



Submitted to :  
 Egyptian Natural Gas Holding Company **EGAS**

Prepared by: **EcoConServ**  
 ENVIRONMENTAL SOLUTIONS

**EcoConServ Environmental Solutions**  
 12 El-Saleh Ayoub St., Zamalek,  
 Cairo, Egypt 11211  
 Tel: + 20 2 27359078 – 2736 4818  
 Fax: + 20 2 2736 5397  
 E-mail: [genena@ecoconserv.com](mailto:genena@ecoconserv.com)

## ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FRAMEWORK

### Executive Summary

## NATURAL GAS CONNECTION PROJECT IN 11 GOVERNORATES IN EGYPT

(Final March 2014)

## List of acronyms and abbreviations

AFD	Agence Française de Développement (French Agency for Development)
AP	Affected Persons
ARP	Abbreviated Resettlement Plan
ALARP	As Low As Reasonably Practical
AST	Above-ground Storage Tank
BUTAGASCO	The Egyptian Company for LPG distribution
CAA	Competent Administrative Authority
CULTNAT	Center for Documentation Of Cultural and Natural Heritage
CAPMAS	Central Agency for Public Mobilization and Statistics
CDA	Community Development Association
CRN	Customer Reference Number
EDHS	Egyptian Demographic and Health Survey
EHDR	Egyptian Human Development Report 2010
EEAA	Egyptian Environmental Affairs Agency
EGAS	Egyptian Natural Gas Holding Company
EIA	Environmental Impact Assessment
EMU	Environmental Management Unit
ENIB	Egyptian National Investment Bank
ES	Environmental and Social
ESDV	Emergency Shut Down Valve
ESIAF	Environmental and Social Impact Assessment Framework
ESMF	Environmental and Social Management Framework
ESMMF	Environmental and Social Management and Monitoring Framework
ESMP	Environmental and Social Management Plan
FGD	Focus Group Discussion
HH	Households
GASCO	Egyptian Natural Gas Company
GCR	Greater Cairo Region
GIS	Global Information Systems
GOPP	General Organization for Physical Planning
GPS	Global Positioning System
HHH	Head of the Household
HDR	Human Development Report
HP	High Pressure
HSE	Health Safety and Environment
IDSC	Information and Decision Support Center
IFC	International Finance Corporation
IGEM	Institute of Gas Engineers and Managers
IR	Involuntary Resettlement
JICA	Japan International Cooperation Agency
LDC	Local Distribution Companies (Egypt Gas and Town Gas)
LDU	Local Development Unit
LPG	Liquefied Petroleum Gas
LFL	Lower Flammable Limit
LP	Low Pressure
mBar	milliBar



MSEA	Ministry of State for Environmental Affairs
MSDS	Material Safety Data Sheet
NG	Natural Gas
NGO	Non-Governmental Organizations
P&A	Property and Appliance Survey
PAF	Project Affected Family
PAP	Project Affected Persons
PE	Poly Ethylene
PPM	Parts Per Million
PRS	Pressure Reduction Station
PSV	Pressure Safety Valve
QRA	Quantitative Risk Assessment
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
S HP	Steel High Pressure pipelines
SDO	Social Development Officer
SFD	Social Fund for Development
SIA	Social Impact Assessment
SRO	Social and Resettlement Officer
SSIAF	Supplementary Social Impact Assessment Framework
SYB	Statistical Year Book 2010
T/E Gas	Town Gas/Egypt Gas
TOR	Terms of Reference
Town Gas	The Egyptian Company for Natural Gas Distribution for Cities
UNDP	United Nations Development Program
UFL	Upper Flammable Limit
UNDP	United Nations Development Program
UST	Underground Storage Tank
WB	The World Bank
WHO	World Health Organization
\$	United States Dollars
€	Euros

Exchange Rate: US\$ = 7.00L.E as of January 2014

Exchange Rate: € = 9.60L.E. as of January 2014



## Contents

<b>List of acronyms and abbreviations</b>	<b>1</b>
<b>List of Tables</b>	<b>5</b>
<b>List of Figures</b>	<b>5</b>
<b>1 Introduction</b>	<b>6</b>
<b>1.1 Project Objectives</b>	<b>7</b>
<b>1.2 Objectives of the ESIA Framework Study</b>	<b>8</b>
<b>2 Project Description</b>	<b>8</b>
<b>2.1 Background</b>	<b>8</b>
<b>2.2 Coverage Framework</b>	<b>10</b>
<b>2.3 Project Components</b>	<b>10</b>
2.3.1 Design and material take-off (MTO) including procurement	10
2.3.2 Piping and connections	10
2.3.3 Pressure Reduction Stations	10
<b>2.4 Activities of the Construction Phase</b>	<b>11</b>
2.4.1 Mobilization of equipment, materials and workers	11
2.4.2 Excavation and pipe laying	11
2.4.3 Leakage testing	11
2.4.4 Connections to households	11
2.4.5 Conversion of appliances	11
2.4.6 Construction works for PRSs and regulators	11
<b>2.5 Activities of the operation phase</b>	<b>11</b>
2.5.1 Operation of the PRS	11
2.5.2 Operation of the network	11
2.5.3 Repairs in households	11
<b>3 Legislative and Regulatory Framework</b>	<b>12</b>
<b>3.1 Preface</b>	<b>12</b>
<b>3.2 ESIA NATIONAL ADMINISTRATIVE AND LEGAL FRAMEWORK</b>	<b>12</b>
<b>3.3 Applicable Environmental and Social Legislation in Egypt</b>	<b>13</b>
3.3.1 Law 217/1980 for Natural Gas	13
3.3.2 Law 4/1994 for the Environment (amended by Law 9/2009)	13
3.3.3 Law 38/1967 for General Cleanliness	13
3.3.4 Law 93/1962 for Wastewater	13
3.3.5 Law 117/1983 for Protection of Antiquities	13
3.3.6 Traffic planning and diversions	13
3.3.7 Work environment and operational health and safety	13
3.3.8 EEAA ESIA guidelines related to the Public Consultation	13
3.3.9 Land Acquisition and Involuntary Resettlement	13
3.3.10 Relevant international treaties to which Egypt is a signatory	13
<b>3.4 Applicable World Bank Safeguard Policies</b>	<b>13</b>
3.4.1 OP 4.01 – Environmental Assessment	13
3.4.2 OP 4.11 – Physical Cultural Resources	13
3.4.3 OP 4.12 – Involuntary Resettlement	13
<b>4 Description of the Environment</b>	<b>13</b>
<b>4.1 Introduction of the 11 governorates</b>	<b>13</b>
<b>4.2 Selected background data</b>	<b>13</b>
<b>4.3 Basic Demographic Characteristics</b>	<b>17</b>
4.3.1 Population Characteristics	17
4.3.2 Living Conditions	18
4.3.3 Access to Basic Services	19
4.3.4 Human Development Profile	19
4.3.5 Poverty index	20
4.3.6 Income and expenditure	20
4.3.7 Fuel currently used in households	21
4.3.8 Problems faced with the current household fuel	22
4.3.9 Perception towards the project	22



4.3.10	Willingness to pay	23
<b>5</b>	<b>Environmental and Social Impacts</b>	<b>24</b>
<b>5.1</b>	<b>Introduction</b>	<b>24</b>
<b>5.2</b>	<b>Positive Impacts</b>	<b>24</b>
5.2.1	During the construction phase	24
5.2.2	During the operation phase	24
<b>5.3</b>	<b>Potential Negative Impacts during Construction</b>	<b>25</b>
5.3.1	Reduction of Traffic Flow ( <i>disruption of local and regional traffic</i> )	26
5.3.2	Air Emissions	26
5.3.3	Noise	26
5.3.4	Risk on Infrastructure and underground utilities	26
5.3.5	Possible effects on structures	27
5.3.6	Effect on Culturally Valuable Sites	27
5.3.7	Effect on ecological systems	27
5.3.8	Solid and Liquid Waste Disposal	27
5.3.9	(رد الشيء لأصله) Restoration	28
5.3.10	Potential Impacts of PRS Construction	28
<b>5.4</b>	<b>Potential Negative Impacts during Operation</b>	<b>28</b>
5.4.1	User health and safety	28
5.4.2	Improper handling of the Odorant	28
5.4.3	Noise of PRS	29
5.4.4	Safety Aspects of PRS Operation	29
5.4.5	Integrity of the pipelines	29
5.4.6	Potential negative Socioeconomic impacts during operation	29
<b>6</b>	<b>Analysis of Alternatives</b>	<b>31</b>
<b>6.1</b>	<b>No Project Alternative</b>	<b>31</b>
<b>6.2</b>	<b>Energy Alternatives</b>	<b>31</b>
<b>6.3</b>	<b>Piping material Alternatives</b>	<b>32</b>
<b>6.4</b>	<b>Sequence of work progress (in various areas) Alternatives</b>	<b>32</b>
<b>6.5</b>	<b>Sequence of work progress (within area) Alternatives</b>	<b>33</b>
<b>6.6</b>	<b>Routing Alternatives</b>	<b>33</b>
<b>6.7</b>	<b>Installation costs</b>	<b>34</b>
<b>7</b>	<b>Environmental and Social Management &amp; Monitoring Framework</b>	<b>35</b>
<b>7.1</b>	<b>Objectives of the ESM&amp;MF</b>	<b>35</b>
<b>7.2</b>	<b>Management and Monitoring activities During Construction Phase</b>	<b>37</b>
7.2.1	Management of Traffic	37
7.2.2	Management of Air Emissions	37
7.2.3	Management of Noise	37
7.2.4	Management of Excavation Activities Posing Risk on Utilities	37
7.2.5	Management of Activities Posing Risk on Structures Stability	37
7.2.6	Management of Culturally Valuable Sites	37
7.2.7	Management of Waste Disposal	37
7.2.8	(رد الشيء لأصله) Management of Street Restoration after asphalt breaking	37
7.2.9	Management of grievances ( <i>Environmental and Social Grievance Redress Mechanisms</i> )	37
<b>7.3</b>	<b>Environmental Management Matrix during CONSTRUCTION</b>	<b>42</b>
<b>7.4</b>	<b>Environmental Monitoring Matrix during CONSTRUCTION</b>	<b>50</b>
<b>7.5</b>	<b>Social Management Matrix during CONSTRUCTION</b>	<b>52</b>
<b>7.6</b>	<b>Social Monitoring Matrix during construction</b>	<b>54</b>
<b>7.7</b>	<b>Management and Monitoring activities During Operation Phase</b>	<b>56</b>
7.7.1	User health and safety	56
7.7.2	Management of Odorant Handling	56
7.7.3	Management of Repairs and Maintenance	56
7.7.4	Management of PRS noise	56
7.7.5	Management of PRS Safety Aspects	56
7.7.6	Management of network integrity	56
<b>7.8</b>	<b>Environmental Management Matrix during OPERATION</b>	<b>57</b>
<b>7.9</b>	<b>Environmental Monitoring Matrix during OPERATION</b>	<b>59</b>



