection.

Accordingly, Dobson (2007) pointed that the use of these *soft measures* which target the behaviour changes towards more sustainable behaviour *is more likely to last* longer than any other kind of measures. Meanwhile, the UK strategy for achieving sustainable consumption as mentioned earlier had worked to remove the multitude of probable barriers for more sustainable consumer behaviour. Stern (2000) argues that CSOs can work directly on influencing the personal attitude towards environmental issues and that household should believe that they have the power to bring changes towards more sustainable consumption behaviour.

Consequently, the use of *Education for Sustainable Consumption (ESC)* can help in having a group of pro-environmentalist individuals which can help in addressing changes on the way of consumer behaviour. This was addressed directly by Didham et al. (2010) through the implementation of ESC initiative which encompasses the public environmental education strategy and participatory learning methods. It is founded on consumer advice groups to inform households of the options for consuming in a sustainable way in order to have a better understanding on the importance of sustainable consumption behaviour.

Additionally, Nakamura & Elder (2010) observed three main factors which are needed to be covered to reach the most effective policy tools. These factors can be illustrated as follows:

- ***The existence of pro-active actions*** through consulting and engaging stakeholders. This is considered a milestone in the build-up of passion to kick-off the formulation of new policies. Governments or CSOs (or both) can play the coordination role in this regards.
- ***The responsiveness to issues and concerns***, for receiving the support needed from all actors. This can be reached through developing new initiatives for changing consumer behaviour, addressing all the concerned issues by consumers such as the effect of such policies on the consumers' quality of life and raising their beliefs that their behaviour can introduce change to their current consumption patterns.
- ***The political support and availability of resources***, for policy implementation. The important role of having political support and available budget resources is considered very important for the success of policies. Stakeholders are asked in this regard to

work on having enough political support and to mobilize new external resources for policy implementation.

2.7.2 Hard Measures

Hard measures for influencing consumer behaviour can be used by government in the manner *as the carrot and stick principle* as I have mentioned before. This includes the use of *wide range of both regulatory and economic tools* to reduce the rigid barriers to sustainable service consumption. This range of policies can work on influencing the pricing system of services and introducing a new range of regulatory tools to bring new strategies for efficient service use (as mentioned in section 2.5.1). *Consumer protection policies* are considered as influential legislation which the national government can use to promote the SHWEC approach to increase the link between the consumer interests and sustainable consumption (Clark, 2006, pp. 492-498).

Cross-sectoral policies will provide a base for successful integration between different stakeholders, thus government role should be designing and implementing types of policy instruments which tackle the consumer behaviour, aiming at reducing the environmental impacts of services and sustaining the household consumption patterns (OECD, 2002).

On the National level (Macro level), government will still play the most powerful role in the development process, through the legitimacy of policies which is considered the main engine for achieving SHWEC. This kind of legislations will help in accelerating the implementation of sustainable policies with the involvement and engagement of stakeholders (Lorek, 2009).

Meanwhile, *local government* can play the role of monitoring the implementation of the SHWEC concept through using an assortment of tools which will help in achieving the targets of sustainable household service consumption on the local level. This assortment of tools can include a variety for the improvement of the regulatory instruments to encourage the adjustment of more efficient and sustainable ways of consumption which will effectively change the consumer behaviour, besides the creation of tax-based incentives for green and sustainable services (Kemp & Parto, 2005).

On the other side, the government can also help in achieving more efficient economic and environmental development through developing guidelines for local government (on the Micro level) to be function as a road map towards establishing more sustainable options for development which can enable and accelerate more market demand for sustainable services (Clark, 2006, pp. 492-498).

Furthermore, *governance for sustainability* on the local level is considered an important approach to include the merge of policies and programmes towards achieving environmental governance through the linkage between multi-disciplinary governmental bodies, addressing the environmental development challenges. This policy integration and interaction is not only between the governmental bodies (such as the financial, environmental and legal) but also with the non governmental bodies (such as Educational, environmental and advocacy CSOs) to reach the more effective sustainable consumption patterns (Spaargaren, 2011).

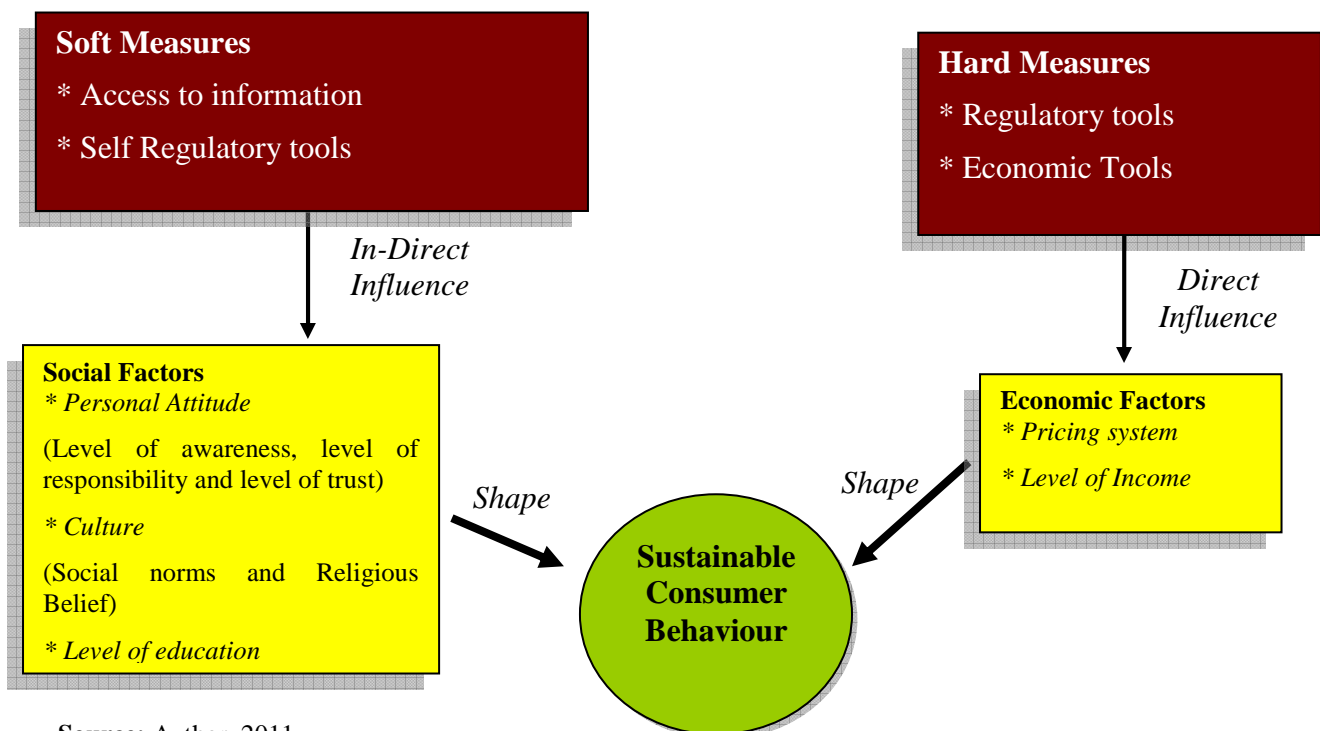
Finally, the creation of *sustainability-oriented framework* which can be used as a model to reach more transparent institutional model with the use of market oriented tools. Such innovative visions for sustainability will include the implementation of long term policies, knowledge and practices on both the governmental and the societal level. This innovation in the system will offer more sustainable environmental benefits and economic development (Kemp & Parto, 2005).

2.8 Conceptual Framework

To sum-up, the researcher in this chapter reviewed different factors for the motives behind consumers and households' behaviour, aiming to understand the service behaviour of consumers and households. The role of both governments and CSOs has been reviewed, together with two of the international cases in order to identify the most effective policy tools and instruments which can support the promoting of sustainable household service consumption.

Figure 2.3 shows the conceptual framework and the process of promoting the sustainable household water and electricity consumption.

Figure 2. 3: Conceptual Framework



Source: Author, 2011

Chapter 3 | Research Methodology

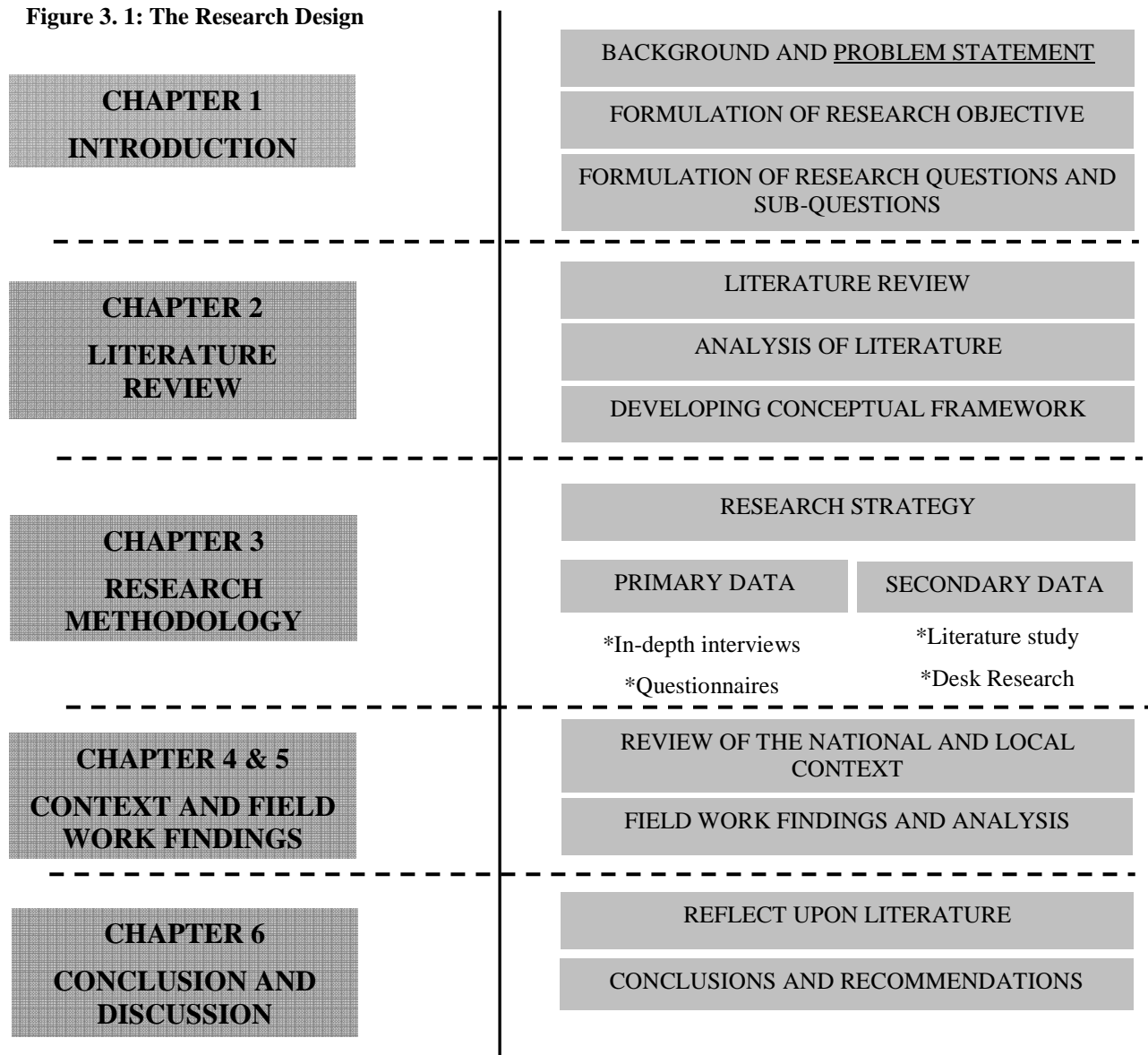
3.1 Introduction

This chapter gives elaborates on the research type and methodology employed and the research approach. It explains the research design, data collection methods, data sourcing, sampling techniques and analysis methods. A study area survey is implemented and an analysis was carried out to comprehend the underlying factors of household behaviour and their perception on the best set of policies to be used for promoting SHWEC. Subsequently, in depth interviews are conducted with **relevant stakeholders** from both government and CSOs, to reach the best set of policy tools to identify the most efficient and applicable SHWEC approaches.

3.2 Research Design

Figure 3.1 provide a brief summary of the research design, giving overview on the overall research.

Figure 3. 1: The Research Design



Source: Author, 2011

3.3 Research Type and Strategy

This is an exploratory policy-related research, which seeks to explore and investigate the possible role of government and CSOs towards shifting the community from unsustainable community towards more sustainable community through promoting Sustainable Household Water and Electricity Consumption policies.

This research is both qualitative and quantitative, as examines qualitative data collection, including related government documents, reports, and policies. It also deals with quantitative data collection based on the study area survey approach. In this research, a study area survey approach is used to analyze households' water and electricity consumption behaviour and their perception regarding the most appropriate policy tools to be used to promote SHWEC. The data will be gathered from analyzing the study area survey. The findings are analyzed in the light of desk research and in-depth interviews with the relevant stakeholders including governmental bodies and CSOs.

International cases which are relevant to the topic were covered in the literature review section before in order to present examples for similar cases through the use of desk study strategy.

3.4 Data Collection

Data collection is based on both primary and secondary data sources through different research instruments.

3.4.1 Primary Data Collection

Primary data will be collected in the fieldwork part of this research through the use of *in-depth interviews* with the main stakeholders, which includes the governmental bodies, and two different CSOs.

The *In-depth interviews* are in the form of semi structured interviews together with open ended questions. This kind of interviews is conducted to explore the view and perspectives about sustainable household water and electricity consumption policies with the relevant stakeholders listed in table 3.1.

Table 3. 1: Interviewed stakeholders

Interviewed Stakeholders	Relevance of Stakeholders	Number of Interviewees
<i>From the Government Side</i>		
The Holding Company for Water and Wastewater (HCWW)	The authority which is responsible for providing water services on the local level	2
The Egyptian Water Regulatory and Consumer Protection Agency (EWRA)	The agency responsible for regulating water service and protecting consumer rights	1
The Electric Utility and Consumer Protection Regulatory Agency (Egypt ERA)	Agency responsible for regulating electricity service and protecting consumer rights	3
Egyptian Environmental Affairs Agency (EEAA)	The national environmental affairs agency in Egypt which is responsible for environmental policies and regulations.	1
Consumer Protection Agency	The national agency in Egypt responsible to protect and raise the awareness of consumers.	1

<i>From the Consumer Protection Non Governmental Organizations</i>		
Water civil committee	Consumer protection organizations which works on protecting consumers' rights and raising their awareness.	1
The Egyptian Consumer and Energy Organization (CEO)		1
Total Number of Interviewees		10

On the other hand, another type for primary data collection was used in this research through the dispensing of *questionnaires* at a specifically-selected study area selected in Cairo city (El-Manial District). A sample of households are surveyed from El-Manial District divided into three main income groups; high, medium and low income groups. The survey focuses on viewing the factors influencing households' water and electricity consumption behaviour and their perception on how sustainable household water and electricity consumption should be promoted.

3.4.2 Secondary Data Collection

The secondary data collection sources include a study of the literature relevant to this field for the national and local context for the city of Cairo. The literature study is collected from books written on the subject at hand, journals, governmental reports and policy documents. A case study review of similar cases on the international level was reviewed in the literature study, as this part will help in the identification of the main lessons learned which can be taken as a framework for the strategy of better policy making.

3.5 Sampling Size and Technique

The study area, El-Manial district *was selected on purpose* based on the fact that this district includes the three income groups; high, medium and low income groups (CAPMAS, 2010). **120 household** are included in the sample which represent almost 2.5% of the study area total number of households. These are to be selected from the study area through the use of *stratified random sampling techniques*. The selection criteria for the households are based on their background in order to achieve the representativeness of the study area as follows:

- *Level of income; and*
- *Educational level*

Table 3. 2: Size of the population and the sample

Category	Number of households	Sample Size
High income group	2100	50
Middle income group	1700	35
Low income group	1200	35

Source: The number of households was taken from CAPMAS (2010).

Finally, the sample size for each group has been taken into consideration based on the representativeness of the group; therefore the sample per group is almost representing 2.5% of the total households within the group. The selection process for the surveyed households is taking every 4th housing unit starting from the beginning of the street in the selected area.

3.6 Pilot Test

Before conducting the survey with the local households, a pilot test is realized to ensure both the reliability and the clarity of the used questions. This test was done with 3 households in the study area. This pilot test also aims to eliminate the leading, invasive and provoking kind of questions.

3.7 Research Operationalization

Validity of the collected data was ensured through the use of different data collection methods. These methods vary between the use of literature review, a questionnaire and in-depth interview in the fieldwork. Information was collected from different sources to ensure that the collected data is valid. In the fieldwork, observations and notes was taken by the researcher to provide additional insights and to draw a clear understanding of the data collected from the questionnaires.

Reliability of the used sources was given high priority in this research. References were chosen from the most updated sources which include; journals, books and academic institutions publications and finally the use of internet sources. During the fieldwork, the interviewed officials and the surveyed households are selected according to their relevance with the research topic to ensure that the information given by them is reliable. Finally, the design of the questions was intended carefully to cover both the open and closed ended questions to ensure the accuracy of the collected data and answers.

Table 3. 3: Variables and Indicators

Main Research Question: 'How can Sustainable Household Water and Electricity Consumption (SHWEC) be promoted in Cairo City?'