<b>7.10 Social Management Matrix during OPERATION</b>	<b>60</b>
<b>7.11 Social Monitoring Matrix during operation</b>	<b>62</b>
<b>7.12 Reporting of Mitigation and Monitoring Activities</b>	<b>63</b>
<b>7.13 Institutional Framework for ESM&amp;MF Implementation</b>	<b>64</b>
7.13.1 Existing Environmental Management Structures	64
7.13.2 Roles and responsibilities of EGAS and LDCs Social Development Officers	64
7.13.3 Required Resources	64
<b>7.14 ESM&amp;MP Budget Summary</b>	<b>66</b>
<b>8 Stakeholder Engagement and Public Consultation</b>	<b>67</b>
8.2.1 Public scoping sessions	69
8.2.2 Data collection activities	71
8.2.3 Final public consultations	72

## List of Tables

Table 2-1: Existing household coverage in the 11 governorates and connections planned (this project) ..	10
Table 2-2: Required locations / capacities of PRSs with associated steel 70-Bar pipeline lengths .....	10
Table 7-1: Summary of impacts significance .....	36
Table 7-2: Current grievance mechanism adopted in the NG companies.....	37
Table 7-3: Environmental Management Matrix during CONSTRUCTION .....	42
Table 7-4: Environmental Monitoring Matrix during CONSTRUCTION .....	50
Table 7-5 : Social Management Matrix during CONSTRUCTION.....	52
Table 7-6: Social Monitoring Matrix during CONSTRUCTION.....	54
Table 7-7: Environmental Management Matrix during OPERATION .....	57
Table 7-8: Environmental Monitoring Matrix during OPERATION .....	59
Table 7-9: Social Management Matrix during OPERATION.....	60
Table 7-10: Social Monitoring Matrix during OPERATION .....	62
Table 7-11: Recommended Training Courses for EGAS/Town/Egypt Gas staff .....	64
Table 7-12 : Recommended Training Courses for Social Development Officers.....	65
Table 8-1 Main stakeholders identified for the Framework.....	68
Table 8-2: 11 Consultation activities conducted during the final consultation phase.....	72
Table 8-3: Key comments and concerns raised during the Final Public Consultations .....	74

## List of Figures

Figure 2-2: Locations of the 11 governorates of the proposed natural gas connections project....	9
--	---



## 1 Introduction

The Government of Egypt (GoE) has immediate priorities to increase household use of natural gas by connecting 800,000 households/yr. to the gas distribution network to replace the highly subsidized, largely imported Liquefied Petroleum Gas (LPG). The GoE is implementing an expansion program for Domestic Natural Gas connections to an additional 2.5 Million households over the next 3 to 6 years. As part of the program, the project presented in this framework study involves extending the network and accompanying infrastructure to connect 1.1 Million Households in 11 Governorates between 2014 and 2017 with the assistance of a World Bank Loan of up to US\$500 Million and the Agence Française de Développement (French Agency for Development) financing of up to €70 Million. The total program for connecting the prospective 1.1 Million customers is estimated to cost US\$850 Million.

The proposed investments are part of the household gas connection investments in service areas in the 11 governorates under the concessions of two distribution companies; **Town Gas** in the Giza, Ismailia, Alexandria, and Marsa Matrouh governorates, and **Egypt Gas** in Qalubia, Menufia, Daqahlia, Qena, Sohag, Gharbia, and Aswan governorates. The Project will include the following components:

- **Component 1: Gas Distribution Network and Household Connections.** This includes expansion of the intermediate and low pressure gas distribution networks, installation of control units and conversions of customer appliances to allow connection of and supply of gas to the proposed new 1.1 million households.
- **Component 2: Pressure Reduction Stations (PRs)** for reduction of NG pressure from 70 Bar to 7 Bar and odorant addition for residential users. The construction of PRs to connect the distribution networks in the project areas to the high pressure gas transmission networks. Currently, 25 new PRs are being considered for financing by the proposed project.
- **Component 3: Gas Transmission Connection.** This component includes extending the gas high pressure transmission network to supply gas to the new PRs in the project areas. Twenty high pressure pipeline connections are currently being considered ranging from 50m – 38km of about 178 km total length.

To encourage household participation, EGAS continues to apply a 2005 connection policy that sets the household connection fee for a new connection to the network at LE 2,500 nationwide of which the household pays LE 1,500 and EGAS contributes LE 1,000 that is paid to the relevant distribution companies. The household connection fee is assumed to cover the cost of installation to the distribution companies while EGAS also shares the cost of network expansion and Pressure Reduction Station.

The total cost of household gas connection is L.E. 5400 with a breakdown of, L.E. 2400: cost share of steel pipeline network and Pressure Reduction Stations, L.E. 1200: Cost share of ground network inside cities, L.E. 960: Cost share of building external networks and L.E. 840: cost share of internal networks and conversions.

To enable the connections, significant upfront network investment is required. As such, network development and connections in household premises happen simultaneously across the targeted project areas. Therefore, although the main features of the project have been identified; details of pipeline routings, locations of Pressure Reducing Stations, and exact households to be



connected have not been confirmed at this stage. Such details will be completed during the course of implementation of the project.

World Bank Environmental and Social Safeguard policies require an Environmental & Social Impact Assessment (ESIA) of the proposed project. Given that the final selection of the exact paths of the gas pipelines, pressure reduction stations, and distribution networks will be made during the course of implementation of the project, the current study will develop an Environmental and Social Impact Assessment *Framework* (ESIAF). In addition to assessing environmental and social impacts based on the project details currently available, the framework sets the road map for addressing the requirements of the Egyptian Environmental Affairs Agency (EEAA) and the relevant World Bank Environmental and Social Safeguard Policies in site-specific ESIAFs which are to be prepared upon finalization of project details.

This Environmental and Social Impact Assessment *Framework* Study has been prepared based on the Terms of Reference prepared by EGAS and cleared by the World Bank, aiming at providing an overview of the anticipated environmental and social safeguard issues related to natural gas distribution and connections to households in 11 governorates; and to develop environmental guidelines to be followed for the subsequent gradual phased implementation of the Project.

With regards to the social aspects, a through desktop review and analysis of primary data was carried out. Special attention was paid to potential Project Affected People as well as vulnerable groups who were investigated using multi-levels of data collection tools. In addition to deliverables required by the ToR (ESIAF and Resettlement Policy Framework), it was recommended by the WB to **deliver a stand-alone** Supplementary Social Impact Assessment Framework (**SSIAF**). The SSIAF should be referred to for detailed social data and assessments.

No major environmental or social risks could be foreseen to prevent reaching the 1.1 million customer target over the proposed 3-year timeframe. The extensive experience gained, by EGAS and affiliates, through implementation of the previous WB- and GoE-funded Natural Gas Connection project in Greater Cairo (and all over Egypt) will play a critical role in the minimizing environmental and social risks and maximizing public ownership and acceptance.

## 1.1 Project Objectives

---

The proposed project represents an integral component of the National energy strategy which calls for greater use of natural gas for domestic users and reduction of government subsidies of the energy sector (LPG). The project will contribute to achieving the Government plan for extending domestic natural gas connections in the country and is planned for completion within 3 years (2014-2017). The following results are envisaged from the project:

- Wider NG coverage and stable household energy supply
- Reduced leakage and fire risk compared to LPG
- Reduced LPG cylinder prices due to lower demand
- Reduced hardships to the physically challenged, women, and the elderly
- Reduced costs compared to butane gas (LPG) and electricity in Egypt
- Reduced strategic dependence on imported fuel (LPG)
- Rationalization of subsidies for LPG cylinders.





## 1.2 Objectives of the ESIA Framework Study

In addition to assessment of environmental and social impacts based on the available level of project details, the specific objective of the study is to develop an ESIA Framework as a “road map” for addressing the following key modules once the final detailing of the project components is complete:

- Describing project components and activities of relevance to the environmental and social impacts assessments
- Identifying and addressing relevant national and international legal and technical requirements and guidelines pertaining to project-related environmental, social, and occupational health & safety issues;
- Performing stakeholder meetings, scoping sessions, and public consultations to maximize public ownership and stakeholder engagement
- Describing baseline environmental and social conditions, obtaining key data relevant to the NG connection project, and identifying relevant governmental, administrative, and civil society institutions
- Assessing the potential environmental and social impacts of the project in the project areas;
- Developing an environmental and social management and monitoring plan for the mitigation of negative impacts and for monitoring compliance with the relevant environmental laws

Overall, a key objective of each of the sections of this study is to provide a framework for addressing the various components of the specific ESIAFs which will be prepared upon final detailing of the project. Governorate-level ESIAFs covering the final project components to be implemented will be prepared, cleared, and disclosed prior to commencement of mobilization and construction.

The scope of the ESIAF is to assess the environmental and social impacts of extensions of new high-pressure steel pipes to the project areas (or installation of new pipelines), pressure reduction stations, and distribution networks serving the various project areas. Impacts of NG exploration, extraction, refining, and transmission are outside the scope of the ESIAF

## 2 Project Description

### 2.1 Background

The National Natural Gas Grid was established 1975 with 75 km total piping length. Current total piping length reached over 35,000 km with a daily capacity of 205 m<sup>3</sup>. National consumption of natural gas in 2012/2013 is estimated at 52 billion cubic meters, while 6.7 billion cubic meters (11%) were exported. Annual national consumption of Natural Gas is dominated by the electricity sector (power plants) and various industrial sectors. Current domestic/residential users (households) consume a mere 3% of the total annual NG production

The Natural Gas Grid in Egypt is fed by numerous gas production fields and treatment facilities for transmission to industrial, commercial, domestic users, and power plants. Main gas production fields are Ras Shokeir, Ras Gharib, Abu Madi and Abu El Gharadik.



To date, the Natural Gas Network has already reached all but 2 of the 27 Egyptian governorates. Matrouh (26) and ElWadi El Gideed (27) were deemed too distant from the existing network to fulfill the minimum levels of economic and technical feasibility. Domestic user coverage (households) varies to great degree from one governorate to the next. As of November 2013, connections in Cairo, Giza, and Alexandria total 3.5 Million households out of the nationwide total of 5.7 Million households connected. As mentioned above, the project proposed in this study aims to add 1.1 Million Households in the 11 governorates to the existing 5.7 Million.

The NG is processed and injected into the high pressure lines of the national Grid (70 Bar) for transmission. Upon branching from the main lines to regional distribution networks, the pressure of the NG is lowered to 7 Bar at the Pressure Reduction Stations (PRS). An odorant is added to the NG at PRSs feeding distribution networks to residential areas<sup>1</sup> in order to facilitate detection. Regulators are then used to further lower the pressure to 100 mbar in the local networks, before finally lowering the pressure to 20 mbar for domestic use within the households. In addition to excavation and pipe laying, key activities of the construction phase also include installation of pipes on buildings, internal connections in households, and conversion of appliance nozzles to accommodate the switch from LPG to NG.



Figure 2-1: Locations of the 11 governorates of the proposed natural gas connections project

<sup>1</sup> Because natural gas is odorless, odorants facilitate leak detection for inhabitants of residential areas.



## 2.2 Coverage Framework

Preliminary project planning has applied social, economic, safety, and technical criteria to identify 96 districts and villages in 11 Governorates as targets for connecting the 1.1 million customers (households). The project shall introduce the service in new areas, which have not been connected before, and shall further extend the network in areas which are partially covered.