Sub-Questions	Variables	Indicators	Data Type	Source of Data	Analysis Unit
'What are the current actions undertaken in Cairo towards sustainable household water and electricity consumption?'	Hard Measures	<p>Regulatory Tools:</p> <ul style="list-style-type: none"> *Service use standards <p>Economic Factors:</p> <ul style="list-style-type: none"> *Existence of Pricing Structure *Existence of Service use tax 	Qualitative and Quantitative Data	<ul style="list-style-type: none"> Desk research In-depth interviews Questionnaire 	<ul style="list-style-type: none"> *EEAA *Consumer Protection Agency *The holding company for water and waste water. *Egyptian Electricity holding company
	Soft Measures	<p>Self Regulatory Tools:</p> <ul style="list-style-type: none"> *Existence of Media campaigns *Educational tools for Sustainability *Lobbying 	Qualitative and Quantitative Data	<ul style="list-style-type: none"> Desk research In-depth interviews Questionnaire 	<ul style="list-style-type: none"> * CSOs * Local Households
'Which factors determine sustainable water and electricity consumption patterns in household in the City of Cairo?'	*Level of Awareness	<ul style="list-style-type: none"> *Believe that consumption affect environment *Awareness of existing service institutes * Awareness of existing campaigns * Knowledge on the know how to conserve 	Quantitative Data	Questionnaire	*Local Households
	*Level of Responsibility	<ul style="list-style-type: none"> * Taking environmental impact of consumption in consideration * Interest to join conservation practices 			
	*Conservation Behaviour Practice	<ul style="list-style-type: none"> * Following any conservation practice 			
	*Level of Trust	<ul style="list-style-type: none"> * Level of satisfaction with the current water and electricity service * Trusting the service provider agencies when conducting conservation campaigns 			
'What future approach should be taken for promoting SHWEC within Cairo city, as perceived by stakeholders?'	Hard and Soft measures	<ul style="list-style-type: none"> *Integration of hard and soft measures * Effectiveness and Acceptance of tools *Interaction between stakeholders 	Qualitative and Quantitative Data	<ul style="list-style-type: none"> Desk research In-depth interviews Questionnaires 	<ul style="list-style-type: none"> * Egyptian Environmental Affaires Agency *Consumer Protection Agency *The holding company for water and waste water. *Egyptian Electricity holding company *CSOs * Local Households

3.8 Study Area

Figure 3. 2: El-Manial District Pilot Area



Source: Google Earth, 2011

El-Manial district is selected as the study area to conduct the fieldwork questionnaire (Figure 3.2). As mentioned above, this district is selected based on the fact that it includes different income groups; high, middle and low income groups. According to CAPMAS (2010), the total number of population of El-Manial district is 25,000 inhabitants with a total of 5000 households. El-Manial is characterized by being a residential district with minor commercial activities located at the heart of the City of Cairo, which makes it ideal for conducting this type of fieldwork.

Moreover, and as indicated by CAPMAS (2010), the high income group forms almost 40% of the total household within the district, followed by the middle income group which forms approximately 35% of the total households. Finally the low income group form the remaining percentage of the households in the district forms 25%. The main spoken language in Egypt and Cairo as well is Arabic.

As a result, the questionnaires used and the interview questions were translated into Arabic to ensure that the main concepts and ideas of the questions are delivered accurately to the respondents. To achieve this, back translation methods were used to ensure the consistency of content and meaning of the translated questions with the English version. Consequently, it

was ensured that the questions used are easy to understand without the use of any academic words.

Figure 3. 3: Al-Manial district high income group housing



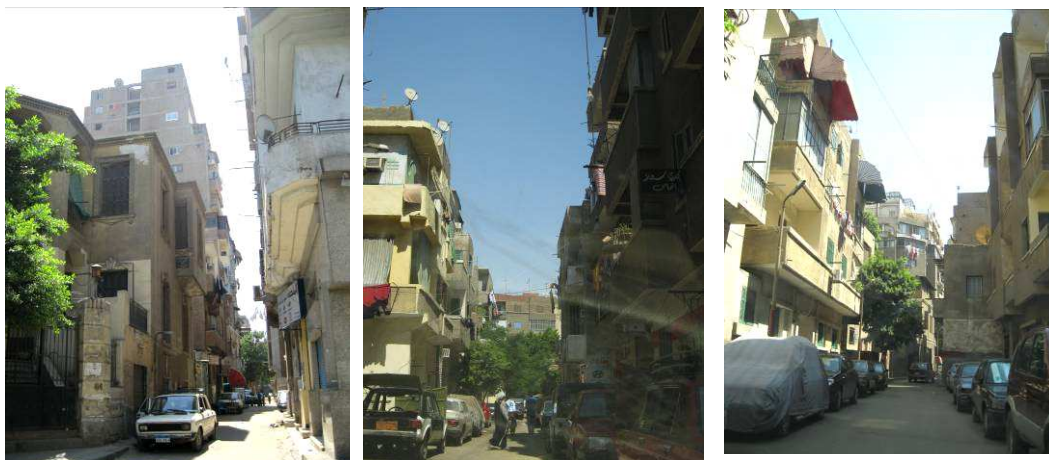
Source: Author, 2011

Figure 3. 4: Al-Manial district middle income group housing



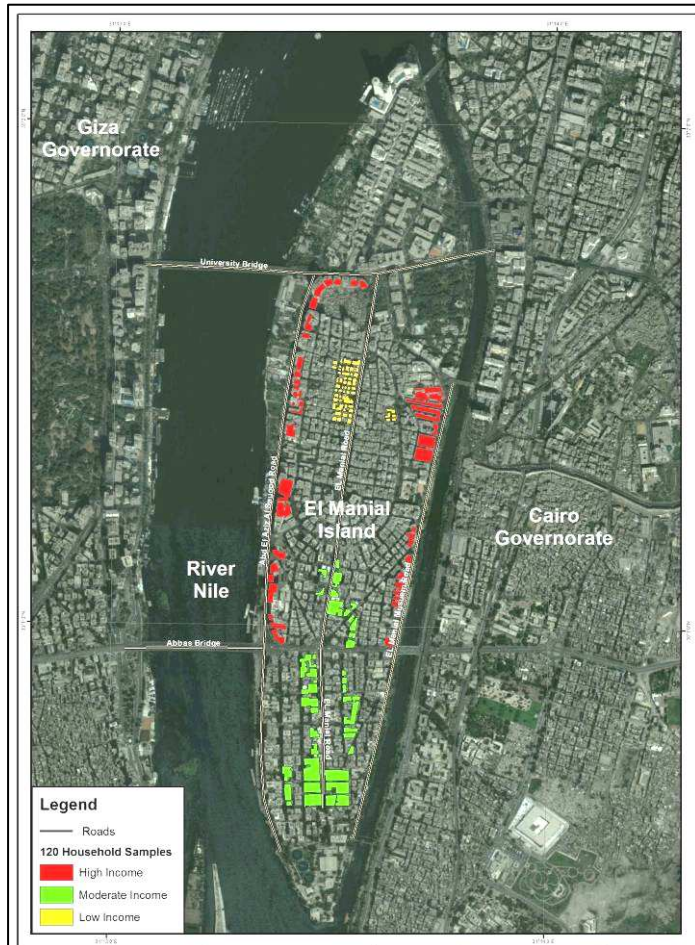
Source: Author, 2011

Figure 3. 5: Al-Manial district middle income group housing



Source: Author, 2011

Figure 3. 6: Surveyed households within the study area



Source: Google Earth, 2011

3.9 Time Scheduling

The field work plan was conducted approximately within one month, starting from the 1st of July 2011 till the 31st of July 2011. Here it is worth mentioning that the *In-depth interviews* were scheduled to start on the first week to explore the current actions undertaken in the context of SHWEC. From this point on-ward, the *questionnaire activities* took place within the 2nd and the 3rd week of the field work, with the aim of having a better understanding of the effectiveness of the current actions taken by the GoE and to know the perception of households regarding the most applicable SHWEC to be implemented by the government.

Finally, the information gathered from the fieldwork was used to continue the *in-depth interview* with the government and other relevant stakeholders in the 4th week to explore their visions regarding the best set of policy tools to be applied. Table 3.4 illustrates the time schedule of the fieldwork.

Table 3. 4: Fieldwork time schedule

Activities	Week 1	Week 2	Week 3	Week 4
Household Survey				
Stakeholders In-depth interviews				
Secondary Data Collection				

3.10 Data Analysis

In order to facilitate data analysis, data collection tools are designed in a structured way together with the research questions and the literature review. During the fieldwork, data is criticised by the researcher in order to find out the discrepancies as early on as possible and necessary adjustments are immediately carried out in the field. The collected data from the questionnaires is analyzed using SPSS techniques to facilitate data analysis. However, together with the in-depth interview questions, the survey questions are illustrated through the use of charts and frequency tables to analyse the data gathered. Observation notes are taken by the researcher on a daily basis and are gathered separately. Finally, observations are kept for the conclusion and recommendation part to provide additional in-depth comments.

Chapter 4 | Contextual Background

4.1 Introduction

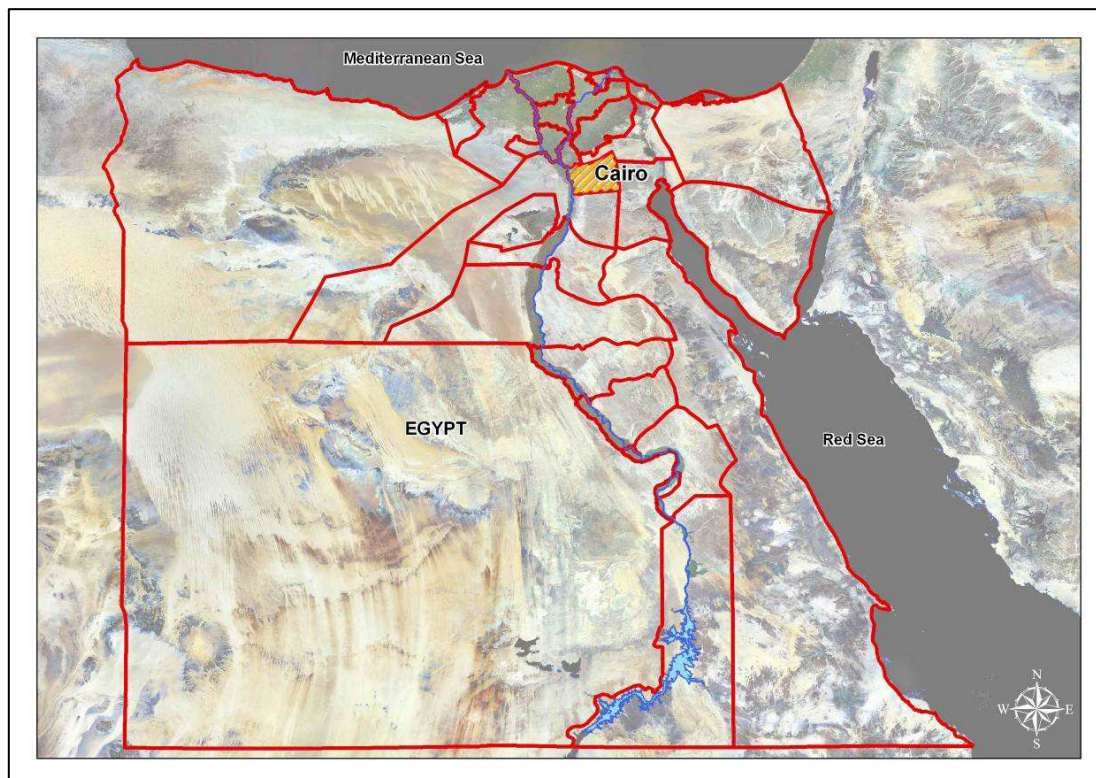
This chapter presents the local context of Cairo city. This contextual background is important to help the reader to understand the local situation of Cairo in a clear way. Chapter 4 is hereby answering the first research sub question. It reveals the effort done by the government and the Civil Society Organizations (CSOs) on the level of Cairo City, with regards to water and electricity consumption. It shows the current used instruments to help in promoting sustainable service consumption.

For doing so, different sections are being illustrated within the chapter. The first section covers the background information for the local context of Cairo, followed by presenting the relevant background to water and electricity household consumption patterns. The second section highlights the legal and the institutional setup for water and electricity service provision in Cairo city. Finally, the third section documents the current programmes and instruments undertaken by government and CSOs in relation to sustainable water and electricity consumption.

4.2 Cairo City Local Context

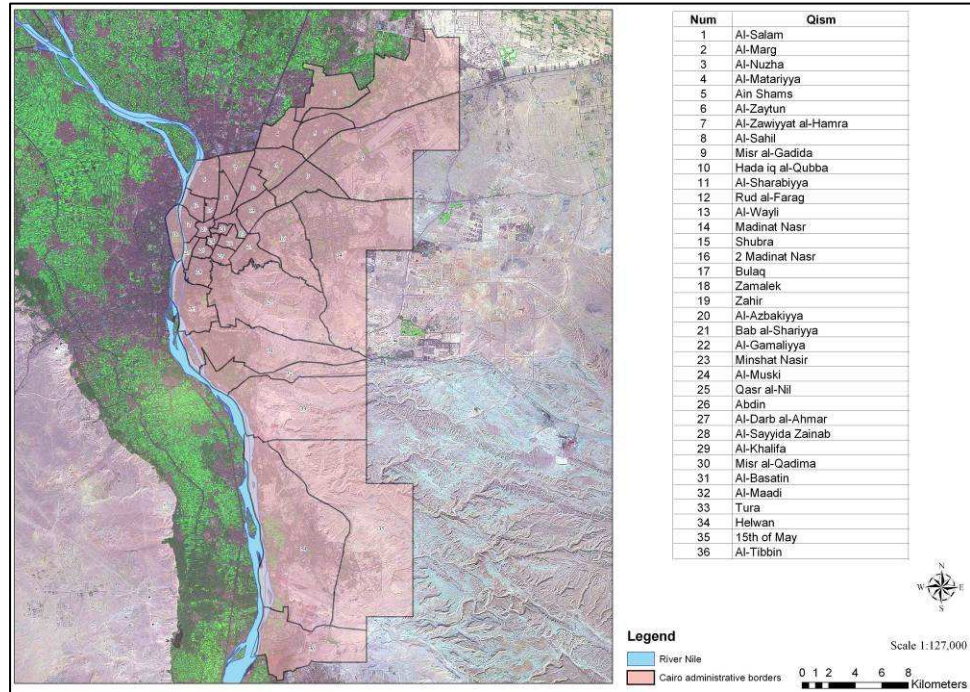
Cairo city is the capital of Egypt. It is located to the east of the Nile River, with a total area of 362.65 Km². According to CAPMAS (2010), Cairo is the most populated city in Egypt. The total number of population had reached 10 million inhabitants, counting 12% of the total population of Egypt. The city is composed of 36 districts; each one has its own physical context.

Figure 4. 1: Cairo City Location in Egypt



Source: UNEP, 2008

Figure 4. 2: Cairo City Districts



Source: UNEP, 2008

Unlike any other Egyptian city, Cairo is the most urbanized city with no rural area. According to CAPMAS (2010), the population density in Cairo has reached 18366 inhabitant/ km². In Cairo, the average household size is 4.5 people. Similar to Egypt, the average median age in Cairo is 24 years old.

With regards to economic context, the GDP per capita in Cairo city is similar to the average GDP per capita in Egypt, where it was estimated to be \$ US 2000 (CAPMAS, 2010). As a capital of Egypt, Cairo is the city where the majority of the country's economic and commercial activities are centralized. Its share in the national economy (GDP) was 31% in 2006 (UNEP, 2008). The industrial sector is the main active sector in Cairo as it contains considerable number of industrial facilities had reached 8180 facility (EEAA, 2008). These industrial activities are playing a leading role in providing job opportunities and booming the economic growth of the country.

As mentioned above, the majority of Egypt's development activities are centralized in Cairo city. These kinds of activities are resulting in **unsustainable consumption and production patterns**, with significance important on the environmental conditions of the city, including climate change, degradation of natural resources and biodiversity losses (UNEP, 2008). EEAA (2008), states that the rapid population growth in Cairo city will increase the load on potable water networks due to the increase of the rate of water consumption which will lead to deterioration of these networks. While for the energy sector, the excessive and unsustainable use of electricity within Cairo city had increased the level of greenhouse gas (GHG) emissions due to the increase of the use of fossil fuel in generating electricity which had reached 30169 kg / kg fuel of CO₂ emissions (EEAA, 2008).

From this section, we can conclude that Cairo city is currently facing a number of problems based on the fact that almost 12% of the Egyptian consumers are living in it. This had impacted negatively in the quality of water and electricity services provided. Yet, the unsustainable consumption patterns as mentioned above, will lead to more environmental and social problems to consumers.

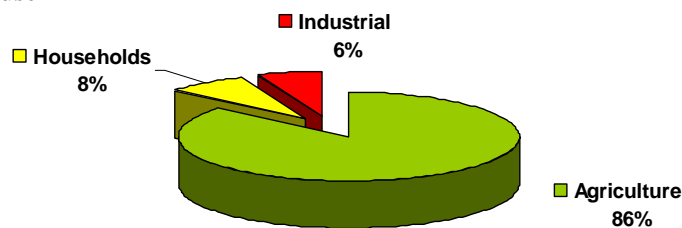
4.3 Water and Electricity Consumption Patterns

This part aims at giving a clear overview for the consumption patterns for water and electricity service use in Cairo city. Cairo can be taken as example for the life style of consumers in cities. This is considered useful to know what are the most used activities regarding water and electricity consumption within Egyptian cities. This will help later in identifying how sustainable service consumption can be achieved.

4.3.1 Water

On the national level, according to the annual report of EWRA (2007), the agriculture sector takes the biggest share of the water use, good for 86%, followed by the households and industrial sectors with 8% and 6% respectively. However, households sector is the main sector that highly invests in the field of water treatment practices with total investments reached \$ 4 billions till the year 2007.

Figure 4. 3: Water share per use

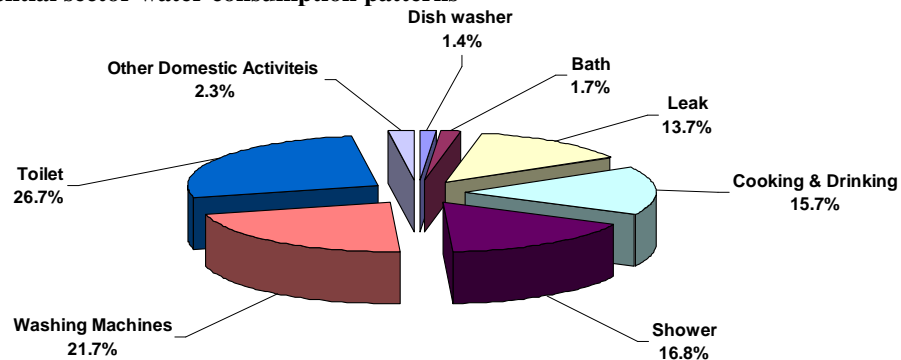


Source: water consumer agency annual report, 2007

The total amount of daily supplied water in **Cairo city** is 3910 thousand m³/day (EEAA, 2008). The main water source is the River Nile. Water share per capita in Cairo is 715m³/year, which counts 600 liter/day. The actual consumption rate according to EWRA per capita is 140 liter/day. The current water share per capita in Cairo and Egypt is considered less than 1000m³/year which is the global level of water scarcity. This means that Egypt may face water scarcity problems within few years.