**Table 2-1: Existing household coverage in the 11 governorates and connections planned (this project)**

Governorate	Connected Households (To November 2013)	Additional HH planned during this project			Total (This project) Planned (HH)
		2014-2015	2015-2016	2016-2017	
Giza	992932	85000	119000	77000	281000
Alexandria	733579	10000	92000	77000	179000
Qalyubia	382012	49000	28500	50000	127500
Gharbia	243556	4000		25500	29500
Dakahlia	149060	9000	32000	90500	131500
Menufia	134511	10000	23000	13000	46000
Ismailia	84997		42000	20500	62500
Sohag	47116	14000		57000	71000
Aswan	16000	20000	27000		47000
Qena	8079	25000	66500		91500
Matruh	-	10000	10000	10000	30000
<b>Total</b>	<b>5,735,110</b>	<b>236,000</b>	<b>440,000</b>	<b>420,500</b>	<b>1,096,500</b>

## 2.3 Project Components

The project involves design, planning, excavation, construction, testing, and monitoring for:

### 2.3.1 Design and material take-off (MTO) including procurement

### 2.3.2 Piping and connections

### 2.3.3 Pressure Reduction Stations

**Table 2-2: Required locations / capacities of PRSs with associated steel 70-Bar pipeline lengths<sup>2</sup>**

Town Gas			
Governorate	PRS location	PRS Capacity (sm <sup>3</sup> /h)	70-bar steel lines (m)
Giza	Giza North	20,000	3000
	Giza South	40,000	6500
	Atfih	5,000	200
Alexandria	ElAmriya	20,000	3000
Ismailia	ElQantara Sharq	20,000	1000
	ElQantara Gharb	10,000	200
	Fayed	5,000	200
	Abu Swair	5,000	3000
Matrouh	Matrouh	15,000	4000
<b>Town Gas Total</b>		<b>9 PRSs</b>	<b>21 km</b>

<sup>2</sup> Exact locations of the required PRS's are currently not identified and will be determined at later stages  
Egyptian Natural Gas Holding Company (EGAS)



Egypt Gas			
Qaliobia	Qaha	5,000	50
Gharbia	Qotoor	5,000	100
Dakahlia	Belkass	5,000	100
	ElManzala	5,000	16000
	Mit Salseel	5,000	12000
	Dekernes	5,000	25000
Qena	Qena	20,000	7000
	Nagada	5,000	6000
	Qift	5,000	100
	ElWaqf	5,000	8500
	Abu Tisht	5,000	6000
Sohag	Tama	5,000	5000
	Jerja	20,000	5000
	Jehaina	15,000	5000
Aswan	Kom Ombo	10,000	23000
	Edfu	10,000	38000
Egypt Gas Total		16 PRSs	157 km
Total Egypt Gas and Town Gas		25 PRSs	178 km

## 2.4 Activities of the Construction Phase

### 2.4.1 Mobilization of equipment<sup>3</sup>, materials and workers

### 2.4.2 Excavation and pipe laying

### 2.4.3 Leakage testing

### 2.4.4 Connections to households

### 2.4.5 Conversion of appliances

### 2.4.6 Construction works for PRSs and regulators

## 2.5 Activities of the operation phase

### 2.5.1 Operation of the PRS

### 2.5.2 Operation of the network

### 2.5.3 Repairs in households

<sup>3</sup> Updated manufacturer catalogues including specifications and environmental parameters should be included as an annex to the site-specific ESIA report. Emphasis should be placed on high noise and air emitters such as the paving breaker and excavators.



## 3 Legislative and Regulatory Framework

### 3.1 Preface

The World Bank has defined 10 environmental and social safeguard policies that must be considered to its financed projects (for both framework and specific assessments), if applicable. Applicability of such policies to this project is overviewed and discussed in subsequent sections

There are no specific Egyptian legal or regulatory requirements for preparing framework documents such as this one. However, this chapter of the ESIAF is meant to outline the legal and regulatory guidelines to be addressed in preparation of the specific ESIA upon finalization of project detailing.

It is important to note that, in the case of ESIA FRAMEWORK studies such as this one, the EEAA issues a “No Objection” rather than an approval. The conditions of the “No Objection” verdict are expected to stipulate that detailed ESIA studies must be carried out upon finalization of project detailing (final pipeline routes, exact locations of PRSs, etc.).

Following loan approval by the World Bank and the Agence Française de Développement, design and alignment details will be finalized. Once final project designs, alignments, components, and activities are determined, site-specific ESIA should be prepared and presented to the Egyptian Environmental Affairs Agency for approval and environmental permitting.

### 3.2 ESIA NATIONAL ADMINISTRATIVE AND LEGAL FRAMEWORK

The main legal instrument dealing with environmental issues in Egypt is Law 4/1994, amended by Law 9/2009 and Executive Regulation 1095/2011 modified by 710/2012, commonly known as the Law on Protection of the Environment. The law deals mostly with the protection of the environment against pollution. Prime Ministerial Decree 631 of 1982 established the EEAA as the competent body for environmental matters in Egypt. Law 4 also stipulates the role of the EEAA as the main regulatory agency for environmental matters.

An ESIA is required to be viewed as an integrated part of the project planning process, according to EEAA requirements. The ESIA will help to ensure that environmental concerns are taken into account along with technical and economic considerations.

After submission of an ESIA for review, the EEAA may request revisions in the ESIA report within 30 days, including additional mitigation measures, before issuing the approval of the report. EGAS will have the right to issue an appeal within 30 days from its receipt of the EEAA’s decision. It should be noted that once the ESIA has been approved, the ESMP as will be presented in the report, will be considered an integral part of the project; and the EGAS will be legally responsible for the implementation of that plan, depending on their involvement in construction or operation. It is therefore worth mentioning that the EGAS and its project implementing entities (Town Gas and Egypt Gas) must ensure that all mitigation measures and environmental requirements described in the ESMP have been clearly referred to in the tender documents for the construction works, the construction contracts, and have been respected. EGAS will follow-up on the construction contractor to ensure that the ESMP is adequately implemented in the construction phase.



### 3.3 Applicable Environmental and Social Legislation in Egypt

- 3.3.1 Law 217/1980 for Natural Gas
- 3.3.2 Law 4/1994 for the Environment (amended by Law 9/2009)
- 3.3.3 Law 38/1967 for General Cleanliness
- 3.3.4 Law 93/1962 for Wastewater
- 3.3.5 Law 117/1983 for Protection of Antiquities
- 3.3.6 Traffic planning and diversions
- 3.3.7 Work environment and operational health and safety
- 3.3.8 EEAA ESIA guidelines related to the Public Consultation
- 3.3.9 Land Acquisition and Involuntary Resettlement
- 3.3.10 Relevant international treaties to which Egypt is a signatory

### 3.4 Applicable World Bank Safeguard Policies

- 3.4.1 OP 4.01 – Environmental Assessment
- 3.4.2 OP 4.11 – Physical Cultural Resources
- 3.4.3 OP 4.12 – Involuntary Resettlement

## 4 Description of the Environment

### 4.1 Introduction of the 11 governorates

The geographical spread of the project over 11 governorates, from the southern governorates (Aswan, Qena, and Sohag) to the northernmost (Alexandria) and from eastern governorates (Ismailia) to the westernmost (Matrouh), yields a diverse array of baselines for the project areas.

### 4.2 Selected background data

#### Alexandria Governorate

The governorate is bordered to the north by the Mediterranean Sea, to the east by El Behera and to the west by Matrouh Governorate.

Alexandria's total area comes to 2300.0 km<sup>2</sup>, and is divided into one Markaz, one city, 7 districts, and 3 rural local units.

Alexandria is an industrial governorate where 40% of Egyptian industries are concentrated, especially chemicals, food, spinning and weaving as well as oil industries and fertilizers. Borg Al-Arab city was established to be an industrial, housing and agricultural city to absorb the current and future population increase.



### Matrouh Governorate

Matrouh Governorate occupies a unique location on the Mediterranean Sea serving as the hub between Egypt and the Arab Maghreb (North Africa).

The governorate's total area comes to 166563 km<sup>2</sup>, forming 16.5% of the country's total area. It is divided into 8 Markaz, 8 cities, and 56 rural local units with 1 affiliated village.

Main activities of the population are trade, sheep and camel breeding as well as cultivation of figs and olives.

### Daqahlia Governorate

Daqahlia Governorate is located in the Delta Region. The governorate's total area comes to 3538.20 km<sup>2</sup>, forming 0.4% of the country's total area. It is divided into 16 Markaz, 19 cities, 2 districts, and 120 rural local units with 366 affiliated villages. The governorate's population reaches 5.6 million recording a normal increase rate of 22.30 per thousand.

Daqahlia serves as the base of the rich Nile Delta triangle, and is ranked among the main agricultural governorates. It is advantaged by rich water resources and fish wealth. It is also famous for the production of meat, poultry and dairy products.

Daqahlia also hosts major industrial facilities spreading all over the governorate, and is famous for large and diversified industries, most important of which are chemicals - spinning and weaving garments - hydrogenated oils - soap - rice milling - grain mills – cotton ginning - milk - and printing and publishing . In addition, small and indigenous industries are common in villages and hamlets.

The governorate won worldwide fame for hosting specialized medical centers and hospitals. Some of these centers include: urology and nephrology, and ophthalmology.

### Qalubia Governorate

Qalubia Governorate is part of the Greater Cairo region. It lies in the east of the Nile at the top point of the Delta. It is bordered to the south by Cairo and Giza Governorates and to the north by Daqahlia and Gharbeia Governorates, to the east by Sharqiah Governorate and Menufia to the west. Shoubra El Khaima city is the starting point of the agricultural highway to Lower Egypt governorates, as such Qalubia is held as liaison connecting between lower Egypt and Upper Egypt governorates.

The governorate's total area comes to 1124.30 km<sup>2</sup>, forming 0.1% of the country's total area. It is divided into 7 Markaz, 10 cities, 2 districts, and 50 rural local units with 147 affiliated villages.

In addition, Shoubra El Khaima hosts the largest industrial cluster including several factories of: spinning and weaving, electric appliances, plastics, vehicles, oil refining, food packing and processing, metal products, in addition to Abo Za'bal industrial zone which is famous for fertilizers and chemicals industries.



### Gharbeia Governorate

Gharbeia is located in the center of Delta region

The governorate's total area comes to 1942.30 km<sup>2</sup>, forming 0.2% of the country's total area. It is divided into 8 Markaz, 8 cities, 4 districts, and 70 rural local units with 251 affiliated villages.

The governorate is renowned for growing traditional crops such as cotton, rice, wheat, beans, maize and fruits, in addition to Jasmine, and medical herbs and plants, of which, extracts and pastes are exported. The governorate is also famous for growing potatoes for exports and local market.

Gharbeia is a lead governorate in livestock and poultry breeding. In the industry field, it hosts large industries including spinning and weaving.

### Menufia Governorate

Menufia Governorate is part of the Delta Region .The governorate's total area comes to 2499 km<sup>2</sup>, forming 0.2% of the country's total area. It is divided into 9 Markaz, 10 cities, 2 districts, and 70 rural local units with 245 affiliated villages.

It is known of its fertile soil, agriculture is the main activity in the governorate. It is famous for growing cotton, maize, wheat and vegetable.

The governorate contributes also to the industrial activity as it hosts large industries such as spinning and weaving. Furthermore, it is famous for the silk carpet industry for exporting purposes. The governorate experienced a huge industrial movement reflected in establishing several industrial facilities and other developmental projects that created job opportunities.

In addition, the governorate hosts many industrial zones which provide great investment potentials and incentives.

### Ismailia governorate

Ismailia is Egypt's eastern gateway to the Asian Continent and the Asian Arab and Islamic countries. The governorate lies on Suez Canal banks and is bordered by Port Said to the north and Suez to the south.

The governorate's total area is 5067 km<sup>2</sup>, forming 0.5% of the country's total area. It is divided into 6 Markaz, 7 cities, 3 districts, and 33 rural local units with 5 affiliated villages.

Ismailia offers several investment opportunities, most important of which are: industrial investment carried out in the first and second industrial zones. The industrial zones had been connected to roads accessing the Egyptian ports and the duty free zone in Ismailia,





### Giza Governorate

Giza is one of Greater Cairo region urban governorates.

The governorate's total area reaches 13184 km<sup>2</sup>, forming 3% of the country's total area. The governorate is divided into 9 Markaz, 11 cities, 8 districts in addition to 48 rural local units with 120 affiliated villages.

Giza is privileged with plenty of ancient Pharoanic monuments, placing it second after Luxor city in this regard. Most Important monuments include Giza pyramids, the Sphinx, Cheops Ship.

### Sohag Governorate

Sohag Governorate belongs to south Upper Egypt Region which includes Aswan, Sohag, Luxor, Qena, and the Red Sea The governorate's total area comes to 11218.10 km<sup>2</sup>, forming 1.1% of the country's total area. It is divided into 11 Markaz, 11 cities, 3 districts, and 51 rural local units with 213 affiliated villages.

Agriculture serves is the main economic activity of the governorate which is known for growing wheat, cotton, and onions, as well as livestock and poultry production.

The governorate pays great attention to the industrialization and motivation of investors. This trend is reflected in the industrial complex (Nile Company for Oil and Detergents, spinning and weaving, onion dehydration, beverages and sugar in Gerga).Recently, Sohag established four industrial zones in El Kawthar district and 3 other industrial zones: west Tahta, west Gerga, and Ahayiwia Shark.

### Qena Governorate

Qena Governorate is part of the south Upper Egypt Region. The governorate's total area comes to 8979.80 km<sup>2</sup>, forming 0.9% of the country's total area. It is divided into 9 Markaz, 9 cities, and 41 rural local units with 111 affiliated villages. Qena is an agri- industrial governorate. It ranks first in the production of sugar cane, tomatoes, bananas, sesame, and hibiscus.

Several factories operate in the governorate including 3 sugar factories, and one spinning and weaving, in addition to the Aluminum Complex standing as the largest industrial facility in the Middle East .

Qena also hosts two industrial zones; the First Industrial Zone situated in Kalaheen at Qaft Markaz. The Second Industrial Zone is at Yahaw in Nagg`a Hammady. Another small industries cluster is located in Salehia at Qena markaz.



## Aswan Governorate

Aswan governorates is part of the southern Upper Egypt region. It serves as Egypt's southern gate and liaison between northern and southern parts of the Nile Valley and concurrently between Egypt and Africa.

The governorate's total area is 62726 km<sup>2</sup>, forming 6.2% of the country's total area. It is divided into 5 Markaz, 10 cities, and 37 rural local units with 90 affiliated villages.

Agriculture is the main activity in the governorate, which is famous for growing sugar-cane, hibiscus, wheat, dates and henna. The governorate contributes as well to industry, most importantly: sugar, chemical fertilizers, phosphate, and fish processing and packing. The industrial zone in El Shalal had been completed including installation of water, and electricity supply, as well as modern roads networks. Accordingly, many job opportunities were created for the people of the governorate

### 4.3 Basic Demographic Characteristics

The ESIAF paid attention to describe the main characteristic of the project areas. However, due to the wide geographical scope of the NG project, the ESIAF report will shed light briefly on the project sites characteristics. Additional detailed information is presented in the Supplementary Social Impact Assessment Framework report developed as a stand-alone document related to the NG project. Yet, it will be essential to collect more site oriented data during the preparation of the specific ESIA.

#### 4.3.1 Population Characteristics

The total number of the targeted NG project installation is 1.1 million household connections. That will serve around 4,564,105 beneficiaries.<sup>4</sup> The population of the 11 governorates is 39.794.78 million people. The highest proportion of people (17.6%) inhabits Giza Governorate. The least strata of people (1.0%) inhabit Matrouh Governorate.

The average household size reaches 5.33 person in Matrouh Governorate. However, the household size is only 3.83 person in Alexandria Governorate. The urban governorates are characterized of low household size. The average household size was the basis of estimated population to be benefited from the project.

#### Age Structure

The age categories of the population in the 11 Governorates showed a dominant growing young community as 50 % of the governorates' population falls under the age category 15- less than 45 years. Those who are less than 15 years old represent about 17.71% of the population. While those aged between 45- less than 60 years old represent about 14.39%.

#### Rate of Natural Increase

The crude birth rate varies between 28 live birth per thousand person in Qalubia Governorate to 46.2 birth in Matrouh Governorate. The mortality rate diversifies between 4.9 in Matrouh

---

<sup>4</sup> The number of beneficiary household in each governorate was multiplied by the average household within the governorate



Governorate and 7.9 in Alexandria Governorate, consequently, the population increase rate varies between 22.3 per thousand person in Daqahlia Governorate to 41.3 person in Matrouh Governorate.

### 4.3.2 Living Conditions

The study team tried to investigate the living conditions in order to obtain clearer view about the household characteristics of the potential beneficiaries. However, more localized socioeconomic investigations should be carried out during the site specific ESIA.

#### Household Size

The average family size of the sample surveyed in the 11 governorates is about 4.61 persons. However, the dominant value is 4 persons per household. The segregation of sample by the size of household reflected that 64.2% of the sample surveyed constitute of 4-6 persons, while a quarter of the sample surveyed are less than three persons. Slight variation was reported among the governorates as 21.3% of Sohag households reported an average of 7-9 persons, whereas, Daqahlia and Gharbeia household size did not exceed 6 persons.

#### Dwelling characteristics

The type of dwelling should be highlighted in order to identify the probability to install the NG to those houses. Around two thirds of the sample surveyed live in an apartment, while 31.7% live in a separate house. The governorates varied among each other regarding the type of dwelling. Around 92.0% of the sample surveyed in Qalubia live in an apartment, while 52.9% of the sample in Sohag live in a separate house. Due to the nature of dwelling, it is anticipated that the apartment buildings beneficiaries will benefit from the project, as well as those who live in a separate house.

The construction materials of the walls and ceilings are one of the main bases and conditions required to install the NG. It was reported that 42.4% of the total sample surveyed live in housing projects type. Around third of sample surveyed live in newly constructed house. 12.% live in old buildings and the same percentage live in squatter building. The diversity among the sample from the 11 governorate was obvious.

Almost all of the sample surveyed live in buildings constructed of concrete and red bricks. Few percentage of the buildings are constructed of white bricks. Dwellings constructed of wood and mud were limited. Indicating that, the houses are suitable for the installation of the NG.

Regarding the legality of the houses, the group discussions reflected that few percentage of the houses are constructed with no legal documents. Thus, they are not entitled for NG installation. The research team reported back observations from the field indicting that the government authority began to demolish the illegal constructed houses.

Regarding street conditions, the majority of them varies between 3-20 meters width. That was an indication of the high probability to get the NG installed in. As for ceiling construction materials<sup>5</sup>, almost 90.0% of the sample surveyed have a ceiling constructed of concrete. About 10.0% of the sample in Menufia governorate have ceiling constructed of wood, while few percentage of the sample in Sohag have ceilings constructed of palm tree reeds.

---

<sup>5</sup> The ceiling materials is one of the modalities required to install the NG



### 4.3.3 Access to Basic Services

#### Access to Electricity

Access to electricity in Egypt is high at (99.0%) (EHDR 2010). That is primarily due to the care given to improve living conditions for people in Egypt in particular access to electricity. Even squatter areas have access to electricity regardless of their formality and legality. That indicates to the stability of infrastructure in most of areas.

The census showed that the majority of households use electricity as the main source of light represents 99.0% of the population in all Governorate. However, the continuity of electricity current is not satisfactory to the residents of rural areas.

The governorates depend almost entirely on Nile water for all its water needs. Accessibility to potable water is high in the 11 governorates. Access to potable water is about 99.0% in urban areas, while it reaches 96.0% in Upper Egypt governorates. In Sohag, the majority of households have governmental water that was extracted from wells not from the Nile.

The quality of water supplies is still not satisfactory for the majority of community people. The color of water, taste and smell reflect the bad condition of water supply.

Human development report 2010 presented limited information about access to sewage systems which is one of the requirements to install the NG. The coverage of sewage in urban governorates (Alexandria ) is about 96.8%. While the coverage of Lower Egypt (Delta Region Governorates ) is around 64.6%. The coverage of urban areas is about 93.0% while it reaches only 52.6% of rural areas in Lower Egypt. The sanitation coverage in Upper Egypt is limited. 37.2% of the Upper Egypt areas are covered with sewage . 76.5% of the urban areas are covered by sewage while 13.5% of the rural areas only are covered with sanitation. Borders governorate (Matrouh) have limited access to sewage systems. About 42.8% of the borders governorates are served by sewage.

The sample surveyed reflected the high connectivity to sewage network. However, 14.1% of the sample reported that they have no access to sewage system.

### 4.3.4 Human Development Profile

Egypt's Human Development Report (2010) ranked the governorates according to their human development index scores. Tracking the level of Human Development achieved in different governorates since 2005, five governorates occupied the first five rankings in HD level, namely Port Said, Suez, Cairo, Alexandria and Damietta, while the governorates that occupied the bottom five ranks are Fayoum, Assiut, Menia, Beni Sue and Sohag. EHDR 2010 records changes in the ranking of governorates. Sohag and Qena governorates were ranked as the lowest ones, followed by Aswan and Qalubia. However, Alexandria and Ismailia were classified as of better human development conditions. Unfortunately, Matrouh was not classified.

Ismailia has entered the top five governorates for the first time since 1995. Whereas Qena has joined the bottom group. Ismailia has a rise of 0.025 in its human development index in EHDR 2010 compared to EHDR 2008.).

#### Education

Education is perceived as the first shell that can help population to withstand poverty. The review of secondary data showed that the intermediate education is prevailed among all



governorates. However, basic education (primary and secondary) was the prevailed type of education in Matrouh governorate (24.4%). Aswan governorate has more strata of intermediate education (31.5%). Illiteracy in Sohag governorate was relatively higher as (36.5%) of the population were classified among illiterate group. University education proportion was high in Alexandria and Giza Governorate. Educational status influenced the mentioned above human development index.

### **Unemployment and Work Status**

Unemployment rate for poor youth is lower than the non- poor, at any age. Poor young people cannot afford to stay unemployed. Thus, the incidence of unemployment may be low, although youth are still in poverty. Unemployment rates continue to be high for secondary and university graduates, especially for the poor. It seems that even if a poor person is able to break the vicious circle of education and poverty, he/she still cannot compete in the job market as a result of low quality education, labor market mismatch, or because of a lack of connections in identifying job opportunities.