A study conducted in the year 2010 on residential consumption patterns by HCWW, reveals the daily water use activities within households. As shown in the figure below (figure 4.4), toilets flushing and washing machines are good for nearly 50% of all water consumption activities at the residential level. On the other hand, the figure shows that almost 13.7% of the water consumption is being wasted in leaks. This implies that a considerable percentage of water can be saved through having regular maintenance on the networks within households. However, this shows that households' are not keen to maintain their own water connections.

Figure 4. 4: Residential sector water consumption patterns

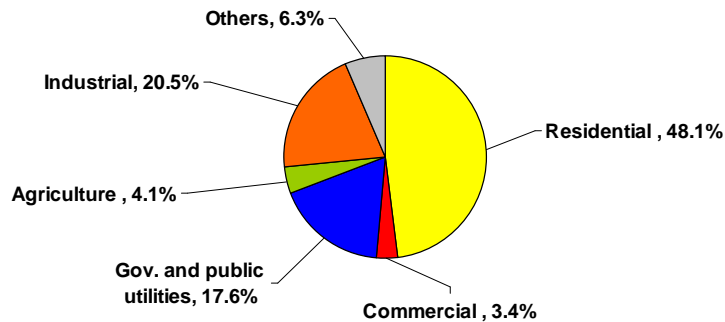


Source: Holding company for water and wastewater, 2010

4.3.2 Electricity

On the national level, the residential sector has almost half of the share of electricity consumption which reached 48.1% of the total electricity consumed in the year 2010. Then it is followed by industrial and governmental activities with 20.5% and 17.6% respectively (figure 4.5).

Figure 4. 5: Electricity consumption per sector



Source: Egyptian Electricity Holding Company annual report, 2010

Within Cairo city, according to EEHC (2010), the average electricity share per capita is 2100 kw/ hour. A study on the residential sector consumption patterns was done by EEIGGR in the year 2000, indicates that lighting was having the high share for summer and winter monthly consumption pattern with 32% and 42% respectively, followed by the refrigerator appliances with 20% and 12% respectively (figure 4.6 and figure 4.7).

Figure 4. 6: Summer consumption patterns

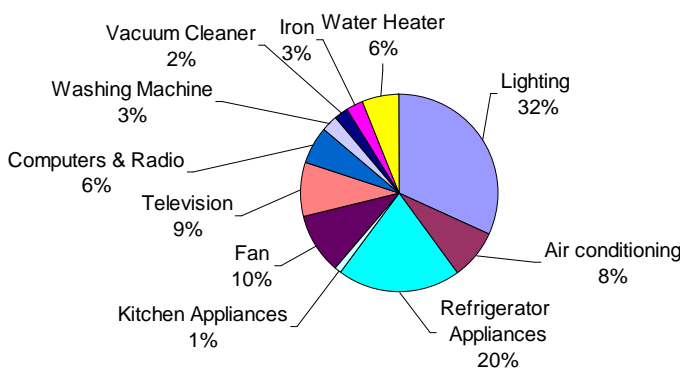
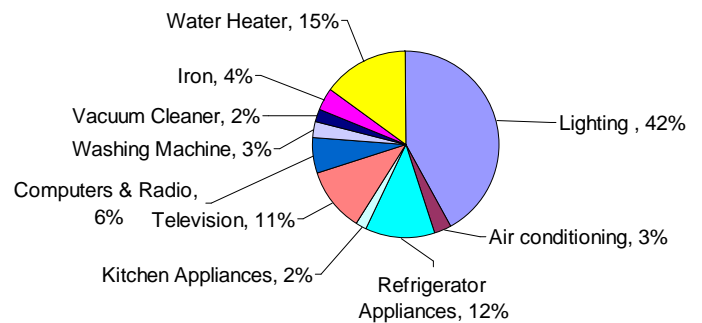


Figure 4. 7: Winter consumption patterns



Source: Residential Energy Survey and Environmental Indicators in Greater Cairo, 2000

Although this study was conducted 11 years ago, it gives a general idea for the main consumption patterns within households in cities (urban areas). In this regards, it is clear that the consumption patterns differs from summer to winter in a hot city like Cairo. This is clearly shown with air conditioning and fans activities which are increasing in summer rather than in winter. Similarly, water heater activities increase also in winter rather than summer. However, it is assumed that these patterns had changed during the last years due to the increase in the welfare and the appearance of energy saving appliances which start to be used in Cairo since the year 2008.

4.4 Legal Context of water and electricity Services

The national government of Egypt has enacted and issued a number of regulations and laws with regards to water and electricity service provision. These laws controls and govern service provision all over Egypt. These include among others:

- Environmental Law

The first law for protection and conservation of environment in Egypt was issued in 1994; (Law 4/1994). This law acts as an umbrella for all actions regarding protection of the environment. Chapter 2 of the law states that the body responsible for environmental protection should work in close collaboration with other national and international organizations beside the civil society organizations in setting and implementing initiatives and strategies in relation to sustainable development. This law lacked to touch upon what is the level of coordination which should be reached in regards to sustainable service consumption. In other word, the law is not backing and pushing sustainable consumption as the coordination activities mentioned in the law are left to be voluntary and not compulsory activities.

- Consumer Protection Law

The first law for consumer protection was issued in 2006 (law 67/2006). '*Consumers*' according to the law are any person to whom a product is offered to satisfy his own or his family needs. The law defines the term '*products*' as any service and goods provided to consumers. Article 9 of the law obliges all services and product providers to offer all the required information regarding their products and services to consumers. The duties and the mandate for the consumer protection agency have been formulated in article 12 of the law. Article 23 of the law states that the consumer protection agency should work in collaboration with the civil society organizations to raise the awareness within consumers regarding their rights and their duties regarding all provided products and services in such a way that supports the enhancement of the quality of products and services provided. However, this law is not enforced in the field of services provision and it focuses only on improving the quality of goods provided. This shows that the law is lacking the actions needed to be enforced in order to reach consumer protection in the field of services provision.

- Water Law

Currently, there is no overall water law or regulation that steers sustainable water use. There are however a number of laws which was issued in relation with water service use in Egypt. The first law to identify and regulate the available resources for potable water was issued in the year 1978. This law identifies the required technical and health conditions for preserving and protecting potable water from pollution. Later in the year 1981, the "*national authority for water and wastewater*" was established to be the only body nation wide to provide water service and setting policies and plans in relation to water and wastewater projects. This body have the authority to supervise the implementation of projects and coordinate with local government in monitoring such projects. The "*national authority for water and wastewater*" was restructured to be the "*holding company for water and wastewater*" in the year 2004. Finally, the first water service consumer protection body (EWRA) was founded in the year 2004. This agency was meant to work on improving the quality of service, ensuring and protecting

consumers' rights regarding water and wastewater service use¹. Nevertheless, all these laws failed to identify the duties and tasks for consumers regarding how to use water in a sustainable way or even to ban the excessive use of water.

- Electricity Law

Similar to water, there is no one law to regulate or steer the use of electricity service. However, there are a set of laws which was issued in relation to electricity service use in Egypt. The "*Egyptian electricity authority*" was established in the year 1976, to be the only body responsible for providing electricity service and setting policies and plans in relation to energy. This authority was restructured to the "*Egyptian electricity holding company*" in the year 1991, formulating its responsibilities and mandates. In the year 1997, the electricity consumer protection agency (Egypt-ERA), was founded to work on improving the quality of service, ensuring and protecting consumers rights regarding electricity service use². Yet, all these laws did not identify the way to use electricity service and the duties for consumers to use the service in a sustainable way.

4.5 Institutional setup for water and electricity services

Before going in details in this section, important information should be highlighted. Egypt is considered a highly centralized country, where the central government has all decision making power, strongly controlling actions of local authorities. In this regard, the local government has limited power under the current administrative system in Egypt. The same system applies for services provision agencies, which is centralized, to provide and govern service provision for the whole of Egypt. However, the national services agencies have sub agencies in cities for the provision and implementation of services within their jurisdiction. The following governmental bodies are the main identified bodies related to water and electricity service provision at the national level.

A. Egyptian Environmental Affairs Agency

In the year 1982, Egypt established the first environmental agency "Egyptian environmental affairs agency" (EEAA). The agency is considered the only governmental and coordinating body for tackling different environmental issues, through the coordination between all the national and international bodies. This is to ensure that sustainable development issues are included within their plans and strategies. The agency is the responsible body for issuing the annual state of environment (SoE) report, including all the necessary plans and actions required for environmental protection. In regards to service use, and according to its mandate, EEAA should work on implementing sustainable development policies with other governmental bodies. This also includes the work on achieving sustainable consumption in the field of service provision. However, the main priority for EEAA currently is to focus on improving the environmental conditions within the industrial sector, and not giving attention to sustainable consumption within the residential sector.

¹ This paragraph was developed from laws; number 27/1978, 197/1981, 135/2004 and 136/2004.

² This paragraph was developed from laws; number 12/1976, 203/1991 and 326/1997.

B. Consumer Protection Agency

The consumer protection agency, was established by the law number 67/2006. The main aim of the agency is to ensure consumers protection, to help in improving the growth of the national economy. The agency is working in collaboration with the national bodies and civil society organizations to raise consumers' awareness on the know how to gain their rights. This will help in improving the quality of goods and services use. Yet, the agency's main focus is to protect consumers' rights through forcing the private sector on providing a good quality of goods and products. The agency does not cover the issue of services provision quality, although it is part of its mandate according to law. This is based on the fact that both the service providers and the consumer agency are all governmental bodies and currently there is no any framework to regulate the level of coordination between these different governmental agencies.

C. Water service provision agencies

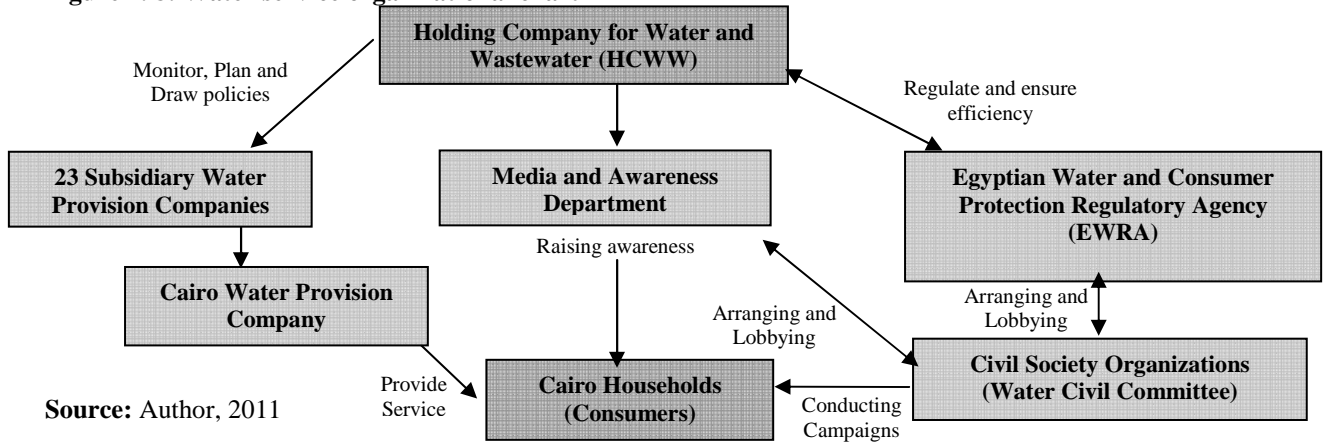
- Holding Company for Water and Wastewater (HCWW)

The holding company for water and wastewater established by the presidential decree number 135/2004. According to law, the holding company is the only service provider in Egypt. The main role of the company is to purify, desalinate, and provide potable water to consumers. Besides collecting, treating and disposing wastewater. 23 different local companies are affiliated to the holding company to manage and provide water and wastewater services within cities. The holding company has 5 strategic objectives to be implemented; consumer protection and raising awareness, providing service to consumers, improving and enhancing the quality of service, improving the financial and managerial balance and building the capacity for the company staff. The media and awareness department is the department responsible for adding the environmental concern within the agenda of the water sector in Egypt. In this regards, the department develops annual action plan to bring the civil society organizations (CSOs) into actions to ensure the achievement of the holding company overall objectives.

- Egyptian Water and Consumer Protection Regulatory Agency (EWRA)

The agency was established by the presidential decree number 136/2004, affiliated to the ministry of housing. The main objective of the agency is to upgrade and improve water and wastewater service use, through achieving the balance between both parties; service provider and consumers. This objective is planned to be achieved through following the principles of transparency, efficiency and protecting consumers' rights. Accordingly, EWRA works as regulator on HCWW to ensure the efficiency of services. The main message of the agency is to ensure the availability of service with high quality and affordable price consistent with the state policy, having the commitment of protecting public health and environment. The agency is working in coordination with the holding company in achieving a good quality of services and to analyze the current service provision system in order to improve it with the help of the civil society.

Figure 4. 8: Water service organizational chart



D. Electricity service provision agencies

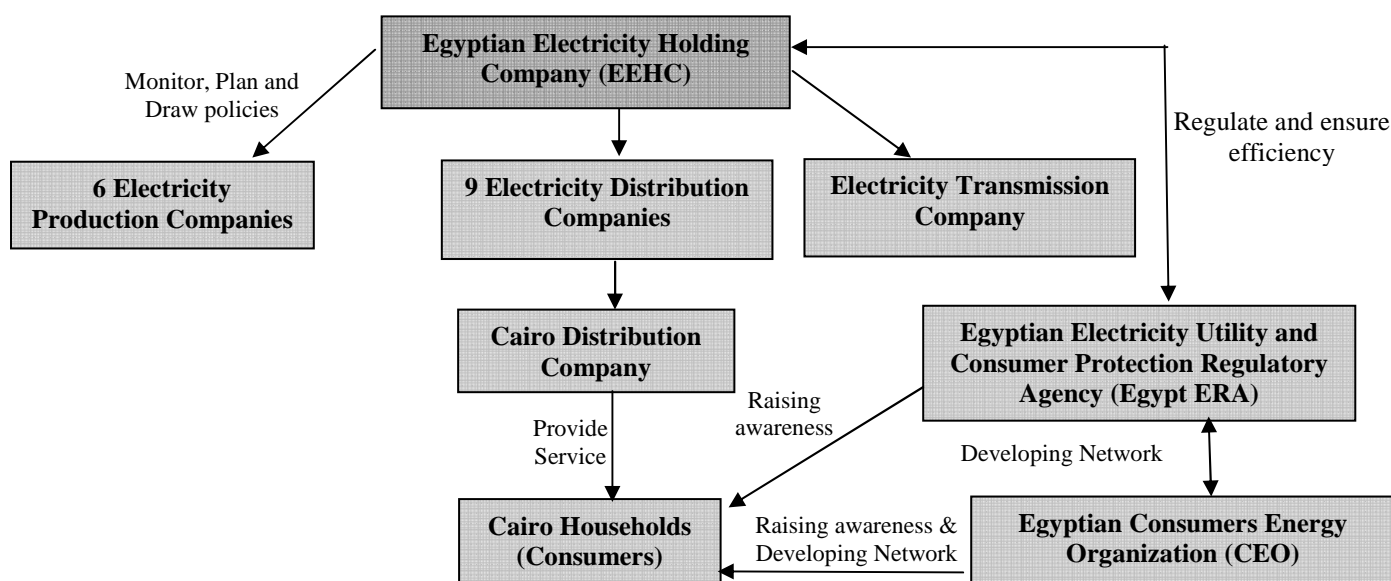
- Egyptian Electricity Holding Company (EEHC)

The Egyptian electricity holding company was established by the law number 203/1991. According to law, the holding company is the only service provider in Egypt. The holding company was established with the aim of improving the electricity service through separating the production, distribution and the transmission of the service throughout establishing separate companies for each activity. The main role of the company is to improve the service use through providing continuous supply for electricity service to consumers, taking in consideration all the economical, social and environmental sustainability of the service.

- Electricity Utility and Consumer Protection Regulatory Agency (Egypt ERA)

The agency was established by the presidential decree number 326/1997, affiliated to the ministry of electricity and energy. The agency's objective is to regulate and review all the electric power consumption and distribution activities, in a way to reach sustainability of the energy sector in terms of social, economic and environmental sustainability. The agency is issuing annual reports, to help electricity consumers to know their rights and obligations, in the framework of complete transparency. The awareness and consumer protection department is considered the only department to work on adding the environmental concern within the agenda of the energy sector in Egypt. In this regards, it works in coordination with the civil society organizations (CSOs) to bring the community in action regarding the environmental concern.

Figure 4. 9: Electricity service organizational chart



Source: Author, 2011

4.6 Programmes on water and electricity service consumption

This section highlights the current undertaken programmes aiming at improving water and electricity service provision. All the data shown within here is covering the national level for Egypt which includes Cairo city as well. This section gives a description for each programme, including objectives and activities. The main outcomes and results of these programmes are illustrated later in section 4.7 and 4.8, as the programmes outcomes are used as instruments by the government to improve the efficiency of service supply.

A. Water Sector Budget Support Programme (WSBSP)

As a part of the EU Water Initiative (EUWI), which was launched in the world summit for sustainable development in 2003, a total budget of Euro 80 millions was allocated to launch the water sector budget support programme. The programme is working on three phases with duration of 36 months, starting from 2006 till 2009.

- Objective of the programme:

The overall objective is to transform the national water resources into significant factors of the sustainable growth of water services. This works on improving the efficiency of water quality and management, besides developing a strengthened framework for water sector finance planning and monitoring.

There are three different components of the programme as follows:

Component A (Fiscal Decentralization)

Improve efficiency and performance on the fiscal and financial sector. This was done through working on achieving the fiscal decentralization of the budgeting of water local companies.

Component B (Integrated Water Management)

This component includes, adjusting the legal framework that manages the water sector. Preparing action plan for raising the public awareness on the values of water and improve the way of water consumption. Engage the private sector in promoting private public partnership (PPPs), to improve the water quality and service use.

Component C (National Water and Wastewater Master Plan)

This includes restructuring and updating the national master plans. As well as improving the statistical framework for the service provision. Transform the local service provider companies into financial autonomous commercial enterprises.

B. Energy Efficiency Improvement and Greenhouse Gas Reduction (EEIGGR) Project

The energy efficiency improvement and greenhouse gas reduction (EEIGGR) project is financed by the Global Environmental Facility (GEF) and the United Nation Development Program (UNDP). This project was done as a mean of coordination between the ministry of electricity, GEF and UNDP. Phase I of the project started in the year 2000 till 2010. Phase II of the project starts from 2011 and will end by 2016.

- Objective of the project:

Energy conservation and improving efficiency to reach the target of CO₂ reduction by 11.73 MTons and saving 4.2 MTOE³ of energy generated.

- Components of the project:

- Reduce the loss in the transmission system from 7% to 5% through improving the dynamic response for generating units as well as load shifting.
- Encourage the use of energy efficient appliances and the use of energy efficient bulbs in both the residential and government sector. As well as, the preparation of the energy efficiency code in new constructed buildings.
- Establish the energy efficiency center for information dissemination among energy consumers and other stakeholders.
- Encourage the implementation of cogeneration projects and their parallel operation with the electric networks.

C. Joint Committee for cooperation on renewable energy and energy efficiency and environmental protection (JCEE)

In the year 2007, Egypt and Germany had agreed to setup the Egyptian German High Level Joint Committee for Energy Efficiency (JCEE). Their main aim is to cooperate on renewable energy, energy efficiency and environmental protection. This committee is planned to be the main platform for energy policy discussion. A number of initiatives have been launched through the committee for activities in relation to awareness and capacity building.

-Objective of the Committee:

To contribute and secure energy supply in Egypt, with the aim of improving living conditions and protecting the environment, as a mean to support the economic development of the country, based on ensuring environmental sustainability.

-Tasks of the Committee:

The committee's main task is to assess and guide the Egyptian national energy planning through providing activities in regards with; awareness raising, community engagement and training and education in the field of energy efficiency.

³ MTOE = Million Tonnes of Oil Equivalent

4.7 Government Instruments for Sustainable Water and Electricity Consumption

This part illustrates the undertaking instruments by the government in relation to water and electricity. Information below were derived from the in depth interviews with governmental bodies. Annex 1 includes all the interviewed officials from the government. Annex 2 displays the questions used during the interviews.

The instruments used by the government are divided into **hard and soft measures**. As was indicated in literature in chapter 2, **hard measures** are only used by government to have direct influence on the consumers' service use behaviour. This includes the use of *wide range of* both regulatory and economic tools to reduce the significant barriers to sustainable service consumption. On the other hand, **soft measures** are tools used by governments to have an indirect influence on the behaviour of consumers. This includes awareness campaigns, education for sustainability and lobbying. Therefore, this part presents the hard and soft measures which are currently undertaken with regards to water and electricity service consumption as follows;

4.7.1 Water Sector

This part provides an overview of the current used hard and soft measures by government, as follows:

A. Hard Measures

- **Regulatory Tools**

During the interview with officials from HCWW, it was revealed that the main outcome from the WS BSP Programme is **to compile all regulations** in relation with managing the water sector **in one law**. The new law includes clear articles to deal with the need to conserve the use of water in the residential and the government sector. This kind of articles includes banning the use of fresh water in gardening, washing cars and cleaning streets, as it is part of the Egyptian culture to use fresh water in washing cars and cleaning streets. Accordingly, new articles are added to compile the holding company to give regular maintenance activities on checking the water connections within houses to eliminate water leakage. And penalize the excessive use of fresh water through paying fines for the excessive use of water.

The new law is not yet enforced. It has already been drafted and currently is awaiting the approval before it can be taken into action.

- **Economic Tools**

- **Pricing Structure for Water service use**

The water law number 27/1978, states that a water meter should be installed in any building connected to a public water service. In this case the cost of service is being divided by the number of households within the building. However, nearly all slum dwellers within Cairo city, accounting for 15% of the total households within Cairo, are illegally connected to water without having any water meter to charge them. They are illegally tapping water from the nearest source of fresh water. Participatory observations and interviews with low income households in the study area revealed that indeed illegal connections exist, whereby water is being tapped from a nearby school.

Currently, the actual cost for producing and delivering 1m³ of potable drinking water is 1.10 Egyptian Pound (EGP)⁴ for operation and maintenance excluding the labour cost. This tariff is heavily subsidized for the residential sector, and divided into **two pricing segments**. The first one is 0.24 EGP/m³ for the first 10 m³, while the second one is 0.50 EGP/m³ for the remaining water consumption.

Officials pointed that water service is considered the cheapest service provided in Egypt compared with other utilities. The current subsidy system is not encouraging sustainable water use. It is currently being reviewed by the statistical department of EWRA in order to add justice to the system and to improve the quality of water service. It was further stated that fees collection system is facing problems. The current collected revenue from the service only covers 12% of the total revenue.

- Water Service use tax

Currently, there is no any kind of water service use tax, where the respondents had mentioned that adding a service use tax is not widely accepted in the Egyptian culture.

"...Based on the economical context of the Egyptian culture, the use of a water service tax is considered an added burden to the consumers. They will not be widely accepted and is therefore not put into action..."

(Personal Communications with director of financial analysis department, HCWW, Egypt, July 2011)

B. Soft Measures

As mentioned before, HCWW was founded in the year 2004. The first strategic objective of the company is to ensure the protection of consumer and awareness raising. The holding company informs consumers on activities regarding water sector reform in Egypt and also aims to improve the quality of water services through efficient use of water resources.

Consequently, and based on the awareness raising objective, the Water Sector Budget Support Programme (WSBSP) facilitates the establishment of the media and awareness department in 2006. The department formulated the media and the awareness strategy for HCWW, involving the following strategic objectives:

- To raise the consumers' awareness on the need and the importance of adhering water conservation practices;
- To establish partnerships with communities and consumers organizations.
- To increase the access to information on water treatment processes in order to create responsibility among consumers.

The interview with the officials of the media and awareness department focused on assessing the progress made with regards to achieving the above objectives set for sustainable water consumption.

• Media Campaigns

The Holding Company developed a number of **leaflets and publication materials** related to raising consumers' awareness of on the need for water conservation. This also includes posters and advertising materials. The targeted groups for media campaigns are the residential and the governmental sector.

⁴ Currency convertor, 1.00 USD = 5.95250 EGP, September 2011

The department also created the **Egyptian conservation community group** on Facebook. The aim of this group is to bring concerned parties together and enable communications on the topic. These parties include individual consumers, organizations and other groups concerned with water conservation in Egypt. A point was observed by the researcher, that the total number of people joining this group was less in number, not exceeding 560 members. The group contains very useful advertising materials on how to conserve water, as well as data on the water sector in Egypt. Figure 4.10 provides examples of posters used and the Face-book group page.

Figure 4. 10: Water conservation materials



Source: Media and awareness department, 2010

In addition, the media department started a new media campaign in 2009, involving the use of cell **phone short message services (SMS)**, to increase awareness among consumers. Some of the SMS messages are displayed below:

"The water drop you waste will never come back"...
"Water is the source of life, please maintain it..."

(Personal Communications with director of media and awareness, HCWW, Egypt, July 2011)

However, it was observed by the researcher that no feedback from the department was given to measure the performance of the above mentioned activities.

- **Educational Tools for Sustainability**

Officials from HCWW indicated that a **partnership** with the Ministry of Education has been developed in relation to water conservation. Accordingly, a **curriculum was developed** to include themes on water conservation, with the aim to target students and households in preserving water. The curriculum has so far been tested in 5 different schools in Cairo and Giza city, with 1000 students from the primary 4th and 5th grades. Teacher's guides were developed for almost 25 teachers as well with the same above mentioned themes. The program includes the following activities:

- Design of educational materials, booklets, toys and colouring books for children.
- Visiting tours to water treatment plants to create a better understanding on the phases of water treatment.

Figure 4. 11: Children making use of the educational materials



Source: Media and awareness department, 2010

- **Lobbying**

Taking into consideration the religious nature of the Egyptian society, HCWW started to **involve 200 religious leaders** from both the Muslim and the Christian community. The main target of this approach is to establish a water conservation network to disseminate and promote the message of efficient water use. Accordingly, religious leaders are playing a key role in promoting such messages during the religious gatherings on Fridays for Muslims and Sundays for Christians. Examples for water conservation in Islam and Christianity are displayed below;

*"...In Islam, the 'prophet Muhammed' had said in his holy words;
 ..."Do not go overboard in the water, even if you're living on river"...* "

*"... In Christianity, God says in the holy bible;
"And the Spirit of God was hovering over the water"*

Table 4. 1: Summary of government used instruments in water sector

Governmental Bodies	Hard Measures		Soft Measures		
	Regulatory Tools	Economic Tools	Media Campaigns	Education for sustainability	Lobbying
- Holding Company for water and wastewater (HCWW) - Egyptian water consumer protection regulatory agency (ERWA)	- Issuing the new water law, include articles to promote conservation	- 2 different tariff structure system - Review the current tariff system and develop a plan for subsidy removal	- Creating the Egyptian Water Community on facebook -Posters and advertising materials on conservation practices -Awareness cell phone SMS message campaigns	-Design educational materials and booklets -Developing teacher guide -Conducting workshops with 5 schools and 1000 students	-Working with 200 Muslim and Christian religious leaders to form the water conservation network

Source: Author, 2011

4.7.2 Electricity Sector

This part elaborates an overview of the current used hard and soft measures by government, as follows:

A. Hard Measures

- **Regulatory Tools**

Officials from Egypt ERA stated that the agency has drafted a **new law** for managing the electricity and energy sector. This new law includes clear articles addressing the need for energy conservation in the residential sector. The law addresses among others, the use of energy efficient bulbs in households in order to reduce the level of energy consumption. This article was added as response to the electricity study on households' consumption patterns, as the lighting activities is found to be the main electricity consumer.

In depth interview was conducted as well with the EEIGGR project officials. They mentioned that, the residential sector consumption patterns study conducted in the year 2000 (the study findings were presented in section 4.3.2). It was found that the lighting and refrigerator home appliances are the most energy consumer within households. According to that, phase I of the project had **distributed 9 million efficient bulbs** within Greater Cairo to replace the incandescent bulbs to improve the energy consumption patterns within households.

The project has also issued and published **guidelines for energy labelling** for appliances. This includes; refrigerators, air conditioners, washing machines and water heaters. In 2009, the minister of electricity and energy issued a ministerial decree to oblige producers of home appliances to follow these guidelines. Through this decree, they are obliged to manufacture appliances that consume energy in a more efficient way, besides adding labels which shows the energy consumption for their products. The decree furthermore indicates that all imported appliances should include certificates ensuring their energy efficiency. However, the project director pointed to the importance of informing consumers with the benefits of these appliances.

"...The main issue regarding the energy labeling guidelines is to inform the appliances dealers about the benefits of energy efficient appliances, so that they can promote it in a good way to consumers..."

"...We are aware of the fact that, dealers often don't know the benefits of these appliances. In one particular case, a dealer informed us that he considers the energy label purely as a promotion method for producers ...This kind of ignorance has in the long run a negative impact on the consumers"

(Personal Communications with director of EEIGGR project, Egypt, July 2011).

In addition, EEIGGR project also developed an **energy code** for residential and governmental buildings since 2009. This code includes energy standards that are compulsory for all newly constructed buildings to ensure efficient use of energy within these buildings.

Finally, a question was asked if there is any kind of **feedback and monitoring** action were conducted to measure the performance of these regulatory tools. It was mentioned by officials that no feedback had took place till the moment of conducting this interviews. Hence, measuring the performance of all the above mentioned tools is still unavailable.

- **Economic Tools**

- **Pricing Structure for electricity service use**

According to law number 12/1976, an electricity meter should be installed in every household connected to electricity service. The tariff applied for the residential sector is heavily subsidized, and structured into **six different pricing segments**. The service is subsidized from the first till the fourth pricing segment, while the fifth and the six segments are not subsidized. Here it is worth to mention that the tariff and the pricing structure for electricity use are reviewed and raised annually by 5 to 7.5%. Table 4.2 provides an overview of the tariff structure for residential sector, as per 2010.

Table 4. 2: Energy tariff structure for the residential sector ⁵

Pricing Segment for Electricity use (kwh/ month)	Price (EGP/ kwh)	Percentage of Cairo city consumers within each segment
First 50 kwh	0.05	17.8%
51 – 200 kwh	0.11	49.14%
201- 350 kwh	0.16	23.36%
351 – 650 kwh	0.24	7.47%
651- 1000 kwh	0.39	1.41%
More than 1000 kwh	0.48	0.73%

Source: Egyptian Electricity Holding Company annual report, 2010

From the above table, the pricing segments discourage the excessive use of electricity within households, since the tariff is progressive. Accordingly, almost 75% of Cairo households lay between the second and the third segment. However, it is still heavily subsidized as per stated by officials.

- **Service use tax**

Currently, no energy service tax is applied in Egypt for the residential sector. This case is however applied in the industrial sector, especially for the heavy energy consuming industries.

B. Soft Measures

This part reflects upon the findings from both; secondary sources and in depth interviews with officials from the media and awareness department of the energy utility consumer regulatory agency (Egypt-ERA), and the director and deputy director of EEIGGR project.

- **Media Campaigns**

The mandate of Egypt ERA is improving the quality of energy service provision. According to officials from the media and awareness department, this goal will be reached through development of the awareness strategic plan for energy conservation within the residential sector. The agency has developed an ambitious strategic awareness plan with the aim of energy conservation within the residential sector. This plan includes a number of **media campaigns**, and an **energy conservation booklet**. Egypt ERA also developed their own internet website. One of the services offered on the website is an **opinion poll** for measuring satisfaction of consumers with electricity service provision.

⁵ Currency convertor, 1.00 USD = 5.95250 EGP, September 2011

The results of the poll trigger the agency to improve upon service delivery. The website includes as well useful data for energy saving practices.

Subsequently, the electricity holding company started in 2010 to distribute **9 awareness leaflets** with the monthly electricity bill, showing the benefits of using energy efficient appliances in households. These leaflets provide information on the importance of using energy efficient appliances, and energy efficient bulbs and consumption rates of home appliances. The energy efficiency and greenhouse gas project funded the publication of these leaflets, since this effort supports in achieving the project main goal which is cutting down 4.2 MTOE⁶ annually of energy generated in Egypt, starting from 2010. Still, important notice to be mentioned here is that so far no feedback was done to measure the performance of such activities, similar to the above mentioned regulatory tools.

Figure 4. 12: Some of the conservation materials used by government.



Source: Media and Awareness department, 2010

• Educational Tools for Sustainability

Currently, there are no activities conducted in the field of energy saving campaigns or educational tools developed. The department of media and awareness in Egypt ERA stated that they are however working on the development of a protocol for cooperation with the minister of education for designing educational materials, booklets, and stories in relation to energy saving practices.

⁶ MTOE = Million Tonnes of Oil Equivalent

Table 4. 3: Summary of government used instruments in electricity sector

Governmental Bodies	Hard Measures		Soft Measures	
	Regulatory Tools	Economic Tools	Media Campaigns	Education for sustainability
- Energy utility consumer regulatory agency (Egypt ERA)	-New law for electricity sector -Ministerial Decree for energy efficiency home appliances	- 6 different tariff structure system	-Energy conservation booklet -Conservation leaflets with the monthly electricity bill -Energy conservation practices on the website	- Preparing new protocol for cooperation with the ministry of education
- Energy efficiency and greenhouse gas (EEIGGR) project	- Adding the use of energy efficient bulbs in the proposed law -Guideline for energy labeling for energy efficiency home appliances -Building Energy Code	NA	NA	NA

Source: Author, 2011

4.8 Civil Societies Instruments for Sustainable Water and Electricity Consumption

As was indicated in chapter 2, CSOs are playing an influential role in promoting sustainable consumption. Therefore, this section highlights the used by CSOs instruments in relation to water and electricity. The instruments used by CSOs are mainly **soft measures** to have an indirect influence on the behaviour of consumers. Finally, the information stated below were driven from the in depth interviews with the civil society organizations officials.

4.8.1 Water Sector

In depth interview was conducted with the head of the **Water Civil Committee** in Cairo city, which is the main community organization dealing with water and wastewater conservation. Here it is important to remark that members in this organization includes; representative from the holding company, politicians, civil society leaders, and some of the actively working NGOs.

- **Media Campaigns**

Water civil committee in Cairo city developed a number of **media campaigns** as well as **workshop activities** targeting housewives for increasing their knowledge on practical water conservation. This was done in a number of districts in Cairo city. The following figure 4.13 provides an impression of these workshops.

Figure 4. 13: Workshop on water conservation practices



Source: Civil Society Committee, 2011

- **Lobbying**

As mentioned before that the water civil society committee includes members from the community itself such as; politicians, actors, and other natural leaders within the community. This committee comprises an important lobby network within the community to promote the need to conserve water within the various society sectors and members.

Table 4. 4: Summary of civil society used instruments in water sector

Civil Society Organizations (CSOs)	Soft Measures	
	Media Campaigns	Lobbying
- Water Civil Committee	-Workshop for housewives on the know how to conserve	-Engaging politicians, actors and other natural leaders in the water civil committee

Source: Author, 2011

4.8.2 Electricity Sector

In depth interviews have been conducted with the **Egyptian consumers and energy organization** (CEO) founder. This organization is considered the first energy consumer movement in Egypt. It was found as one of the main outcomes from the Joint Committee for energy efficiency (JCEE). The CEO was founded in the year 2010, with four main goals in mind to be achieved:

- Protecting and supporting consumers rights, besides raising their awareness on the need for energy saving and conservation.
- Conflict management and consensus building between different parties in the energy sector.
- Provide positive contribution to other sources for energy provision.
- Advocating efficient and effective management to national energy sector.