The total labor force is relatively high in Menufia (38.0%), Alexandria (35.5%) and Gharbeia governorates (34.4%), while the lowest labor force reported was in Sohag (26.0%) and Qena (28.5%). Regardless of the level of education, it was obvious that the unemployment rate is higher among vocational school and university graduates. For example, in Alexandria the unemployment status was up to 51.0% among vocational; secondary school graduates, while it was only (13.5%) among below secondary education groups. Indicating that, vocational and university graduates are not qualified enough to get into the labor market. The unemployment rate varies among the governorates. Generally speaking, unemployment is higher in urban areas than in rural areas. Agricultural activities always absorb more working groups regardless to their educational level. Thus, the rural areas are of less unemployment rate.

With regards to the human activities in the 11 governorates, the Egyptian Human Development report provided detailed information about the labor force. The highest labor force among age category 15+ years was reported in Menufia Governorate (35.1%), whereas it was the lowest in Qena (26.9%). The percentage of women in labor force is the lowest in Giza governorate (14.4%) However, it was the highest in Menufia governorate.

Regarding to the segregation of working population by human activities, it was obvious that services are the most dominant human activity in most of the 11 governorates. It was higher in Matrouh governorate (74.0%), Alexandria (63.3%) and Giza (56%). However, industrial activities were higher in Alexandria (33.7%) and the lowest in Sohag governorate (14.8%). Agricultural activities were more dominant in Qena (42.3%) However, it was the lowest in Alexandria governorate (3.0%). That was anticipated as Alexandria is one of the urban areas.

#### **4.3.5 Poverty index**

Sohag and Qena are of poorer conditions than the other governorates. The GDP per capita in Qena is 6387.3 EGP, while in Sohag is 7329.7 EGP. The lowest 40.0% of people represented 25.8% in the two governorates. Poor persons represent (47.5%) of the total people in Sohag. The ultra-poor represents (18.5%) of the poor people in Sohag. Detailed discussion of poverty index is reported in the Sector Wide Social Assessment .

#### **4.3.6 Income and expenditure**

NG installation project necessitates a clear determination of poverty through analyzing the



income and expenditure of household. Reliability of expenditure data is higher than income. People are more willing to talk about expenditure rather than income. Thus, the study focused on the breadwinner who supports family financially, the expenditure and income of households.

Regarding the occupation of breadwinner, a big proportion of the sample surveyed (33.9%) work as services and sales person. However, 18.1% of the total sample work as skilled laborers. (16.2%) of the total sample work as administrative staff, as well as, (11.2%) work as specialists.

Gaining information about the income of the potential beneficiaries shed light on the potential affordability to pay for the NG connections, either in cash or by installment. Thus, the ESIAF collected data about the monthly income and expenditure. Following is the analysis of the income and expenditure among the sample surveyed.

The results of the primary data collected during the ESIAF related to the monthly income revealed that (25.9%) of the total sample surveyed earn between 1000-1500 EGP per month. While those who earn less than 1000 EGP are about fifth of the sample. About a quarter of the sample surveyed earn more than 2000 EGP. As it was anticipated, variations among governorates are obvious. The proportion of those earn less than 1500 EGP per month among the surveyed sample in Sohag is the highest representing about (80.0%). However, those earn more than 1500 EGP per month in Matrouh is about (84.0%) of the population.

Expenditure analysis results were to some extent consistent with the income distribution among the sample surveyed. About (25.0%) of the total sample surveyed spend between 1000- less than 1500 EGP. While Those who spend less than 1000 EGP represent about (22.0%). Variations in the 11 governorates were clear as the majority of Sohag sample spend less than 1000 EGP. However, it was obvious that the expenditure is relatively higher than the income.

Stability of income is one of the factors that might play for the benefit of the project as paying by installment is one of the payment option. About (20.0%) of the total sample surveyed reported their income decreased during the previous year. However, about third of the sample surveyed reported increasing in their income. The increase in income was justified by the sample. In Matrouh Governorate, they justified the increase of income due to the political situation that drove more people to visit Matrouh rather than Alexandria. Stability in income will enable people to pay by installment. However, such information might lead us to predict that people will not be able to pay big amounts of money. Thus, long term installments might be considered.

#### **4.3.7 Fuel currently used in households**

Secondary information provided by Butagasco (company filling and distributing LPG cylinders) reported that the LPG stores in the project areas vary according to the total population of the area. Qalubia governorate hosts 31 stores, while Matrouh and Aswan host only 4 stores.

The sample surveyed reported that the main type of fuel used for cooking is the LPG cylinders. The source of aforementioned type is mainly the LPG informal distributors (55.3%). The second source is the LPG cylinder store (31.8%). The distribution system suffers due to the chaotic distribution mechanism. Many groups try participating in the distribution activities. The formal legal ones are those groups working in the LPG distributor stores affiliated to Butagasco and those who received loan from the Social Fund for Development. However, the informal group is the vendors, grocers, house guards and NGOs. The Local Governmental Unit participates only during the shortage of LPG (mainly winter time in all governorates and summer time in Matrouh). It is worth noting that the LPG fuel is used also for baking in house backing



ovens that can't be operated by the NG. That was one of the main concerns raised by the community during the consultation activities.

During the course of LPG cylinders shortage, the informal LPG distributors earn about 50 EGP per day (working for 10 days a month). Nevertheless, they earn around 70 EGP per day on average all over the year. Those who receive loan from the SFD in Qena governorate earn between 100 EGP per day during the peak time. They might earn more all over the year. The governmental LPG distributors (formal groups) who work in the LPG store get about 2-3 EGP per each LPG cylinder as so called *tips*. Poor people are obliged to pay for them.

With regards to the fuel used for water heating, it is mainly electricity that operates electric water heating. However, in Sohag governorate the LPG was the main type of fuel. Kerosene was not of the same importance as electricity and LPG. (52.3%) of the sample surveyed in Sohag governorate and (55.3%) of the sample in Menufia reported that they use the LPG fuel for water heating. It was anticipated that the rural areas might have used alternative types of fuel, however, this was not the case. Remote areas in Matrouh city use dry wood for heating and baking. Particularly during the absence of LPG cylinders.

#### 4.3.8 Problems faced with the current household fuel

The data collection process took place during the shortage of LPG cylinders. That shed light on the problems the community members face to get the LPG cylinders. With regards to the current type of fuel used for cooking, (62.5%) of the sample surveyed reported the LPG cylinders are not easy to be obtained. The greedy LPG distributors raise the price of LPG informally. (37.7%) of the sample complained due to the high price of the LPG cylinder. Almost fifth of the sample surveyed complained about the long queues they have to stand in to get an LPG cylinder. (21.4%) of the sample surveyed reported that they suffer due to the high cost of electricity bill. It is worth mentioning that the electricity problems is less than the LPG. (55.6%) of those who have electric water heating reported that they face no problem with the electricity.

#### 4.3.9 Perception towards the project

Throughout the various consultation and engagement activities, the work teams experienced and recorded remarkable and overwhelming public acceptance, even eagerness, by the community and the governmental stakeholders towards the proposed project. The indignity and financial hardships experienced by scores of Egyptian families (especially women) in obtaining LPG cylinders (the current household fuel) was revealed through testimonies all over the country. Aside from a limited number of concerns regarding street rehabilitation after construction works and options of installation fee payment; the glaring message from governmental and community consultations was to commence implementation ASAP (with repeated requests to expand coverage beyond what is planned for the project).

Community perceptions were investigated in order to gain better understanding for the hosting communities' attitudes towards the project. It is very obvious that over 97% of the sample have positive perception about NG. 52.9% of the sample surveyed reported that NG is available all the time while 43.9% shed a light on the agony they face to get the LPG through long queues they have to stand in for hours. ***"I had to skip my school today to go to the LPG storeroom in order to get one... that was in vain... Should I skip school again tomorrow?"*** reported a young student in Sohag Governorate. The women had to carry their children to go to the LPG storeroom. Other respondents reported that the LPG does not have a fixed and unified price,



pointing out that the storeroom sells LPG cylinders for 8 EGP, while mobile distributors sell them for about 15-25 EGP. During winter in most of the governorates the LPG cylinders might be exchanged for up to 50 EGP.

#### **4.3.10 Willingness to pay**

The majority of sample surveyed expressed their willingness to be connected to the NG regardless to the amount of money they can afford to pay. Such attitude was attributed to the shortage of LPG cylinder during the data collection process.

The methods of payments discussed revealed that only third of the sample surveyed are willing to pay in cash. That proportion increased to 45.9% in Gharbeia governorate. The disparities among the 11 governorates was obvious. However, the survey team discussed with the whole samples all options of payments in order to get more detailed information about the exact willingness and affordability to pay among the sample.

The households surveyed reported that the least they can pay on average for the total installation about 800 EGP in cash. Concerning the highest value they can pay on average was about 1500 EGP. The majority of them reported 1500 EGP due to their information about the actual NG installation cost.

With regards to paying in installments, the average of the least advance payment is about 200 EGP, while the highest advance payment reported was 500 EGP. Both male and female headed families were willing to pay less than 500 EGP as advance payment. Such amount of money increased to reach less than 1000 EGP

Monthly installment value was investigated among the whole sample. The least average of installment they afford paying monthly is 39.59 EGP. However, the highest value they can pay as an installment per month is about 71.62 EGP. The discussion of paying by installment led us to the patterns of installments proposed by EGAS. (33.6%) of the sample surveyed reported that they can pay 28 EGP for 84 months





## 5 Environmental and Social Impacts

### 5.1 Introduction

The environmental and social advantages of switching household fuel from LPG cylinders to natural gas pipelines are quite diverse. On the residential level, the proposed project provides improved safety, reduced physical/social/financial hardships, and secure supply. On the national level, it promotes the utilization of Egyptian natural resources and reduces the subsidy and import burden. Even on the global level, the project involves cleaner fuel with reduced carbon footprint.

A thorough analysis of environmental and social impacts is important to detail an effective management and monitoring plan which will minimize negative impacts and maximize positives.

### 5.2 Positive Impacts

#### 5.2.1 During the construction phase

##### **Provide direct job opportunities to skilled and semi-skilled laborers**

- The total number of new long-term job opportunities is estimated at 6,000 jobs
- Up to 2,400 semi-skilled workers on a temporary basis
- Up to 570 local construction workers for water heater vent installations
- Up to 10,000 daily wage workers for street drilling

##### **Create indirect opportunities**

- The training center is needed to train young people from community.
- The LPG cylinder traders will benefit from purchasing the unused LPG cylinders
- Increased economic activity in project (food products, water and construction materials)
- During construction, workers and engineers may need accommodation
- National pipes and scaffold factories will be flourished
- Drivers and mini-bus owners will benefit from the transportation of the workers.