- **Media Campaigns**

As mentioned above, CEO is considered a newly founded movement to deal with energy conservation among consumers. However, they haven't conducted any awareness campaigns till the moment. They are currently working on preparing their national campaign for awareness building and consumer rights, besides the preparation of database (through surveys and research) on the national residential consumption patterns. This database will be analyzed to serve as a base for the continuous function of monitoring and evaluation of the movement impact in this context. Finally, CEO is currently organizing a national conference on consumer rights and protection (to be used as a public event for the organization launching).

- **Lobbying**

The Egyptian consumers and energy organization (CEO) is an agglomeration of four different non governmental organizations. These four NGOs are working together with other interested parties in the field of energy conservation, having one target which is to raise the awareness among consumers groups. This energy consumer movement is currently working in great harmony and collaboration with the energy consumer protection agency to enable and support consumers groups in protecting their rights and to be an effective party in improving the energy provision sector in Egypt.

Table 4. 5: Summary of civil society used instruments in electricity sector

Civil Society Organizations (CSOs)	Soft Measures	
	Media Campaigns	Lobbying
- Egyptian Consumers and Energy Organization (CEO)	-Preparing the national awareness campaigns and consumer rights	- Lobbying with Egypt ERA and 4 NGOs and private sector to form the energy consumer movement

Source: Author, 2011

4.9 Summary

This chapter has reviewed service agencies in Egypt and Cairo with concern to sustainable water and electricity consumption. As shown, there are a lot of efforts currently undertaken by the national government and the civil society, to arrive at more sustainable water and electricity consumption patterns, although this is not always clearly targeted as such. The currently utilized actions and instruments can be seen as a step forward to reach more sustainable service consumption. The chapter highlights the current strongly centralized system for managing water and electricity service provision in Egypt with clear consequences for Cairo.

It also became clear from the background information in this chapter that, sustainable consumption is not obliged by law. It is depending on voluntary actions by individuals. Government and civil society organizations (CSOs) can still work on increasing the level of coordination between them to develop a framework, which can be used later to bring sustainable service consumption into the national agenda of the country.

Chapter 5 | Research Findings

5.1 Introduction

Chapter five presents the fieldwork findings and analysis. This chapter answers the second and the third sub-research questions. The data illustrated in this chapter are been derived from different sources; including survey with households in the study area and in depth interviews with both the government and CSOs. Quantitative and qualitative data are processed and analyzed, in order to address the research sub-questions.

This chapter is divided into two parts; part one focuses on highlighting the factors affecting consumer behaviour within the study area. The second part presents the best set of policy tools as preferred by the interviewees for promoting sustainable household water and electricity consumption.

5.2 Survey Findings

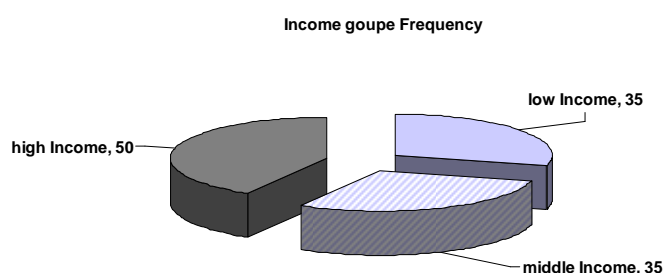
This part discusses the findings from the survey conducted within the study area. The main aim of this survey is to define the factors affecting households' consumption behaviour. Annex 3 of this research presents the used questionnaire. This section is divided into two parts. The first part presents the socio-economic background of the sample size. The second part reflects on the factors affecting consumer behaviour in water and electricity sector.

5.2.1 Socio-economic Background

As mentioned in chapter 3, Al-Manial district was selected as the study area for conducting the survey. The sample surveyed was composed of a total of 120 respondents. These respondents were selected to possess the following characteristics:

Income Groups: Three different income groups are presented within the surveyed sample. The total percentage of the high income group is 40%; with annual income more than 6000\$. The percentage of middle income group is 30%; with annual income (1000\$- 6000\$). The low income group represents 30% of the sample; with annual income less than 1000\$. Figure 5.2 shows the frequencies for the three income groups⁷.

Figure 5. 1: Income groups frequencies within the sample



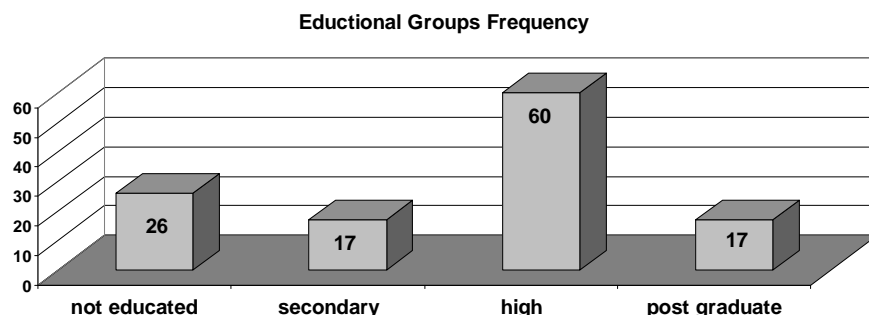
Source: Study Area Survey Findings, 2011

Educational Groups: Four different educational groups are presented within the surveyed sample. The percentage of the first group (not educated) is 21.6%, while the percentage of the second group (secondary education) is 14.3%. The third group (high education) counts 50%

⁷ Income groups were differentiated based on the ministry of finance report on income groups (2010).

of the sample, and finally the total percentage of the last group (post graduate) represents 14%. Figure 5.3 shows the frequencies for the different educational groups.

Figure 5. 2: Educational background groups frequencies within the sample



Source: Study Area Survey Findings, 2011

However, the three income groups of respondents are found to have more or less homogenous educational backgrounds. Table 5.1 elaborates upon this:

- In the high income group, a majority has high to post graduate educational background;
- In the middle income group, a majority has secondary to high level of education; and
- In the low income group, a majority of respondents is uneducated and only 1/4 has a secondary educational background.

Table 5. 1: Educational Background of the three income groups

Income Group	Education							
	Uneducated		Secondary		High Education		Post Graduate	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
High	0	0%	2	4%	34	68%	14	28%
Middle	0	0%	6	16%	26	75%	3	9%
Low	26	75%	9	25%	0	0%	0	0%

Source: Study Area Survey Findings, 2011

- Religious Believe

Based on the religious nature of the Egyptians, a general question was asked about the respondents' motive to follow conservation and saving practices. **The religious factor** was found to be the first reason of choice by 100% of all the respondents in both water and electricity sectors. According to them, the religious faith they follow is the most determinant factor for the pursue of practices to rationalize, as religion had ordered them, taking on board conservation within their lifestyle.

- Link of Religious Belief to Water Sector

According to respondents, the religious faith is the most important reason to pursue practices to rationalize, as religion had ordered them to do conserve in general, and particularly in the water sector.

"...During the last Friday prayer gathering, the Imam was talking about the need to use water in an efficient way..... After that, I started to encourage my family to change our consumption behaviour... "

(Personal Communications with respondents from middle income group, Egypt, July 2011).

"...I am living near a priest, he discussed with me that a true Christian should not use water in excessive way Now, I had already reduced my level of water consumption and encouraged my family to change our consumption behaviour..."

(Personal Communications with respondents from low income group, Egypt, July 2011).

- Link of Religious Belief to Electricity Sector

Respondents are making a relation between the amount of money paid for the monthly electricity bill and the fact that their religion is teaching them that one should live in an economical way. According to many respondents, there is a clear link between the religion and the fact that one should live economically, which implies doesn't waste electricity. For them religion and reduction of expenditure for living are closely related to each other.

"...Following conservation practices are important according to our religious principles. This has a direct impact to reduce our expenditure which is part of our religious. God says in the holy Koran;

..." And those, who, when they spend, are neither extravagant nor niggardly, but hold a medium (way) between those (extremes). (Surah Al-Furqan (The Criterion)/67)"... "

(Personal Communications with respondents from low income group, Egypt, July 2011).

Accordingly, the religious factor turns out to have an important influence on consumer behaviour. There is a great link between the need to follow conservation practices and the religious belief of the respondents. Based on this finding, religion can be considered an important tool to be used in awareness campaigns.

Based on the above mentioned sample characteristics; *the level of income, the level of education and the religious belief* are used as crosscutting factors to measure its relation with each of the illustrated factors in the coming section (section 5.2.2).

5.2.2 Factors Affecting Households Consumption Behaviour

As mentioned before in the literature review, households' consumption behaviour is being affected by many factors. These factors were measured through the survey within the study area.

Hereby, each factor is presented according to its relation with the three different crosscutting factors mentioned in the above section (section 5.2.1). SPSS statistical test techniques are used to measure this relation. Finally, each factor is revealed in relation with water and electricity consumption behaviour.

A. Level of Awareness

The level of awareness within the survey was measured using four different types of questions. This is to ensure the reliability of respondents' answers. The questions which were asked are related to:

- Respondents' believe that their level of consumption is affecting the environment;
- The awareness of the existence of institutional bodies related to services conservation;
- The awareness of the existence of conservation campaigns; and.
- Households' knowledge on the know how to conserve.

From the survey, answers of the above asked questions are grouped together to form different categories of awareness. Later, correlation test and other statistical techniques are done using SPSS software to measure the relation between these categories and the crosscutting factors; income, education and religion. This helps on having a better envision on the relation of awareness with these factors.

- Water Sector

Generally, only 45% of the respondents' **agreed that their level of water consumption is affecting the environment**; while the remaining 55% had given negative answer or normal answer (neither agree nor disagree). And for measuring the **level of awareness with the existence of water institutional body**, it was found that 88.3% of the respondents do not know about the media and awareness department in the holding company. Similarly, 70% of the respondents have not **heard about any water awareness campaigns**. Finally, more than half of the respondents had stated that they **do not know how to conserve**, with a percentage of 57.5%.

"I remember that I had seen a while ago some water awareness campaigns in the T.V, but since two years I haven't seen any of them either on T.V or anywhere else..."

(Personal Communications with respondents from high income group, Egypt, July 2011).

Table 5. 2: Respondents categories regarding awareness with water use

Water Awareness			
		Frequency	Percent
Valid	0	36	30
	0.25	3	2.5
	1	36	30
	1.25	13	10.8
	2	11	9.2
	2.25	15	12.5
	3	1	0.8
	3.25	5	4.2
Total		120	100

Source: Study Area Survey Findings, 2011

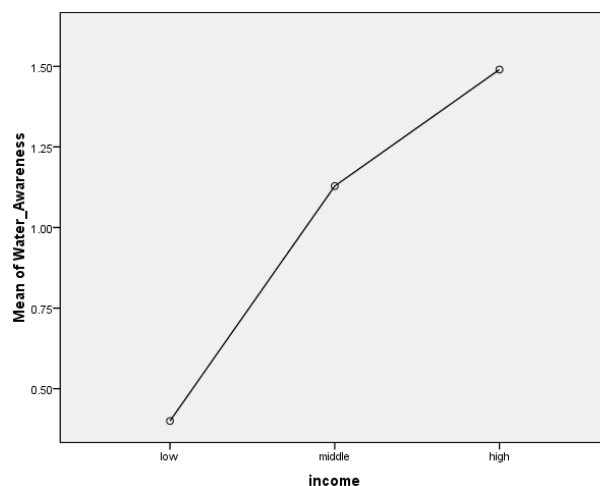
A new variable have been created to measure the level of awareness within the study area. This new variable consists of the answers of the four above mentioned questions. Accordingly, a scale from 0 to 4 is used to measure the level of awareness, where 0 is the lowest level of awareness and 4 is the highest level of awareness. Table 5.2 shows the score and answers for the categories of respondents. In this table, the highest score by the investigated group was 3.25, as people didn't score higher than that. In this regards, almost 60% of the sample had scored below or equal to 1, which shows that the level of awareness within the study area with regards to water is relatively low.

Moreover, a significant difference was found between groups of level of income and the level of awareness. Low income group are less aware with the consequence of water consumption on environment compared to middle and high income groups, respectively 0.4 versus 1.12 and 1.49 (**F= 18.712, df=2, p<0.05**). However, high income group is found to be the most aware group, although their awareness level still relatively low, as their mean score does not exceed 1.49.

Similarly, there is significant difference found between different level of education and the level of awareness. The uneducated group are less aware with the consequence of water consumption on environment compared to secondary, high and post graduate educational backgrounds, respectively 0.4 versus 1.13, 1.32 and 1.10 ($F= 6.963, df=2, p<0.05$). Respondents with high educational background are found to be the most aware group. This shows that the high the level of education, the more the level of awareness. Also the personal attitude of highly educated groups is different than groups with lower level of education, as the highly educated groups has a proper access to different sources of information which shapes their attitude and awareness level more than lower educational groups.

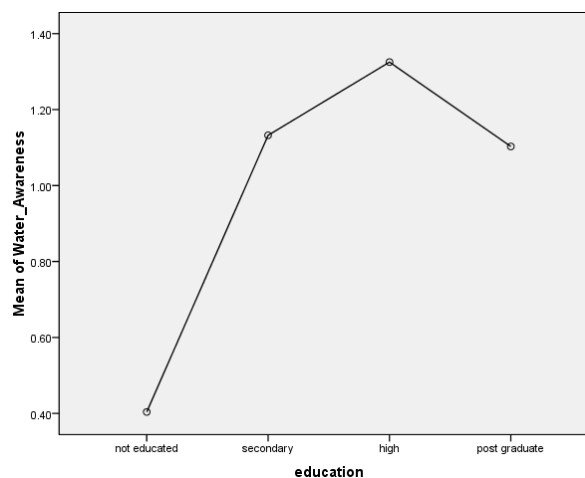
On the other hand, **no difference** was found between different religious belief groups and the level of awareness. In this regards, people with least religious belief are found to be less aware with the consequence of water consumption on environment compared to other groups, respectively 0.835 versus 1.18 and 1.22 ($F= 1.989, df=2, p>0.05$). It was found that people with moderate religious belief are found to be the most aware group. This is considered unexpected as the highly religious group of respondents was the only group able to link their behaviour with religious belief. However, it can still be considered as an opportunity to use the religious factor in awareness campaigns.

Figure 5. 3: Relation between level of income and level of water awareness



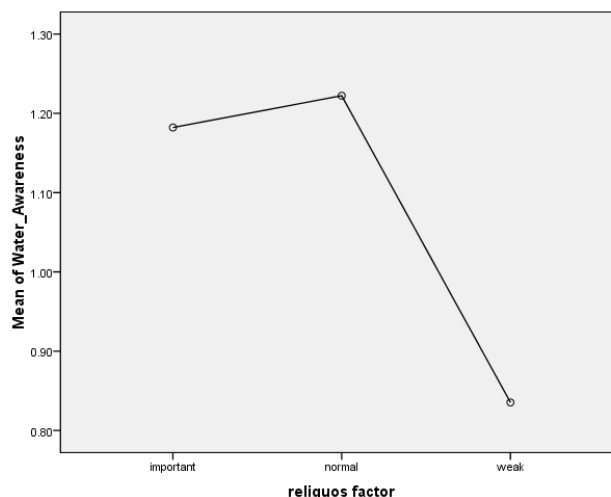
Source: Study Area Survey Findings, 2011

Figure 5. 4: Relation between level of education and level of water awareness



Source: Study Area Survey Findings, 2011

Figure 5. 5: Relation between religious belief and level of water awareness



Source: Study Area Survey Findings, 2011

- Electricity Sector

In general, respondents were found less to agree that their level of consumption is affecting the environment. They believe that their consumption rate is less than other sectors such as the industrial sector for example to impact the environment. In addition, 35% of the respondents' had **disagreed that their level of electricity consumption is affecting the environment**, while the percentage of people who gave normal answer (neither agree nor disagree), and people whom were found to agree that their consumption affects environment are found to be the same, with 32.5% and 32.5% respectively.

"....I do believe that my electricity consumption affects the environment, because it is known that electricity needs fuel to be produced. However, I don't believe that the residential consumption rate is high compared with other sectors such as the industrial sector which pollutes the environment more than we do ..."

(Personal Communications with respondents from middle income group, Egypt, July 2011).

In terms of measuring the **level of awareness with the electricity institutional body**, it was found that 85% of the respondents do not know about Egypt ERA. On the other hand, 65% of the respondents have not **heard about any electricity awareness campaigns**. The question on **the knowledge of the households on the know how to conserve** was asked to respondents with regards to the electricity conservation practices. The response on this question is different than the water sector. Almost 65% of households had stated that they know how to conserve, but they don't find any kind of campaigns to encourage such behaviour.

Table 5. 3: Respondents categories regarding awareness with electricity use

Electricity Awareness			
		Frequency	Percent
Valid	0	48	40
	0.25	30	25
	1	17	14.2
	1.25	16	13.3
	2	4	3.3
	2.25	5	4.2
Total		120	100

Source: Study Area Survey Findings, 2011

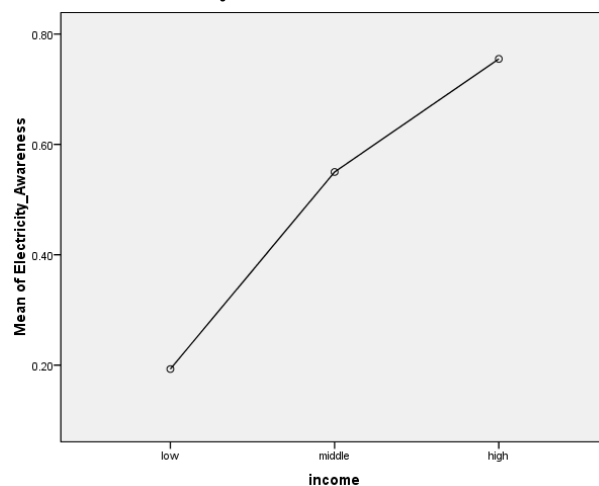
Similar to water, new variable was created based on the answers of the four awareness asked questions. Similarly, a scale from 0 to 4 is used to measure the level of awareness, where 0 is the lowest level of awareness and 4 is the highest level of awareness. Table 5.3 shows the score for the categories of respondents. In this table, the highest group of respondents had scored only 2.25, which is considered moderate level of awareness, as no one had scored the high score which is 4. The table shows also that 80% of the group had scored below or equal to 1. This also shows that the overall level of awareness with regards to electricity is relatively low.

With respect to the level of income, a significant difference between different income groups was found with their level of awareness. Similar to water sector, low income group are less aware with the consequence of electricity consumption on environment compared to middle and high income groups, respectively 0.19 versus 0.55 and 0.75 (**F= 8.519, df=2, p<0.05**). In this regards, the three different income groups had scored below 1, which is low score. This shows that generally the three different income groups are not aware with this topic.

Likewise, a difference between groups of level of education and the level of awareness is found. Uneducated group of respondents are less aware with the consequence of electricity consumption on environment compared to secondary, high and post graduate educational backgrounds, respectively 0.16 versus 0.41, 0.66 and 0.73 (**F= 4.705, df=3, p<0.05**). Consequently, all the educational groups are found to score less than 1, which shows that the level of awareness is quite low.

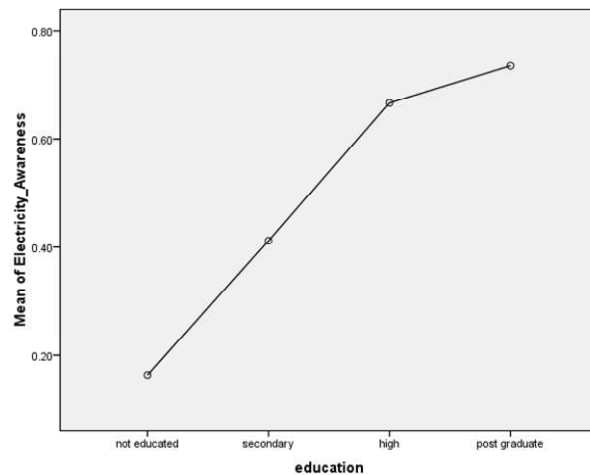
On the other hand, a significant relationship was found between the religious belief and the level of awareness. In this regards, people with least religious belief are found to be less aware with the water use followed by the most religious group, while people with moderate religious belief are found to be the most aware group, respectively 0.37 versus 0.55 and 1.027 (**F= 3.927, df=2, p<0.05**). The mean score for the less religious group of respondents and the most religious group is found to have close means, which shows their less awareness level.

Figure 5. 6: Relation between level of income and level of electricity awareness



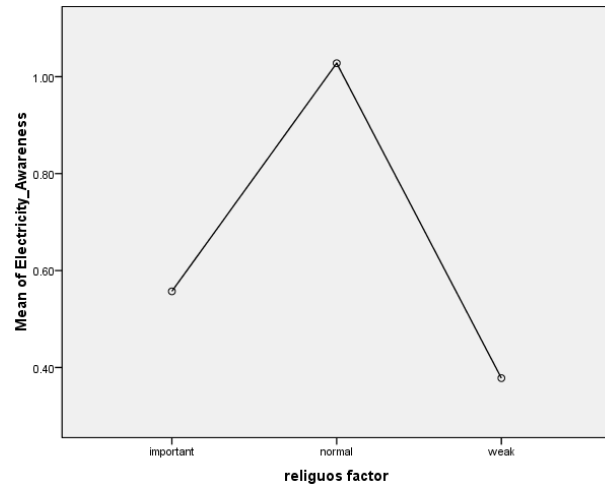
Source: Study Area Survey Findings, 2011

Figure 5. 7: Relation between level of education and level of electricity awareness



Source: Study Area Survey Findings, 2011

Figure 5. 8: Relation between religious belief and level of electricity awareness



Source: Study Area Survey Findings, 2011

To sum-up, a positive feedback was observed in general with regards to the personal attitude with the level of awareness from households. However, the awareness level within the study area is still fairly moderate. The level of awareness with respect to water sector is found to be higher than electricity sector. Another remark can be highlighted that the high and the middle income group were found to be the most aware groups in relation to both water and electricity services. In other word, it was witnessed that the high the level of income, the high the level of awareness. Similarly, the consequences of the educational background was highly observed, where the high the level of education, the high the level of awareness. While for the religious belief, it was found that the group of respondents with average and moderate religious belief are aware more than the highly religious group of respondents.

Another important remark is experienced, that respondents are not aware with the existence of both; the service use institutions and campaigns as well. This shows that the current actions undertaken by the actors are highly needed to be reviewed. Finally, a knowledge gap was found within all groups on the know how to conserve in water service, while this was not the case with the electricity service.

B. Level of Responsibility

Level of responsibility is considered an important factor to affect households' behaviour towards service use. According to the survey, the level of responsibility was measured using two types of questions, to determine the overall level of responsibility within the study area. The questions which were asked are related to:

- Taking the environmental impacts of consumption in consideration; and
- The keenness of households to join conservation practices.

Similar to the level of awareness, answers of the above asked questions are grouped together to form different categories of responsibility. These categories were compared with the same crosscutting factors; income, education and religion. Also correlation tests and other statistical techniques are done using SPSS software to measure the relation with the crosscutting factors.

- Water Sector

From the survey, 40% of the respondents' stated that they are **not considering the environment within their daily consumption**, in general. On the other hand, 38% of the respondents' indicated that they are considering the environment within their consumption. These results give clear indication that both groups are similar in percentage. However, if the percentage of respondents stated that they are normally considering the environment, which counts 24%, is added to respondents with positive feedback, this count in total 62%. This shows that the overall feeling of responsibility within the study area is high. Respondents were also asked whether they are **interested in following water conservation practices**. 70% of households are found to be interested to join water conservation practices, in case of conducting any water conservation awareness or workshops.

Table 5. 4: Respondents categories regarding responsibility with water use

Water responsibility			
Valid		Frequency	Percent
	0	32	26.7
0.5	43	35.8	
1	3	2.5	
1.5	42	35	
Total	120	100	

Source: Study Area Survey Findings, 2011

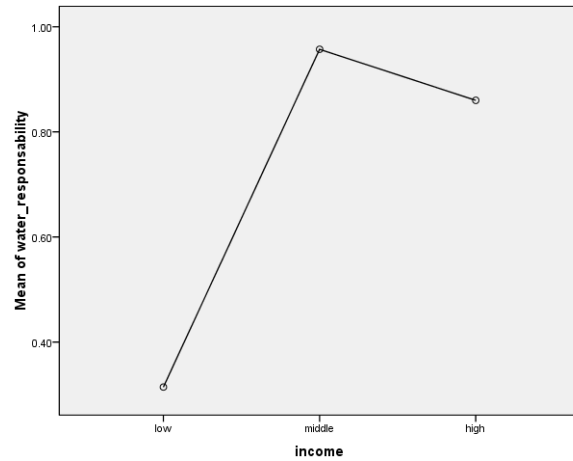
Using SPSS techniques, a new variable have been created to measure the level of responsibility within the study area. This new variable consists of the answers of the two above mentioned questions. A scale from 0 to 2 was used to measure the level of responsibility, where 0 is the lowest level of responsibility, and 2 is the highest. Table 5.4 provides details on this. Accordingly, the level of responsibility within the study area is found to be relatively high, as almost 35% of the respondents had scored 1.5, although 62% of the whole group had scored 0.5 or less.

A highly significance was found between different group of income and the level of responsibility. Middle income group are found to be the most responsible group with their water consumption compared to high and low income groups, respectively 0.95 versus 0.86 and 0.31 (**F= 14.23, df=2, p<0.05**). Yet, the difference between middle and high income groups is found to be close to each other within their means.

Likewise, a difference was found between different groups of educational level and the level of responsibility. Uneducated respondents are considered the less responsible group when dealing with water consumption compared to secondary, high and post graduate educational backgrounds, respectively 0.28 versus 0.67, 0.88 and 0.91 ($F= 7.338, df=2, p<0.05$). This shows that the uneducated groups are less to feel responsible with regards to water service use, as they were not been informed about the importance of water service in order to raise their responsibility level.

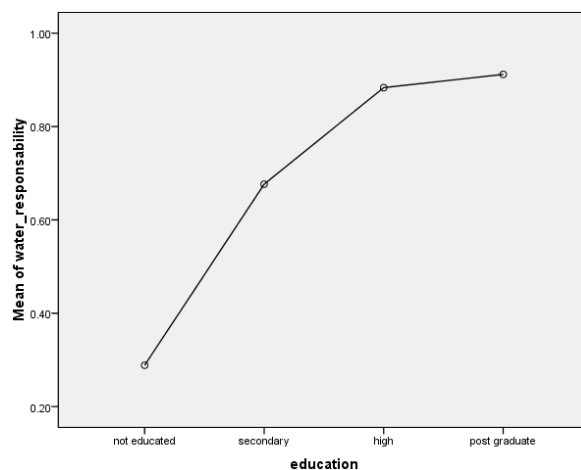
Finally, and with respect to the religious belief, strong relation between the religious belief and the level of responsibility was examined. People with least religious belief are found to be less responsible when dealing with water consumption compared to other groups, respectively 0.18 versus 0.94 and 1.16 ($F= 32.86, df=2, p<0.05$). Similar to the level of awareness, it was found that people with moderate religious belief are found to be the most responsible group, even though there are similarities in means between the highly religious group and the moderate religious group.

Figure 5. 9: Relation between level of income and level of responsibility with water use



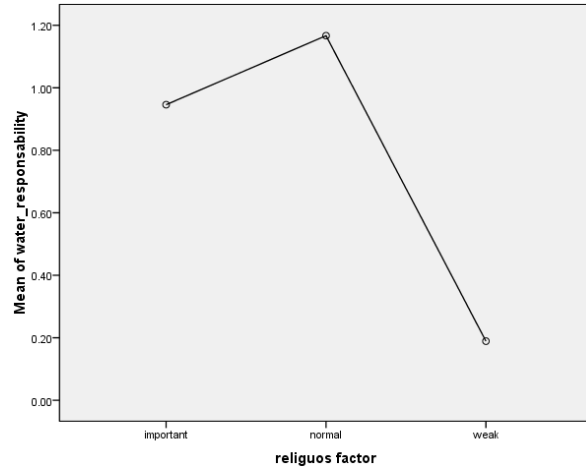
Source: Study Area Survey Findings, 2011

Figure 5. 10: Relation between level of education and level of responsibility with water use



Source: Study Area Survey Findings, 2011

Figure 5. 11: Relation between religious belief and level of responsibility with water use



Source: Study Area Survey Findings, 2011

- Electricity Sector

According to survey results, 45% of households are **considering the environment within their daily consumption**. However, 25% of households are found to be not considering the environment within their consumption. Nonetheless, the results from this part shows that the overall feeling of responsibility within the study area is quite high, after adding the percentage of households stating that they normally (neither agree nor disagree) consider the environment, we can find that 75% of the whole sample gives a positive response towards the environment. Additionally, respondents were asked whether if they are **interested to join electricity conservation practices**. Similar results are found with results from water sector. 75% of households are interested to join electricity conservation practices, in case of conducting any electricity conservation campaigns or workshops.

Table 5. 5: Respondents categories regarding responsibility with electricity use

Electricity responsibility			
		Frequency	Percent
Valid	0	31	25.8
	0.5	44	36.8
	1	2	1.6
	1.5	43	35.8
Total		120	100

Source: Study Area Survey Findings, 2011

From the above asked questions, new variable have been created similar to water to measure the level of responsibility within the study area. Similar to water sector, a scale from 0 to 2 was used to measure the level of responsibility, where 0 is the lowest level of responsibility, and 2 is the highest. Table 5.4 provides details on this. Table 5.5 shows the score for the categories of respondents. Almost 35% of respondents scored 1.5 which is considered the highest score within the investigated group.

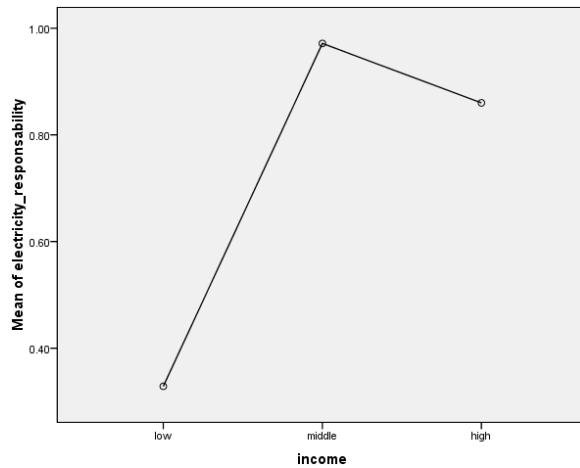
In this regards, groups with different level of income are found to have different responsibility level. In other word, there is a strong relation between the level of income and the level of responsibility. Similar to water sector, the middle income group are found to be the most responsible group with their electricity consumption compared to high and low income groups, respectively 0.98 versus 0.87 and 0.33 (**F= 13.85, df=2, p<0.05**).

In addition, similar to income level, a strong relationship was found between the level of education and the level of responsibility. Uneducated respondents are considered the less responsible group when dealing with electricity consumption compared to secondary, high

and post graduate educational backgrounds, respectively 0.28 versus 0.70, 0.89 and 0.91 ($F=7.47$, $df=2$, $p<0.05$). However, this shows the influence of education in shaping the responsibility level within the study area, as the high the level of education, the more the responsibility.

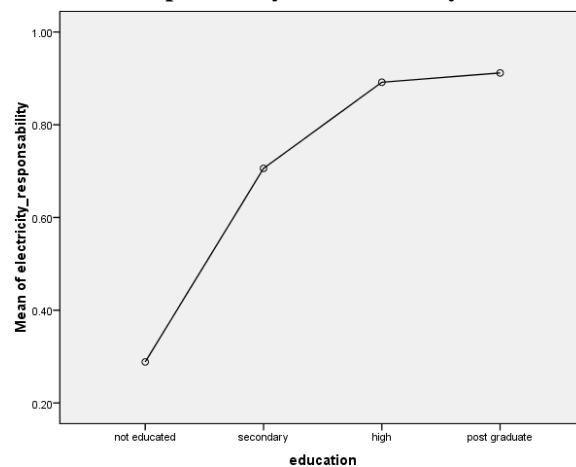
With respect to the religious belief, strong relation between the religious belief and the level of responsibility was examined. People with moderate religious belief are found to be the most responsible group when dealing with electricity consumption compared to other groups, respectively 1.16 versus 0.91 and 0.2 ($F=31.8$, $df=2$, $p<0.05$).

Figure 5. 12: Relation between level of income and level of responsibility with electricity use



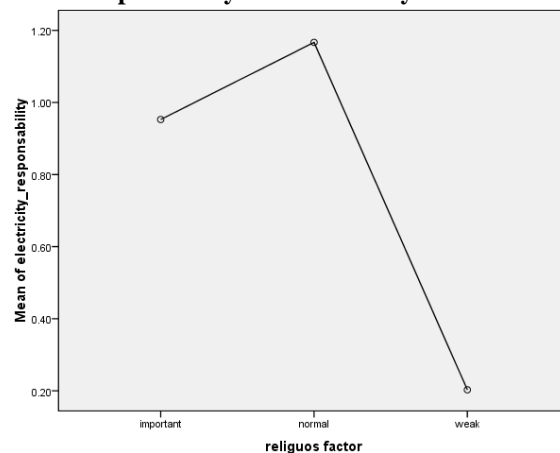
Source: Study Area Survey Findings, 2011

Figure 5. 13: Relation between level of education and level of responsibility with electricity use



Source: Study Area Survey Findings, 2011

Figure 5. 14: Relation between religious belief and level of responsibility with electricity use



Source: Study Area Survey Findings, 2011

To conclude, the level of responsibility is found to be promising for both water and electricity services. The mean score of the level of responsibility is found to be closer to the highest score (1.5 out of 2), more than the level of awareness (highest score was 3 out of 4). In this regards, we can say that people feel responsible when dealing with services while they are not aware how to conserve and practice. However, similar conclusion can be drawn to the level of awareness, that low income group and uneducated group of respondents are still the least group to feel responsible to the environment. Another important conclusion can be presented, that the level of responsibility was found to be higher within the middle income group than the high income group.

C. Conservation Practice

As per mentioned in the literature review in chapter two, the actual conservation practice is one of the factors which shapes consumers' behaviour. Throughout the survey, households were asked whether they are practicing any kind of conservation activities with regards to water and electricity.

Answers of the conservation practice activities are being compared with the crosscutting factors; level of income, level of education and religious belief. This was done through using SPSS statistical test.

- Water Sector

Generally, it was found that 60% of the total sample is **not following any kind of conservation practices**. Then, 40% of the respondents are following conservation practices. Such practices as been stated by households are mainly the daily behaviour activities such as using water in an efficient way and maintaining their water connections in case of any leakage. In this regards, it was not mentioned by households that they are not using any kind of water save equipments.

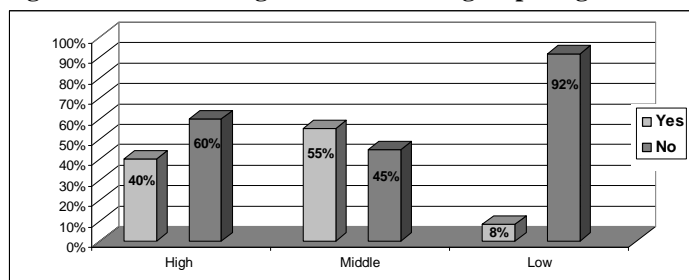
In addition, a strong relation was found between **following water conservation practice and different income groups (Chi-square= 18.859, df= 2, p<0.05)**. Almost 55% of the middle income group are following water conservation behaviour, followed by 40% from the high income. On the other hand, 92% from the low income group are not following any kind of water conservation practices.

However, these results considered unexpected, as 60% from the high income group are not following any water conservation practice or even using any water saving equipments, although they were expected to be the most concerned group based on their own lifestyles. Similarly, results from low income group were found to be unexpected as well. But an important observation was found by the researcher that the majority of the low income group are not paying water fees in regular basis, and some of them are using illegal water connections from the nearest school within their neighbourhood.