#### 5.2.2 During the operation phase

- Constantly available and reliable fuel for home use
- Reduced expenditure on LPG importation and subsidies (1273.8 million EGP savings)
- Significantly lower leakage and fire risk compared to LPG
- Improved safety due to low pressure (20 mBar) compared to cylinders
- Customer service and emergency response by qualified personnel/technicians
- Eliminate LPG hardships to the physically challenged, women, and the elderly
- Elimination of insects and dirt typically associated with LPG cylinders
- Limiting the LPG cylinder “black market” due to lower demand
- Limiting possible child labor in LPG cylinder distribution
- Hiring of up to 600 fee collectors in the 11 governorates

Detailed discussion of the potential positive socioeconomic impacts is presented in the Supplementary Social Impact Assessment Framework (SSIAF).



### 5.3 Potential Negative Impacts during Construction

In addition to international guidelines and best-practice which outline typical negative impacts which may potentially arise from such a gas connections project, monitoring reports from the Greater Cairo gas connections project and the analysis of ESIAF consultant identify the following aspects as key areas of possible concern:

- Traffic congestion and loss of access due to excavation and installation works
- Air emissions from heavy machinery and generators; dust from excavation activities
- Noise levels from heavy machinery and asphalt breaking; as well as other construction/demolition for extending NG piping into households
- Risk of damage/breakage of underground utility lines and piping (drinking water, wastewater, electricity cables, telephone lines) during excavations
- Possible disruption or displacement of ecological systems (especially in excavation and installation of the 70-bar steel pipelines)
- Potential risk to weak structures may arise in areas where building standards are not followed or in areas where high groundwater levels affect integrity of foundations
- Structural and aesthetic effects on culturally-valuable sites and antiquities
- Management of solid, liquid, and hazardous waste from handling and temporary storage to transportation and final disposal
- (رد الشيء لأصله) could be translated as “rehabilitation” or “restoration”. In the context of the proposed project, it is applied to the responsibility of the implementing company (Town Gas or Egypt Gas) detailed in the terms agreed with the local governmental units to provide the necessary resources to re-pave roads and streets to the original state after natural gas excavation and installation works.
- **Socioeconomic impacts**
  - 1- **Impacts on assets (land) and livelihoods of the farmers (crops)**
  - 2- **Due to the fact that the installation should be based on certain technical and safety specifications, some of the areas and houses will not be accepted to be connected to the NG. Because the project is widely needed and a demand driven project, that might raise some sensitivities and negative reactions from the community members who will not be served.**
  - 3- The main concern reported by the majority of respondents from the community is **the negative implications resulting from damaging the streets in both paved and unpaved roads. This** could be in the form of local communities inconvenience and disturbance.
  - 4- There is a risk that negligent workers may cause accidents harmful to themselves or to the community members, particularly children, especially close to the digging sites.
  - 5- Concerning workers, they should be trained on the occupational health and safety measures and they should be strictly monitored.



### 5.3.1 Reduction of Traffic Flow (*disruption of local and regional traffic*)

Traffic in almost all Egyptian cities may be adversely affected by such congestions. Coordinating with and obtaining approvals from local government and traffic police is vital to avoid delays and objections to the work program.

Access to buildings and shop entrances may be limited or constricted in cases where excavations form obstacles for persons and cargo.

Traffic and access limitation effects are temporary, local, and range from low to high severity.

### 5.3.2 Air Emissions

Air emissions (gases and particulates) during construction shall arise from:

- Particulate matter and suspended solids from excavation/backfilling operations
- Possible dispersion from stockpiles of waste or sand used for filling trenches.
- Exhaust from excavation equipment and heavy machinery (excavators, trenchers, loaders, trucks) containing SO<sub>x</sub>, NO<sub>x</sub>, CO, VOCs, etc.

An indirect potential source of air emissions is traffic congestions resulting from excavation works.

Soil stockpiling is usually minimal at the site, and is normally backfilled within the same day.

Air emissions impacts are expected to be temporary, local, and of low severity.

### 5.3.3 Noise

Construction activities will likely increase noise levels due to excavation and heavy machinery. Typical construction noise includes noise intensity due to engine operation, and intermittent impacts which may take place during demolition of asphalt, either by a trencher or by a jack hammer.

Noise impacts on construction workers, technicians and engineers in direct vicinity of the excavation works and heavy machinery are considered more significant than those on residents, because they are exposed to high levels of noise for relatively longer periods. Residents are considered secondary receptors of elevated noise levels, as the noise intensity will be relatively attenuated at their locations. Traffic congestions, which could be caused by excavation works, may increase ambient average noise intensity levels.

Noise impacts are expected to be temporary, local, and of low to medium severity.

### 5.3.4 Risk on Infrastructure and underground utilities

In many locations across Egypt, underground utilities and infrastructure pipelines (such as water, sewerage and telecommunication) have been installed years ago without accurate documentation and maps for its routes and depths. Therefore, the risk of damage to such utilities during excavations for Natural gas pipeline installation is considerable.

Impacts on underground utilities are expected to be temporary, local, but of medium severity.



### 5.3.5 Possible effects on structures

Excavation for natural gas pipelines is usually shallow and does not exceed 1.0 meter depth. If groundwater was not encountered during excavation of normal trenches there will be no effects.

Weak and old structures are quite sensitive to differential settlements, which may be caused by dewatering.

Another possible impact on structurally-vulnerable buildings is weakening the structural system during drilling holes in the walls for riser connections on the side of the building or for internal connections to the household.

Structural impacts on vulnerable buildings may be permanent and highly severe.

### 5.3.6 Effect on Culturally Valuable Sites

Egypt contains some of the world's oldest and most valuable antiquities and monuments. Effects on culturally valuable sites (antiquities, monuments, architectural heritage) may involve:

1. Structural damage to a monument due to dewatering during excavation.
2. impacts on monument's foundations due to excavation works.
3. Damage to the monument body by vibration of machinery.
4. Reducing the aesthetic appeal of the site or building.
5. Improper management of discovered antiquities during excavation (chance finds).

Chance finds during excavation are highly unlikely within the cities as the streets have been previously excavated for installing underground utilities. However, it may occur during the excavations for the steel HP mains which may traverse uninhabited areas. The likelihood of chance finds may be higher in the Upper Egypt governorates where numerous finds have been reported. The Antiquities Law provides clear guidelines for action in the case of chance finds. It also states that a representative of the antiquities department must be present during excavations in areas adjacent to antiquities sites.

Impacts on culturally valuable sites and buildings may be permanent and highly severe.

### 5.3.7 Effect on ecological systems

Excavations and pipe laying will take place for both the HP steel lines and the PE distribution lines. The distribution lines will mostly be aligned along routes previously excavated or paved. However, HP steel lines may be aligned under ecological systems requiring reinstatement and/or offsetting during excavation

No official protected areas will be encountered in the alignment of any of the lines, HP or PE.

Impacts on ecological systems are expected to be temporary and low in severity.

### 5.3.8 Solid and Liquid Waste Disposal

Wastes that are generated during the construction phase include:

- Excavated soil and excess sand;
- Concrete and bricks waste;
- Broken asphalt;



- Containers of chemicals and lubricant oils used for construction machinery;
- Possibly damaged asbestos water pipes during excavation; and
- Dewatered product from trenches.

Overall, waste management impacts are temporary but may range from low to high severity

### 5.3.9 (رد الشيء لأصله) Restoration

As explained above, the literal translation of “رد الشيء لأصله” is “restoration to original state”. The implementing entity (Egypt Gas and Town Gas) is legally responsible for restoring the streets to their original state after completion of excavation and installation works.

The current arrangement is that the implementing entity performs the backfilling of the excavated trenches and agrees a restoration fee with the local government unit (district) to cover the balance of the restoration and pavement cost. The local unit uses the fee to include the restoration and re-pavement of the streets in its “pavements plan”. In many cases, the pavement plan is several months away and the streets remain unpaved, causing nuisances and potential damage to vehicles. Another source of delay is that the local unit sometimes do not possess the equipment and materials required for re-pavement. In that case, the local unit commissions the regional “Roads and Bridges directorate” to perform the restoration. This may lead to further delays in re-pavement and prolongs impacts on the public and vehicles.

Although the restoration impact may be temporary, localized, and of low severity, it is perceived by the public as major inconvenience.

### 5.3.10 Potential Impacts of PRS Construction

The negative impacts or risks associated with PRSs construction are related to handling of construction waste, noise and air pollution from construction machinery which have all been discussed earlier.

## 5.4 Potential Negative Impacts during Operation

### 5.4.1 User health and safety

In addition to a full array of safety and emergency precautions taken by EGAS and the implementing entities, user safety is prioritized by stating emergency precautions on the household gas meter and by setting up emergency response centers.

Impacts on user health and safety may occur through improper handling of piping and valves by the user. This may be due to a lack of awareness, illiteracy, or failures in piping or sealants.

User safety impacts could be permanent and highly severe.

### 5.4.2 Improper handling of the Odorant

The odorant containing Tertiobutylmercaptin (80%) and Methylehysulphide (20%) is classified as a hazardous substance. The MSDS of the odorant identifies the following hazardous properties: Highly flammable, flammable and toxic products upon thermal decomposition, irritant, and toxic to aquatic flora and fauna.

It will also be required to keep a register for management practices followed in PRSs.



Improper handling of the odorant includes:

- Storage in unsafe conditions, in terms of occupational health and safety.
- Leakage to the environment as:
  - Discharge of remaining odorants in containers, after use, in land or sewers;
  - Disposal of used containers with domestic waste, or by open disposal; and
  - Recycling of used containers for other materials.

Impacts of improper odorant handling may be permanent and highly severe.

### 5.4.3 Noise of PRS

The pressure reducers normally cause noise generated from the reducers' pipes. The generated noise is constant (not intermittent). Assuming ambient noise levels are complying with Law 4/1994-9/2009 standards for low noise residential areas, a 20-meter buffer distance kept between the reducers and the PRS fences should lead to minimal impact outside the PRS borders.

Impacts of PRS noise may be permanent and severe.

### 5.4.4 Safety Aspects of PRS Operation

The safety risks associated with PRSs' operation (leakage, fire hazard, explosion, suffocation) should be assessed for the workers and the public at large, using Quantitative Risk Assessment (QRA) modeling and comparing the results with international risk management guidelines as a reference (As performed for Greater Cairo connections project). The conclusion of the Greater Cairo QRAs for the PRS is that the risk is within the acceptable limits, if safety precautions have been considered and strictly followed in the design, operation and maintenance of such facilities.

Impacts of PRS safety may be permanent and may vary from low to highly severe.

### 5.4.5 Integrity of the pipelines

Low-probability events may impact the integrity and safety of the NG network and components during the years of the operation phase.

- Geological and geotechnical events: earthquakes may result in geotechnical instabilities that lead to network breakage or leakage in multiple locations simultaneously. The geological and geotechnical history of the area may also lead to possible events. Some of the project areas were previously swamp areas which have been dried up and backfilled. Such areas are prone to settlements and instabilities due to dewatering
- Sabotage: pipelines and other components may be targeted for sabotage.

Despite the low probability of both scenarios, impacts may be permanent and highly severe.

### 5.4.6 Potential negative Socioeconomic impacts during operation

The analysis of social impacts of any project lies at the core of assessing the relevance of the project based on its benefits versus its drawbacks to communities including the hosting community. In case the potential project's estimated positive impacts on the community outweigh the negative impacts, then the project is likely to be beneficial in terms of social outcome. The discussion of positive impacts is presented in details within the Supplementary



Social Impact Assessment. As a summary of discussion:

- 1- Under certain technical and safety conditions it is not possible to avoid visually impacting the entrance of the apartment and dwellings with installed pipes.
- 2- For those who will pay in installments, this may be an added financial burden on the poor families or those who do not have secured source of income
- 3- Minor impact on LPG cylinders distributors. (Governmental sector- private sector who have license to distribute LPG cylinders- non official distributors). There could be a negative economic impact on the LPG cylinders distributors. . However, this is unlikely to happen because of their high mobility which allow them to go to other areas which are not connected to NG within the neighborhood. Even within the areas that will be connected, demand on LPG will be reduced but will not vanish fully because houses which are not technically compatible, houses with baladi ovens, shops...etc. will still maintain the need for LPG. The survey showed that 6 LPG cylinder distributors are taking loans from SFD for their small business in Qena Governorate. During the implementation of Greater Cairo project, EGAs used to address SFD to obtain records in order to ensure that beneficiaries of loans for the same purpose are repaying back the loans and are not interrupted. This has been done as a measure from EGAS side to ensure that no negative impacts are affecting this group. EGAS is intending to follow the same measure.
- 4- Safety hazard resulting from the possibility of Leakage. Although of limited probability, such impact should be mitigated through preparing awareness raising campaigns and clear information dissemination system



## 6 Analysis of Alternatives

### 6.1 No Project Alternative

The Natural Gas Connections Project to 1.1 Million Households in 11 governorates is part of the plan developed by the Ministry of Petroleum to connect 2.5 Million households over the next 3-6 years. This plan is expected to yield many economic and social benefits in terms of providing a more stable, energy source, achieve savings in LPG consumption and enhance safety in utilizing energy.

The No-Project alternative is not favored as it simply deprives the Egyptian Public and Government of the social, economic, and environmental advantages detailed in positive impacts during operation sections of this report.

- Constantly available and reliable fuel for home use
- Reduced expenditure on LPG importation and subsidies
- Significantly lower leakage and fire risk compared to LPG
- Improved safety due to low pressure (20 mBar) compared to cylinders
- Customer service and emergency response by qualified personnel/technicians
- Eliminate LPG hardships to the physically challenged, women, and the elderly
- Elimination of insects and dirt typically associated with LPG cylinders
- Limiting the LPG cylinder “black market” due to lower demand
- Limiting possible child labor in LPG cylinder distribution

### 6.2 Energy Alternatives

Three alternative energy sources could be considered as alternatives for supplying stable reliable and low cost energy to 1.1 Million Households: (a) expand LPG usage, or (b) convert to electricity, or (c) use renewable energy sources:

- **LPG:** The majority of LPG in Egypt is imported and subsidized by the Government to ensure that it is affordable by the lower income groups. Introduction of piped natural gas to replace LPG will help to remove those subsidies and reduce imports. The proposed project is also expected to produce very positive improvements in the safety of gas utilization. In the natural gas industry in Egypt, appliance standards, fittings and conversions are strictly controlled and only trained and qualified personnel carry out installations and respond to emergencies. In the case of LPG, this does not apply so the conversion of existing LPG appliances helps to eliminate existing unsafe installations and unsafe use of LPG.
- **Electricity:** The second possible alternative is to convert all homes to use electricity for all energy supply applications. Whilst electricity is more efficient at the point of use, there are considerable inefficiencies in power generation from fossil fuels with about 50% efficiency if combined cycle plants are available. Additional power stations would be needed to cope with the additional demand created by utilization of electricity in homes, which most probably would operate also by natural gas. Power losses in transmission and distribution are also significantly higher than their natural gas equivalents which would add to the overall inefficiency.
- **Renewables:** it is immensely important to expand the utilization of renewables in Egypt. Renewables are needed to diversify the energy basket, reduce pollution and GHG





emissions, and to serve remote/off-grid locations. However, the renewables market does not present feasible, practical, and affordable alternatives to connecting 1.1 Million households at this point in time. Biogas requires large amounts of agricultural and domestic waste, while solar panels and heaters remain in pilot phase. Numerous ongoing efforts aim to promote such renewable energy sources. However, they seem to be facing technoeconomic and institutional barriers to mainstreaming at this stage.

Energy alternatives do not provide favorable options to the proposed NG networking

### 6.3 Piping material Alternatives

With regards to the materials the piping inside the households, international standards state that either copper or steel may be used. Several considerations support the use of steel piping in Egypt. These include strength, cost, and some aspects of public attitudes (copper is known in Egypt as an attractive target for theft due to its high value). Aside from the aspect of minimizing corrosion (and therefore risk of leakage), selection of one of the piping materials over the other does not seem to offer contrasts in the environmental and social impacts (except a marginally lower pressure loss with copper piping). Therefore, as long as precautions and safety margins are respected steel seems to be the more practical and safer choice.

### 6.4 Sequence of work progress (in various areas) Alternatives

As mentioned previously, two companies will be undertaking the household gas connection activities in the 11 governorates under the concessions of two distribution companies; **Town Gas** in the Giza, Ismailia, Alexandria, and Marsa Matrouh governorates, and **Egypt Gas** in Qalubia, Menufia, Daqahlia, Qena, Sohag, Gharbia, and Aswan governorates.

Progressing with constructing the transmission (HP) and distribution networks in the various project areas could be practiced through two alternatives:

- Alternative 1: Complete the construction of the networks in more than one area simultaneously.
- Alternative 2: Complete networks in sequence area by area.

Advantages of Alternative 1 over Alternative 2 are:

- Shorter implementation schedule
- Utilization of economies of scale in lower cost for the additional equipment and components procured to cover multiple areas simultaneously

Advantages of Alternative 2 over Alternative 1 are:

- Less resources and capital investments required
- Less management and coordination resources required

Overall, the key contrast between the two alternatives is related to CAPEX and OPEX of the available assets and human resources. If sufficiently distant from each other, it may be favorable to expand the work progress over many areas ( within the available resources) while paying special attention to coordination of sequential work outputs of the parallel teams. The main advantage of working in parallel would be to minimize project implementation time.



The environmental benefits and negative impacts of the two alternatives are similar if the areas being implemented are distant from each other (in different governorates or areas with large distances between them. However, working in parallel in areas which are close to each other (such as districts) may lead to heavier environmental and social impacts (such as traffic congestions, as well as air and noise emissions).

## **6.5 Sequence of work progress (within area) Alternatives**

---

Construction of the gas network inside the city comprises two main components, the first is the distribution network in the longitudinal roads direction, and the second is the lateral connection network to the residential units perpendicular to the road direction.

Progressing from constructing the distribution network to constructing the connection network, this could be practiced through two alternatives:

- Alternative 1: Complete the construction of the distribution network and then start the connection network at a later stage.
- Alternative 2: Complete both networks simultaneously in one stage.

Advantages of Alternative 1 over Alternative 2 are:

- Technical problems during line testing could be avoided, as detecting leaks in the main pipe will be much easier if no connections are placed;
- Lower risks for re-excavating parts of the line including leaks; and
- Shorter traffic disturbance time for the first excavation stage because no lateral intersection with the traffic flow.

Advantages of Alternative 2 over Alternative 1 are:

- Amount of excavation/filling works are slightly less, because intersections between mains and connection trenches are excavated only once;
- Makes mobilization of equipment and areas of storage occupied only once; and
- Traffic disturbance occurs only once.

The environmental benefits and negative impacts of the two alternatives are close. The amount of excavations in the two alternatives are approximately equal, however, the second alternative has a clear advantage of causing disturbance only once for the same street, in addition to less air emissions and traffic disturbance caused during equipment mobilizations. Therefore, if all other technical or financial factors are equal then the second alternative may be slightly more advantageous from an environmental perspective. However, because phasing of connection works will depend mainly on developing contracts with new customers, no objections are foreseen in going along with Alternative 1.

## **6.6 Routing Alternatives**

---

Siting and routing alternatives are guided by technical, environmental, and social considerations. The foremost factor of selection is the safety of the installations and minimal explosion, leakage, or fire risks. International (British) standards are referred to upon project detailing. Feasibility studies and detailed Property & Appliance surveys assess and recommend connections to areas with adequate environmental conditions (conditions of buildings, and complete utilities networks) as well as to lower income/high population density areas.



## 6.7 Installation costs

---

The average natural gas connection installation cost is about 2,500 EGP<sup>6</sup> and consumers contribute a part of 1500 LE. This payment can be made either upfront or in installments over a period of time.

Typically, the households opt for flexible monthly payment plans facilitated by the LDCs and local banks. Limited number of NGOs also provided financial assistance for installing gas connections for households in very low income neighborhoods.

The government of Egypt does not provide additional subsidy to the poorer groups, However, they provide facilitation payments strategies through offering the following types of installments:

- 1- 138 EGP/Month for 12 months
- 2- 74 EGP/Month for 24 months
- 3- 52 EGP/Month for 36 months
- 4- 42 EGP/Month for 48 months
- 5- 35 EGP/Month for 60 months
- 6- 31 EGP/Month for 72 months
- 7- 28 EGP/Month for 84 months

---

<sup>6</sup>*Converting Households from LPG to Natural Gas- Social Impact Assessment Study- 2013*



## 7 Environmental and Social Management & Monitoring Framework

### 7.1 Objectives of the ESM&MF

The objective of this Environmental and Social Management and Monitoring Framework, is to outline a mechanism for minimizing or eliminating potential negative impacts and for monitoring the application and performance of mitigation measures. The ESMMF identifies roles and responsibilities for different stakeholders for implementation and monitoring of mitigations. This section also presents an assessment of the institutional capacity for implementing the ESMMF.

For the current study, the specific environmental and social impacts arising from the wide geographical, socioeconomic, physical, and developmental variations between the areas of the proposed project (11 governorates) will be addressed in the detailed site-specific ESIA's which will be prepared once final project detailing is complete upon WB loan approval.