"....I don't need to follow any kind of water conservation practices, as I am not paying the water fees. This is because the water provider is not collecting the fees in regular bases. On the other hand, some of the people in the neighborhood are using illegal water connections from the nearest school..."

(Personal Communications with respondents from low income group, Egypt, July 2011).

Figure 5. 15: Percentage of each income group usage of water conservation practices



Source: Study Area Survey Findings, 2011

In addition, no relation was found between **following water conservation practice and different educational groups (Chi-square= 2.406, df= 3, p>0.05)**. Table 5.6 elaborates on this.

Table 5. 6: Following water conservation practice and educational level cross-tabulation

Following any water conservation practice				
Education		yes	no	Total
	not educated	12	14	26
	secondary	7	10	17
	high	19	41	60
	post graduate	8	9	17
Total		46	74	120

Source: Study Area Survey Findings, 2011

Moreover, strong relation was found between **following water conservation practice and the religious belief (Chi-square= 15.214, df= 2, p<0.05)**. Table 5.7 provides details on this. In this regards, almost half of the respondents with strong religious belief stated that they are following water conservation practices, followed by other religious groups of respondents. This shows that religious people are following conservation practices while their level of awareness and responsibility is low because of lack of needed information, although they are following their religious thoughts and beliefs.

Table 5. 7: Following water conservation practice and religious belief cross-tabulation

		following any water conservation practice		
religious factor		yes	no	Total
	important	35	39	74
	normal	6	3	9
	weak	5	32	37
Total		46	74	120

Source: Study Area Survey Findings, 2011

- Electricity Sector

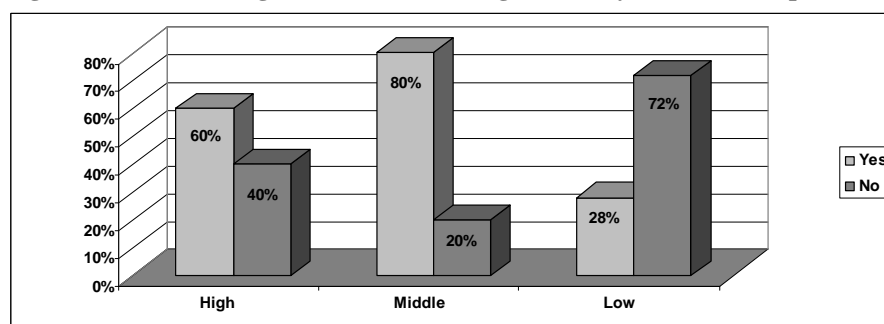
With regards to **conducting electricity conservation practices**, results were different than results of water sector. It was found that 73% are following conservation practices. Then, 27% of the respondents are not following any kind of conservation practices. Within the group of respondents following electricity conservation practices, 55% of the households are using energy efficient bulbs, while the reaming 45% are just following conservation behaviour. Such behaviour is mainly ensuring switching off lights when not needed and the use of electricity when needed only.

An important remark should be highlighted, as households had not stated that they are using energy saving equipments, although they may have it but they don't know that it is energy

saving equipments. This will bring us back to the statement mentioned by officials from Electricity Company that people are not aware of the benefits of the energy saving equipments.

In addition, a strong relation was found between **following electricity conservation practice and different income groups (Chi-square= 18.645, df= 2, p<0.05)**. Similar results are found within both the high and middle income groups. The middle income group was found to be the most concerned group to follow electricity conservation practices with 80%, followed by 60% of the high income group. While, the majority of the low income group are found to be not following electricity conservation practices, with percentage of 72%. However, results are considered expected, as the high and middle income groups are supposed to be concerned to follow conservation practices with the aim to reduce their expenditure on electricity, taking in consideration their lifestyles.

Figure 5. 16: Percentage of households using electricity conservation practices



Source: Study Area Survey Findings, 2011

Furthermore, strong relation was found between **following electricity conservation practice and different educational groups (Chi-square= 17.29, df= 3, p<0.05)**. Table 5.8 shows that the group with high and postgraduate educational background are the highest group of respondents to use electricity conservation practices, followed by the secondary educational background. Finally, the group of respondents with un-educational background were found to be the least group to use electricity conservation practices.

Table 5. 8: Following electricity conservation practice and educational level cross-tabulation

		using any type of energy efficient practices		
		yes	no	Total
Education	not educated	5	21	26
	secondary	12	5	17
	high	36	24	60
	post graduate	12	5	17
Total		65	55	120

Source: Study Area Survey Findings, 2011

Likewise, strong relation was found between **following electricity conservation practice and the religious belief (Chi-square= 12.001, df= 2, p<0.05)**. Table 5.9 gives details on this. In this regards, almost 66% of the respondents with strong religious belief stated that they are following electricity conservation practices, followed by other religious groups of respondents.

Table 5. 9: Following electricity conservation practice and religious belief cross-tabulation

		using any type of energy efficient practices		
		yes	no	Total
religious factor	important	49	25	74
	normal	2	7	9
	weak	14	23	37
Total		65	55	120

Source: Study Area Survey Findings, 2011

To wrap-up, it was found that the percentage of households following conservation practices in the electricity sector is higher than water sector. Strong relation was found between the crosscutting factors and following conservation practices within the respondents. Still, the high and the middle income groups are the most groups following such practices. Finally, respondents with strong religious belief were found to be the highest group to practice conservation activities. This shows how conservative they are in following religious principles and thoughts, although they do not having the same high level of awareness and responsibility.

D. Level of Trust

Level of trust the service provider is one of the important factors to affect households' behaviour towards service use. Accordingly, the level of trust was assessed using two different types of questions, to find out the level of trust to service provider within the study area. The questions which were asked related to:

- Knowing the level of satisfaction with service provision; and
- Believing that government is encouraging sustainable behaviour.

- Water Sector

Generally, it was found that 45% of the respondents are **satisfied with the current water service**, followed by 33.3% with a normal satisfactory result. Here it is worth to say that according to the respondents, the satisfactory factor is measured according to the availability of service and the quality of water.

The indicator to measure satisfaction according to the low income group is the availability of service. According to them, they are satisfied because the water service is available almost all the year. On the opposite, both middle and high income group indicator for satisfaction is the quality of water together with the availability of service. The group of unsatisfied households mentioned that the quality of service is not as expected in some cases as sometimes water may have color and smell as well.

Regarding the level of **believe that government is encouraging sustainable behaviour**, 50% of the respondents mentioned that they trust that the water service provider is encouraging sustainable behaviour, when promoting awareness campaigns. They mentioned that they trust the service provider, based on the importance to preserve water resources. In contrast, the other 50% of the respondents had mentioned that they do not trust the water provider, stating that the government does not have any kind of clear policies or actions and strategies to implement. An important notice should be mentioned here, that the answer for this question may be affected by the current political situation in Egypt. The public is probably biased since the current government is being appointed by people after the Egyptian revolution.

- Electricity Sector

Generally, similar results for satisfaction with the water sector were found. Half of the households mentioned that they are **satisfied with the current electricity service**, followed by 30% with a normal satisfactory result. Similar to water sector, the satisfactory factor is measured according to the availability of service and the quality of electricity.

The indicator of satisfaction within the low income group is the availability of service. Households from middle income group states that the current service is considered satisfied, as the quality of the service is improving year by year. The unsatisfied households mentioned that they are witnessing electricity blackout several times especially in summer season. However, the problem of the electricity blackout is considered a general problem stated by all the respondents within the study area. The main reason for such blackouts as stated by government officials is the excessive use of electricity in summer time beside the hot weather of Cairo.

With regards to the level of **believe that government is encouraging sustainable behaviour**, 52% of the households mentioned that they believe that the electricity service provider is encouraging sustainable behaviour. According to them, the government had worked on distributing energy efficient bulbs, which helps to reduce its prices. This is considered an important indicator to believe that government is encouraging sustainable behaviour. On the other side, 48% of the respondents had mentioned that they do not trust the service provider. These respondents had mentioned that the government is investing in energy efficient bulbs in one side, while on the other side advertisements and street lightings are using incandescent bulbs and it is working day by night. This kind of acts and behaviours is having a negative impact on the attitude of the respondents. According to them, the government does not have any kind of clear policies or actions and strategies to implement.

To conclude, the majority of households are considered satisfied with the current level of service for both water and electricity. On the other side, the middle and the high income groups are found to trust the government actions towards sustainable behaviour more than the low income group. A positive feedback was found from the responses, as a result to the current situation in Egypt. Generally, the level of trust is considered promising within different income groups.

5.3 Policy tools to promote SHWEC in Cairo city

This section illustrates the stakeholders' vision regarding the most suitable policy tools for promoting sustainable household water and electricity consumption (SHWEC). The first part demonstrates the perception of the three groups of stakeholders; government, civil society organizations and the households, on the best policy tools. The second part illustrates the feedback of the policy options within the study area, while the third and the last part reveals the level of integration between stakeholders to reach SHWEC.

5.3.1 Stakeholders Perception on Policy Tools

A. Governmental Bodies

According to the interview conducted with officials from the government side, they had agreed on the need to **revisit the current pricing structure** for both water and electricity service. They stated that the best policy option to be used according to their vision is the **economic tools**, where the current subsidy system should be reconsidered to cover only the low income groups, and the actual price of the service should be charged from the middle and the high income groups.

In this regards, **officials from the water company** had mentioned that they had already started doing statistical analysis to determine what will be the best option to be used for the pricing structure for water service, taking in consideration that the current price for water service is considered relatively low. Likewise, they had stated that they are working currently on improving the collection system of the service charge through changing the current system for charging consumers to add more efficiency to the system.

On the other hand, and **with regards to electricity service**, officials had mentioned that the **economic tools** is considered the best policy option for reaching sustainable consumption, as they had already started reviewing the pricing system for both the industrial sector and the commercial sector as they are the heavily sectors for energy consumption. This is the first step to improve the current pricing system. They stated that the pricing system is being adjusted annually based on their annual statistical analysis. However, they need to reconsider the current subsidy system to add efficiency to the pricing system.

Finally, it is worth to mention that **both the water sector officials and the electricity sector officials** had mentioned that they cannot take any serious step regarding changing the current pricing system due to the current unstable political situation in Egypt because of the revolution. As a result they are giving more attention to **conduct awareness campaigns** with relation to sustainable consumption.

"....According to the Egyptian context, people will not change their consumption behaviour, unless the current pricing system is changed. However, we cannot take any serious action in this regards due to the current political situation of the country... "

(Personal Communications with Official from the holding company for water and wastewater, Egypt, July 2011).

B. Civil Society Organizations (CSOs)

Officials from the civil society organizations from both the water and electricity sector had clearly indicated that they are actively interested to **promote the soft measures** which include conducting awareness campaigns to households' rather than any other policy tools. However, they had mentioned that the **economic tools** should be also used to promote sustainable consumption. In this regards, they had clearly stated that any new pricing system should ensure the accessibility of low income groups to a good quality of service and improve their quality of life.

In regards to the water sector, the head of the water civil committee, said that the use of awareness campaigns is considered an important and effective tool to be used as it can really bring the change to the community consumption behaviour if such campaigns are being used and designed in an efficient and effective manner.

While for the electricity sector, the founder of CEO stated that their main target is to raise the awareness of the consumers and to protect their rights in having a high quality of services. He indicates that they are currently opening a serious discussion with the government and consumers to undertake the best policy option for the awareness campaigns to be designed to reach the target. He mentioned that they are working on building new database for the residential sector consumption behaviour to identify the best policy options to be considered.

C. Households (Consumers)

During the conducted survey, a question was asked to the households to determine the best policy option for promoting sustainable service consumption. 52.5% of the respondents had

selected the **awareness campaigns** to be the best policy tool for promoting sustainable consumption, followed by 18.4% for the economic tools. While 12.5% of the respondents had selected all the policy tools to be used in parallel, stating that it is important to use all the policy options in parallel in order to reach the best results for sustainable service use.

Table 5. 10: Policy options selected by households

Most appropriate policy tools for conservation					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	regulatory tools	20	16.7	16.7	16.7
	economic tools	22	18.4	18.4	35
	awareness campaigns	63	52.5	52.5	87.5
	All together	15	12.5	12.5	100
	Total	120	100	100	

Source: Study Area Survey Findings, 2011

In this regards, Egypt ERA had conducted a poll in the year 2010 to identify the best option for promoting energy conservation practices, more than half of the respondents had mentioned that they should change their behavioural patterns to reach energy conservation rather than changing the current system for pricing structure.

5.3.2 Effectiveness and Acceptance of Tools

During the survey, different kind of questions was asked to the respondents to measure and determine the effectiveness and the acceptance of policy options to be used. A question was asked in regards with the change of the current consumption patterns **in case of changing the pricing system** for water and electricity services. **In regards to water service**, 77.5% of the respondents mentioned that their current level of consumption will be the same if the current pricing system is increased. However, the question did not mention a limit for this rise. The respondents states that their water consumption behaviour will not be changed, as in all cases the pricing system for the service is considered affordable and will not be raised according to the fact that the water company is subsidizing the service with a good considerable percentage. Yet, it was noticed from the respondents that the water company is not collecting the charge for the service in an efficient way. This gives an important indicator that in case of improving the collection system for water service; the answer of the respondents may change and differ.

On the other-side, 45% of the respondents had stated that their level of **electricity consumption** will decrease in case of raising the pricing system of the service, followed by 55% of them had mentioned that their level of consumption will be the same. In this regards, the percentage of both answers is found to be similar to each other. The respondents had mentioned that they can easily change their electricity consumption behaviour through following more conservation activities, such as; using efficient electricity bulbs and energy saving equipments and changing their behaviour.

However, 67% of the respondents had indicated that it is important for both the government and the civil society organizations to work together to find the best policy options to be used to promote sustainable service use. They mentioned that both the government and the civil society organizations have the capacities to reach an effective policy tool.

5.3.3 Interaction of Stakeholders

As mentioned above, the interview conducted with the government had included officials from the Egyptian environmental affairs agency (EEAA) and the consumer protection

agency, as they are considered of great relevance to the topic of sustainable consumption. It was found that the topic of sustainable service use is not on the agenda of both bodies. However, the official from the consumer protection agency states that the need to promote sustainable service and product use is part of the law, but they are currently focusing in protecting consumers' rights to have a good quality of products and goods. While for the EEAA, official mentioned that there is no any level of integration with the service providers to help in promoting sustainable service use.

With regards to the level of **interaction with the civil society organizations**, it was mentioned above that the **water civil committee** includes in its board of members, a representative from the water service provider to help in adding efficiency to the efforts done by the committee. This also works in parallel with the action plan of the media and awareness department to increase the level of interaction between the holding company and the civil society.

Regarding the electricity sector, it was mentioned above that a high level of coordination is currently taking place between the CEO and the service provider to decide what will be the best policy option to be used to promote energy conservation and to ensure consumers' right for having a better quality of service.

Finally, it was mentioned in chapter 4 that all the undertaken actions are not felt by the households, where the majority of them had stated that they did not heard about the activities done in the field of conservation activities. This gives a clear understanding that the current awareness strategy is not considered efficient as it is not interacting with the end users (consumers).

5.4 Conclusion

This chapter gives a clear understanding on the factors affecting households' service behaviour. This include, level of awareness, level of responsibility, following conservation practice and level of trust. However, it was observed from the survey that the level of responsibility in the study area is higher than the level of awareness. Also, low income group and the group of respondents with less educational background are the least aware and responsible group. This shows the need to design awareness campaigns to target these groups in particular. With respect to the religious belief, it was found that respondents with strong religious belief are the highest group to practice conservation activities with regards to water and electricity. However, they are not highly aware or responsible. Generally, the attitude of households is considered very promising for receiving awareness campaigns due the current situation in Egypt. In this regards, stakeholders can use this attitude for the campaigns.

Moreover, awareness campaigns are found to be the most suitable policy tools to be used due to the current situation. However, the results from the conducted survey can be used positively in designing the best awareness campaigns. Finally, the level of integration between stakeholders is quite normal. In terms of the intergovernmental coordination, there is no any kind of clear strategy for such interaction. While for the interaction with the civil society, the current coordination system is considered promising and is subjected for more efficiency in the future in case of putting sustainable service consumption on the political agenda of the country and Cairo as well.

Chapter 6 | Conclusions and Recommendations

6.1 Introduction

Chapter six provides an outline of the research findings, for both the research question, as well as literature review. **This research aimed to** investigate policy and strategic options for reaching sustainable water and electricity consumption patterns in the city of Cairo.

The chapter is divided into three different sections. The first section reflects on the answer of the sub research questions. Section two links the findings of the research question with the literature review in chapter two of this thesis. Finally, the third section gives a number of recommendations in relation to sustainable service consumption. The chapter wraps up with a conclusion for the whole research.

6.2 Reflection on Research Question

In response to the main research question; *'How to promote Sustainable Households Water and Electricity Consumption in the City of Cairo?'*. This section gives the answers reached for the three sub-research questions, as follows:

A. 'what are the current actions undertaken in Cairo towards sustainable household water and electricity consumption?'

Section 4.7 and 4.8 in chapter four of this thesis has identified the existence of a number of already standing actions by both; governmental bodies and the civil society organizations in regards to sustainable water and electricity consumption within households. However, all such actions are not held in the name of sustainable consumption. These actions are divided into two parts; **hard and soft measures**.

Hard measures include the issuance of a new law to regulate the services provided for households in terms of water and electricity. The regulatory activities include also the issuance of guidelines for energy labeling for home appliances in the year 2009 to help in improving the energy efficiency for home appliances. Similarly, a pricing structure is currently implemented in the provision of water and electricity services. Still, the current pricing system is considered inefficient according to the officials as it is heavily subsidized which needs to be reviewed. For the soft measures indicated, there are quite a number of actions which are currently being undertaken in the field of conservation and awareness in both the water and electricity sectors. This includes the existence of media awareness campaigns, educational tools for sustainability and the lobbying with the society.

The main problem in this respect is that there was no feedback collected to measure the effectiveness and acceptance for such actions. As a result, only a small number of households are currently aware of these actions while the majority of households do not. This shows that all these actions are not linked with the consumers and households.

In this regard, the existence of a regulatory body for consumer protection in both sectors is considered an important step to help in promoting sustainable service use. This is in addition to the formulation of the water civil committee and the first energy consumer movement which will play an important role in the future in the field of raising the awareness of consumers on the need to consume in a sustainable way. These civil society initiatives will help with the government in creating a sound and strong platform to match the importance of sustainable service use.

B. 'Which factors determine sustainable household water and electricity consumption?'

A survey was carried out within the study area to identify the factors which affects household consumption behaviour. Section 5.2 in chapter five presents the main findings for these factors. Three main crosscutting factors are been used to measure its relation with the behavioural factors .These crosscutting factors are; *level of income, level of responsibility and religious belief*. Consequently, the factors which were generally found to affect consumer behaviour are; the level of awareness, level of responsibility, conservation practice and level of trust in the service provider.

Generally, it was found that the higher the level of income, led to a higher level of awareness. Similarly, it was found that the higher the level of education, the higher the level of responsibility. This is considered an important point to be observed as this information can be used in designing the most effective awareness campaigns. Finally, it was found that people with strong religious belief are the highest group which practice conservation activities with regards water and electricity as well.

For the water sector, it was found that the level of awareness is fairly low within the study area. The level of responsibility was found to be higher than level of awareness, as people does feel responsible but they are not aware on how to conserve. Similarly, the level of religious belief was selected by the respondents as the main motive for conserving water. With respect to conservation practice, only half of the sample is following conservation practices. The conservation practices are not exceeding the daily conservation behaviour with regards to water. Finally, half of the sample is satisfied with the current level of service and trusting that service provider is encouraging conservation behaviour when conducting conservation campaigns.

While for the electricity sector, it was found that the level of awareness is lower than water sector within the study area. The level of responsibility within the study area is found to be high, similar to water sector. It was found that the economic factor in relation to religious belief was selected to be the main motivation for households to conserve, as they had mentioned that the need to reduce the expenditure on the electricity service use is the main aim for energy conservation. Accordingly, it was found that 73% of the sample is following conservation practices, through the use of energy efficient bulbs and daily electricity conservation practices. Yet, half of the respondents are satisfied with the current electricity service and trusting the service provider in case of conducting conservation campaigns.

C. 'What future approach should be taken for promoting SHWEC, as perceived by stakeholders?'

Section 5.3 of chapter five illustrated the answer for this question from both the in depth interviews and the survey carried out within the study area. The main variables for this question were **the hard and soft measures**. Three different indicators are used in response to this question.

The first indicator was the integration of hard and soft measures. Yet, the integration of both measures can be used according to governmental bodies, through revisiting the current pricing system and reschedule the subsidy system. While, currently and as result to the current political situation in Egypt, the use of soft measures is considered the suitable policy options as a first step to be implemented as being stated by government, CSOs and consumers. Government officials states that regulatory tools can be used in-parallel as well with the soft measures through the implementation of the service use guidelines similar to the

one issued in the electricity sector to encourage the use of energy efficiency appliances. The same also can be done in the water sector, through the use of water saving equipments. Later, the economic tools can be used as a second step to promote the sustainable service use. The economic tools include the use of the pricing structure, where it is important according to all stakeholders for the subsidy system to be reviewed and to subsidize only the service for the low income group. A detailed study should be done in the future with regards to finding out what is the best pricing system which can be used will be accepted by consumers.

The second indicator used in this question was the effectiveness and the acceptance of the policy tools. Section 5.3.1 of chapter 5 summarizes the feedback of the study area for measuring the acceptance and the effectiveness of the policy tools. The majority of the respondents had selected the awareness campaigns to be used as an effective policy tool to promote conservation activities. However, they had stated also that their water consumption behaviour will be the same in case of raising the current pricing system of the service and almost half of the respondents had stated that their electricity consumption rate will decrease in case of raising the pricing system.

The final indicator was the interaction between stakeholders. The three different groups of stakeholders here are the government, civil society organizations and the households themselves. Hence the interaction is currently manifested through the integration between the service provider consumer protection agency and the civil society organizations working in this field. The existence of both the water and electricity consumer protection agency is considered very important as this is the main engine for creating such interaction and forming a strong network with the civil society. In this regards, both, the water civil committee and the consumer and energy organizations are doing good efforts in creating this network and in working with the households to help in promoting policy tools.

D. Reflection of the research question on the research objective

To wrap-up, the above three research sub-questions are giving the answer for the main research question stated above and addressing the research objective as well. The answer is hence divided **into three different parts**; the **first part** highlighted the current situation with regards to sustainable service use policies in Cairo, and documenting the undertaken actions by stakeholders. This has helped in measuring the feedback for these actions and instruments within the community. Consequently, **the second part** covers the survey which was carried out within the study area, identifying the factors which affect consumer behaviour within Cairo city. Afterwards, measuring the relation of the factors which affects the behaviour with the level of income, education and religious belief had helped in having a clear overview on the condition within the local context of Cairo. **Finally the last part**, helped in identifying the best and the appropriate policy tools to be used in future to promote sustainable service consumption, as been perceived by stakeholders. **As result**, the three sub-questions were designed to cover the three aspects of the research objective; investigating current actions, identifying behavioural factors and exploring the future vision to reach sustainable consumption patterns in the City of Cairo.

6.3 Reflection on Literature

This section reflects on the literature review and compares the findings of this research with the existing knowledge on sustainable service use, according to the local context of Cairo and illustrates whether it is significant to the Egyptian situation or not.

A. Factors Affecting Consumer Behaviour

The analysis of the local context of the City of Cairo within the study area shows that the situation in Cairo is similar to what has been revealed through the literature review. In this respect, factors which affect consumer behaviour within the City of Cairo were found to be identical. The personal attitudes within households were found to be controlled by the same three conditions which have been studied earlier. These three conditions were the level of awareness, the level of trust and the level of responsibility. These conditions had shaped the households' attitudes towards the concept of sustainable service use, where the majority of households were aware of the importance of following conservation practices. However, they are lacking the knowledge on the know how to conserve. Moreover, important relation was found between the level of income and education with the above mentioned factors. Both income and educational background had impacted strongly on shaping the personal attitude for the households.

In this regards, the argument which was done by Holden (2004), was proved through the survey carried out in the study area, as there is directly proportional relation between income and environmental awareness, when income increases, the interest in the environment increases as well. Similarly, the remark which was done by Riddel (2003) was found to be identical to the case in the City of Cairo, as groups with higher level of education are more able to link their behaviour to the environment more than groups with lower educational backgrounds.

Yet, the Egyptian context is considered somewhat different from any other context in terms of the culture aspects which affect their consumption behaviour. This was clearly witnessed where the majority of the households within the study area, had selected the religious belief and faith to be the main motive for following such conservation practices. Egyptians are considered religious people and they are giving the religious facet of their life great weight in terms of influencing their lifestyles and actions. This can be easily noticed from their keenness to attend the weekly gathering on Friday for Muslims and the Sunday gathering for Christians. This was also examined from the conducted survey, where the majority of households following conservation practices are found to be from the highly religious group of respondents. This notice can be used to support the design of the awareness campaigns to promote the sustainable service use in the most effective manner.

B. Role of Government

The role of the government (GoE) in the local context of Cairo was found to be different from the role of the government studied in literature. According to the context of Cairo, the local government has no power over promoting the issue of sustainable service consumption, as Egypt is a highly centralized country and the service provider is the main engine for promoting such policies. This shows that both the water and electricity consumer protection agencies are the main legal bodies to work with the civil society in designing the best set of options to be used to promote such policies. Hence, the in depth interviews were focused on reviewing their vision of how to promote this concept in Cairo.

C. Role of Civil Society Organizations (CSOs)

Civil Society Organizations were found to operate slightly differently from the literature studied. It is true that they operate in the field of empowerment. However, they still face problems on how to manage, work in harmony and integrate with the service providers to reach the best options which suit the local context of the city. Also they were found to lack the means which can aid them in effectively penetrating and reaching all the strata of the

community. During the interviews conducted with the representatives from the CSOs, it was stated that they need to work in building their own capacities and to be more effective in order for them to form a powerful pressure groups and place more pressure on the government to help in presenting a series of discussions to find the best options for reaching SHWEC.

6.4 Conclusions

This research is considered an important document for officials to conduct more in depth studies on the field of sustainable service consumption. The topic of sustainable service use is pivotal in sustainable city planning and/or management. Therefore, it would be considered vital to allocate more time for professionals and experts to work on finding alternatives sustainable solutions which can help in improving the quality of life of the consumers as well as finding other alternatives for water and energy resources.

To wrap-up, the research is adding to the existing literature on sustainable consumption and factors affecting consumer behaviour. The research discusses the different elements to develop the most suitable framework for sustainable service use within a community. It tackles the challenges and opportunities to promote sustainable water and electricity use within the urban City of Cairo in order to give references for conducting future researches and practices in Egypt and in general as well.

Finally, the concept of sustainable service use needs plenty of effort to be invested in Egypt, in order to remove all the current barriers which may face the implementation of this concept. It is reassuring that, the community's attitude towards the need to conserve the available natural resources was found to be very positive. This should be relied on by the service providers as they work towards reaching the sustainable city which embodies the great target most city planners are aspiring to reach.

6.5 Recommendations

This section gives some recommendations for both the government and the civil society organizations to help in accelerating the implementation of sustainable service use, as follows:

A. Recommendations for Government

- With regards to the current administrative system, the local service provider in a city like Cairo should have more power to help in accelerating the rate of achieving sustainable service consumption. This can be done through revisiting the current administrative system and distributing more power to the local provider to improve the current system.
- The National Government is asked to encourage and increase the inter-linkages between governmental bodies, to address the environmental development challenges. Example for that, the inter-linkage between the ministry of housing and the service provider bodies is highly required to address the concept of sustainable service consumption within housing policies and strategies, through setting standards for service provision. This can help in improving the situation of service provision and eliminate the illegal connection of households to services.
- Derived from government officials, the current fees collection system should be improved to add more efficiency to the collection system, especially in the water sector. This was observed and highlighted in chapter 4. The current water service

collection system is only covering 12% of the total collection. This will have its consequences on changing consumers' behaviour.

- Based on the analysis of the water consumption patterns, it was found that almost 14% of the water is being wasted in leakage. Therefore it is highly recommended for the service provider to conduct regular maintenance activities within Cairo districts to help in reducing water wasted.
- Based on the survey results, the majority of the households are keen to join conservation practices but they don't know how to conserve. Thus, the government is asked to start introducing the United Nations guidelines for consumer protection, through promoting the use of efficiency equipments in both water and electricity sector. This can be done through subsidizing these equipments and eliminate taxes on such equipments, in order to encourage people to purchase such equipments.
- Regarding policy options, it is recommended that a time framed policy plan should be developed. This policy plan should include the use of the three types of policy instruments; regulations, economic (hard measures) and self regulations (soft measures). Based on the current situation of the country, they can start by conducting awareness campaigns, to benefit from the promising level of trust within households. This can be done in parallel with the use of regulations to ban the excessive use of services. Then it can be followed by reviewing the current pricing system.

B. Recommendations for Civil Society Organizations

- According to the fact stated from the survey, the majority of the households don't know how to conserve. Thus, CSOs are asked to work on conducting workshops and campaigns focusing on giving examples on the know how to conserve in the field of water and electricity. Besides, providing the necessary information for alternative solutions for water and electricity conservation technologies and practices.
- Based on the importance of the religious factor in Cairo, it is highly recommended to work on creating pro-active actions through involving the community leaders including religious leaders, and engaging them in promoting the need to conserve service use. This can be used through the use of evident from the both the Koran and the Bible on the need to conserve.

6.6 Further Research

Based on the limitation of this research, further research is needed to be undertaken on the following fields:

- A detailed study in the field of household service behaviour on a large scale within the City of Cairo; similar to what was mentioned in the United Nation guidelines for consumer protection. This can be used as a step forward for building a strong data base for the consumer behavioural background.
- Regarding the need to revisit the current pricing system, it is highly recommended to undertake a study for identifying the level of consumption within Cairo. This can help in identifying the basic needs and the average level of consumption for both water and electricity. Afterwards, these data can be used to review the current subsidy system through introducing new tariff segments, covering only the basic needs while removing subsidies gradually from other tariff segments. Here it is important to state the need of ensuring the accessibility of low income group to any future proposed pricing system.

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Annexes

Annex 1: Interviewed officials from the government and civil society organizations

Interviewed Personnal	Position
Electricity Sector	
Mohamed Salah Elsobki, PhD	Energy Expert and Director of Energy Research centre
Ibrahim Yassin, PhD	Director of Energy Efficiency Improvement and Greenhouse Gas Reduction Project
Eng. Viola Aziz	Deputy Director of Energy Efficiency Improvement and Greenhouse Gas Reduction Project
Eng. Hatem Wahid	Head of tariff department- Deputy Director of Electric Utility and Consumer Protection Regulatory Agency
Ms. Rania Azab	Head of awareness and consumer protection department- Electric Utility and Consumer Protection Regulatory Agency
Consumer Protection Agency	
Eng. Anan Helal	Deputy Director of Consumer Protection Agency
Electricity CSOs	
Tarek Wafik, PhD	Founder of Consumer and Energy Organization (Energy Consumer Movement)
Water Sector	
Ms. Nevien Abd El-Rahman	Director of Awareness department- Holding company for water & wastewater
Mr. Khalid Salah	Director of Tariff department- Holding company for water & wastewater
Eng. Mohsen Elmesary	Deputy Director of the Egyptian Water Regulatory and Consumer Protection Agency
Water CSOs	
Eng. Soad Nada	Head of Water civil society committee
Egyptian Environmental Affaires Agency (EEAA)	
Atwa Hussien, PhD	Head of NGOs Department, EEAA

Annex 2: Interview with stakeholders

Institution

Title of Interviewed Personal

Date of interview

Questions

1. What is the annual average of household consumption rate in Cairo?
2. Has this consumption rate increased within the last few years? How much?
3. Do you think that we need to reduce the current consumption rate? Why?
4. Is there any kind of actions taken to reduce the current consumption rate? What is this action?
5. Dose your organization encourage any kind of environmentally sound service use technology?
6. Have you promoted research on consumer behaviour?
7. Have you worked on awareness campaigns or information on the benefits of sustainable consumption? What were these campaigns?
8. What is the level of coordination with CSOs in promoting such campaigns?
9. What are the current obstacles facing the implementation of sustainable service use?
10. From your opinion, what are the most appropriate policy tools to be used to promote sustainable service consumption?
11. From your opinion, what is the role of both CSOs and households in these tools?

Annex 3: Questionnaire used during the survey in the study area

General Information

Age Below 25 25-50 Above 50

Annual Income Less than 1000 \$ 1000 - 6000 \$ More than 6000 \$

Level of Education Uneducated High school University Postgraduate

Household Size 2 rooms 3 Rooms 4 Rooms More than 4 Rooms

Number of Household residents 2 persons 3 persons 4 persons More than 4

What is your average expenditure on?

Water Less than 50 LE/Month 50- 100 LE/Month 100-300 LE/Month More than 300 LE/Month

Electricity Less than 50 LE/Month 50- 100 LE/Month 100-300 LE/Month More than 300 LE/Month

Your average level of expenditure in the last six months, please tick

In Water

Raised the Same Decreased

In Electricity

Raised the Same Decreased

Level of Trust

1. Are you satisfied with the current quality for water service?

Highly Satisfied Satisfied Neutral Not Satisfied

2. Are you satisfied with the current quality for electricity service?

Highly Satisfied Satisfied Neutral Not Satisfied

3. Do you feel the service provider sufficiently encourages sustainable consumption behaviour? And Why?

Water Yes No

Electricity Yes No

Why

Level of Awareness

1. How many water use equipments do you have?

(Example: Dish washer and washing machine)

- 1 2 3 More than 3

2. Do you have any kind of conservation practices for water?

(Example: having certain technology for saving water, toilet flushing)

- Yes No

3. What kind of water saving measures are you following?

4. How many electric device you have?

- 1 2 3 More than 3

5. Do you have any kind of energy efficient equipments?

(Example: Energy efficient light bulb, electric efficient device)

- Yes No

6. What are these equipments?

7. What kind of energy saving measures are you following?

8. Do you believe that your level of consumption is affecting the environment? And why?

In Water

Strongly Agree Agree Neutral Don't Agree

In Electricity

Strongly Agree Agree Neutral Don't Agree

Why

Level of Responsibility

1. in your daily consumption behaviour, how often do you consider the environmental impact of your behaviour?

Strong Consideration Consider it Neutral Don't consider it

2. in your family, who is the most concerned about water and electricity conservation?

3. Are you interested to follow any consumption conservation practices?

In Water

Yes No

In Electricity

Yes No

Communication Campaigns

1. Have you heard about the electricity utility and consumer protection?

Yes No

2. Have you heard about the awareness campaigns from the water company?

Yes No

3. Have you ever seen any kind of campaigns or activities to promote conservation practices? Where did you find it and what was it?

Yes No

Factors Affecting Behaviour

1. Why you would follow consumption conservation practices, please arrange from 1-5 and why?

- To reduce the environmental impacts of my behavior
- To reduce my financial expenditure on services
- Because my religion had taught me that I should be efficient in my consumption rate
- Because I am fully convinced with this conservation policies from my surrounding friends and families
- Because I am fully convinced with this conservation policies from Campaigns
- Other Reason, Please state

Best Policy Option

1. If the pricing system of Water services is raised you will;

- Reduce your consumption Rate
- My consumption rate will remain the same
- Consumption Rate will increase

2. If the pricing system for Electricity services is raised you will;

- Reduce your consumption Rate
- My consumption rate will remain the same
- Consumption Rate will increase

3. Do you think that the government should take more actions towards sustainable consumption?

- Yes
- No

Why?

4. What is the most impressive median for water and electricity conservation campaigns?

- Government
- NGOs
- Both
- Other, Please State

Why?

5. What is the most appropriate action, to promote sustainable consumption?

- Regulatory Action (standards for service use)
- Economically Action (new pricing structure, incentives and grants)
- Voluntary Action from my side (using consumption conservation equipments and awareness campaigns)
- All together