At the available level of project details, the impact significance (summarized in the table below), is based on two main criteria:

- 1- Duration: of the possible outcome (in case it does take place) of the impact.
  - a. Temporary, Permanent
- 2- Severity: Difficulty of repair or remedy of the outcome (in case it does take place).
  - a. Low, Medium, High



Table 7-1: Summary of impacts significance

Activity	Potential Impact Significance (Duration, Difficulty to mitigate)									
	Traffic	Air quality	Noise	Underground utilities	Vulnerable structures	Cultural sites	Waste disposal	Ecological systems	Socioeconomic aspects	Health and safety
<b>Construction Phase</b>										
<b>Mobilization</b>	Temporary, low	N/A	Temporary, low	N/A	N/A	N/A	Temporary, low	Temporary, low	Temporary, medium	N/A
<b>Excavation</b>	Temporary, high	Temporary, medium	Temporary, high	Temporary, high	Permanent, high	Permanent, high	Temporary, high	Temporary, low	Temporary, medium	Temporary, low
<b>PE Pipe laying</b>	Temporary, low	Temporary, low	Temporary, low	N/A	N/A	N/A	Temporary, low	N/A	N/A	Temporary, low
<b>HP piping installation</b>	Temporary, low	Temporary, low	Temporary, low	N/A	N/A	N/A	Temporary, low	Temporary, low	N/A	Temporary, low
<b>PRS construction</b>	Temporary, medium	Temporary, medium	Temporary, high	N/A	N/A	N/A	Temporary, medium	N/A	Temporary, medium	Temporary, low
<b>Leakage testing</b>	Temporary, low	Temporary, low	Temporary, low	N/A	N/A	N/A	Temporary, low	N/A	N/A	Temporary, low
<b>Street restoration</b>	Temporary, high	Temporary, low	Temporary, high	N/A	N/A	N/A	Temporary, medium	N/A	Temporary, low	Temporary, low
<b>Connections</b>	Temporary, medium	Temporary, low	Temporary, high	N/A	Temporary, medium	N/A	Temporary, medium	N/A	Temporary, low	Temporary, low
<b>Conversions</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Temporary, medium	N/A
<b>Operation Phase</b>										
<b>PRS operation</b>	N/A	N/A	Permanent, low	N/A	N/A	N/A	Permanent, medium	N/A	Permanent, low	Permanent, high
<b>Network operation</b>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Permanent, low
<b>Repairs</b>	Temporary, medium	Temporary, medium	Temporary, medium	Temporary, high	Permanent, high	Permanent, high	Temporary, high	Temporary, low	Temporary, medium	Temporary, low



## 7.2 Management and Monitoring activities During Construction Phase

### 7.2.1 Management of Traffic

### 7.2.2 Management of Air Emissions

### 7.2.3 Management of Noise

### 7.2.4 Management of Excavation Activities Posing Risk on Utilities

### 7.2.5 Management of Activities Posing Risk on Structures Stability

### 7.2.6 Management of Culturally Valuable Sites

### 7.2.7 Management of Waste Disposal

### 7.2.8 (رد الشئ لأصله) Management of Street Restoration after asphalt breaking

### 7.2.9 Management of grievances (*Environmental and Social Grievance Redress Mechanisms*)

Establishing a grievance redress mechanism (GRM) is one of the most fundamental procedures that warrant smooth and amicable implementation for the project activities. The importance of having a local based GRM is to ensure that complaints are passing through appropriately announced channels and are handled properly and timely. A functioning GRM is considered to be a good feedback mechanism from the customer and one tool of the citizen engagement.

In order to propose practical procedures for the GRM, the Consultant started with analyzing the current grievance mechanism adopted by NG companies. The analysis of current procedures is summarized as follows:

**Table 7-2: Current grievance mechanism adopted in the NG companies**

Activities	Egypt Gas	Town Gas	EGAS
During the construction phase			
Tiers of grievances	First tier is applied on the level of Town Gas and Egypt Gas		Second tier on the level of EGAS
Communication channels	They receive the complaints through the following channels: 1- Hotline 129 2- Website and E- mail 3- Postal Mail 4- On site complaints		1- Mails 2- Visit EGAS



Activities	Egypt Gas	Town Gas	EGAS
Roles	<p>They receive the complaints as follows:</p> <p>1- In the construction site where the responsible person in the site tries to solve the problem immediately</p> <p>2- In case of not solving the problem, the complainant goes to the project manager who takes practical procedures to solve the problem</p> <p>In case of not solving the problem the complainant targets to the third level which is the Central Department</p>		<p>In case of not solving the problem on the first level of grievance the complainant raise his complaint to EGAS</p> <p>They contact the client for more details about his complaint</p> <p>They transfer the complaint to the implementing company in order to solve the problem. They follow up the complaint until satisfactory solution is attained</p>
Monitoring	<p>The Internal Monitoring Specialist (IMS) follow up the implementation of corrective procedures</p> <p>After solving the problem, the IMS finalizes the complaint and inform the complainant about the solutions adopted in order to measure his/her satisfaction with the solutions</p>		<p>They monitor the performance of Egypt Gas and Town Gas</p>
Documentation	<p>The person in charge of complaints receives and analyzes the complaints. S/he proposes some solutions and gets in contact with the implementing department in order to propose solutions for the complaints.</p> <p>The IMS document a summary of the complaint in a complaint log (CL)</p> <p>An analysis is conducted to identify the main triggers for complaints by the end of each year. Some recommendations are developed in order to enhance the performance of the companies</p> <p>The complaints are documented and kept in the company for three years</p>		<p>No records or documentation for all grievances</p>
Reporting	<p>Quarterly report is developed to EGAS</p>		<p>Quarterly progress report is developed to Funding Agency</p>



Activities	Egypt Gas	Town Gas	EGAS
During the operation phase			
<p>The above mentioned procedures are adopted with the addition of the ‘Customer Service Office’ in Egypt Gas and Town Gas. Its roles are as follows:</p> <ul style="list-style-type: none"> <li>Receive any complaints related to the NG installation during the operation phase.</li> <li>Provide information about the entity responsible for problem solution</li> </ul>			

The above mentioned mechanism managed to limit the number of complaints that required judicial intervention, raising only a limited number of cases to courts, which testifies to the functionality of the proposed mechanism. On the other hand, this mechanism lagged behind when it came to information dissemination to members of the community and providing feedback to the complainants.

Since the resettlement work will be carried out with the full participation of the PAP, it is expected that no major grievance issue will arise. However, to ensure that the PAP have avenues for redressing their grievance related to any aspect of land acquisition and resettlement, detailed procedures of redress of grievances have been established in this RPF. The objective is to respond to the complaints of the PAP speedily and in a transparent manner, without resorting to complicated formal channels to the extent possible.

The ESIAF has prepared detailed grievance mechanism that will be shared with the community beneficiaries. Leaflets, posters and brochures will be prepared and distributed to the beneficiaries, NGOs, local governmental units, mosques and churches. Thus, sufficient and appropriate information about the GRM will be shared with the communities prior to the construction phase. Following are the various stages of grievances

### **First stage of grievances**

In order to ensure high level of responsiveness to the local communities, it is essential to ensure that a local grievance mechanism is functioning and that communities are aware of it. Egypt GAS and Town Gas will assign a Social Development Officer (SDO)(can be more than one) who will be working closely with the assigned SDO of EGAS. It is the SDO responsibility to ensure that the GRM system is widely known and well explained on the local level.. Moreover, s/he will follow up on the complaint until a solution is reached. The turnaround time for the response/resolution should be 10 days and the complainant should know that he/she should receive response by then

The grievances should be presented to the following:

- The Foreman working on the ground,
- The project manager,
- The central department

It is worth noting that most of the previous experience of EGAS is suggesting that complaints are usually handled efficiently and resolved on the local level. In case the problem is not solved, the complainant may reach out to the second level of grievance.





### ***Second stage of grievances:***

If the aggrieved person is not satisfied with the decision of the SDOs of Town Gas or Egypt Gas at Stage 1, He can present the case to EGAS SDO where he should provide resolution within 15 days, Following is the second level of grievances:

1. The Social Development Officer in EGAS will handle technical, environmental and land acquisition complaints. He should receive the unsolved problems. Thereafter, he gets in contact with the petitioner for more information and forwards the complaint to the implementing entities for a solution.
2. The SDO should follow the complaints and document how they were solved within **15** days.
3. The SDO should update the complainant on the outcome of his/her complaint.

### **Grievance channels**

Due to the diversity of the context in different Governorates and the socioeconomic characteristics of the beneficiaries, the communication channels to receive grievances were locally tailored to address all petitioners concerns and complaints . The following are the main channels through which grievances will be received:

1. Foremen act as the main channel for complaints. They are always available in the street. However, complaints raised to him/her are mostly verbal. Thus, s/he should document all received grievances in writing form using a fixed serial number that the complainant should be informed about to be able to follow up on the complaint
2. Hotline
  - 129 is the hotline in Town Gas and Egypt Gas
3. Egypt Gas Website:
  - [www.egyptgas.com.eg](http://www.egyptgas.com.eg)
4. Trustworthy people, community leaders and NGOs/CDAs will be an appropriate channel, particularly, in rural areas and Bedouin communities.

### **Response to grievances**

Response to grievance will be through the following channels

1. The response to grievances should be through an official recognized form to ensure proper delivery to the complainant. It is the responsibility of the SDOs to ensure that complainants were informed about the results of handling their complaints.
2. Response to grievances should be handled in timely manner as mentioned above, thereby conveying a genuine interest in and understanding of the worries put forward by the community.
3. EGAS, Town Gas and Egypt Gas should maintain record of complaints and results.

### **Monitoring of grievances**

All grievances activities should be monitored in order to verify the process. The monitoring process should be implemented on the level of EGAS, Town Gas and Egypt Gas. The following indicators will be monitored:

1. Number of received grievances monthly (Channel, gender, age, basic economic status of the complainants should be mentioned)



2. Type of grievance received (according to the topic of the complaint)
3. Number of grievances solved
4. Number of unsolved grievances and the reasons behind not solving them
5. Satisfaction levels with proposed solutions
6. Documentation efficiency
7. Time consumed to solve the problem
8. Efficiency of response to received grievance
9. Dissemination activities undertaken

### **Institutional Responsibility for the Grievances**

The entity responsible for handling grievances, will mainly be the Environmental Affair Department within the implementing agency (EGAS). The Social Development Officer (SDO) working within EGAS in cooperation with the two NG companies will address all grievances raised by community members, particularly the ones related to resettlement activities. The main tasks related to grievances of the SDO are:

1. Raise awareness about channels and procedures of grievance redress mechanisms
2. Collect the grievances received through different communication channels
3. Document all received grievances
4. Transfer the grievance to the responsible entity
5. Follow up on how the problem was addressed and solved
6. Document, report and disseminate the outcome of received grievances
7. Ensure that each legitimate complaint and grievance is satisfactorily resolved by the responsible entity
8. Identify specific community leaders, organizations and citizen groups required to enhance the dialogue and communication through a public liaison office to avoid or limit friction and respond effectively to general concerns of the community
9. Monitoring grievance redress activities

All grievances received verbally or in written shall be documented in a grievance register. The stand-alone SSIAF illustrates the forms needed to document the grievances



### 7.3 Environmental Management Matrix during CONSTRUCTION

Table 7-3: Environmental Management Matrix during CONSTRUCTION

Impact	Mitigation measures	Responsibility of mitigation	Responsibility of direct supervision	Means of supervision	Estimated Cost of mitigation / supervision
Traffic congestion and diversion	Construction during off-peak periods  Traffic department to grant excavation license limited to specific hours	Implementation entities contracted by the local distribution companies : Town Gas/Egypt Gas (to be referred to as “Contractor” from this point forward)	Town Gas /Egypt Gas Health, Safety, and Environment (HSE) Department  Relevant Traffic Department	Contractor has valid conditional permit + Field supervision	Contractor management costs (included in bid price)  Town Gas/Egypt Gas management costs
	Announcements using local broadcasts  Signage indicating location/duration of works prior to commencement of work	Local administration  Contractor	Town/Egypt Gas (T/E Gas) HSE + Traffic Department	Ensure inclusion in contract + Field supervision	Contractor management costs (included in bid price)  LDC management costs
	Consider the feasibility of using the Horizontal Directional Drilling (HDD) technique under critical intersections to avoid heavy traffic delays (and associated noise/air emissions)	Contractor	T/E GAS HSE  Traffic department	Field supervision	Contractor management costs (included in bid price)  T/E GAS management costs
	Traffic detours and diversion	Traffic Department	Traffic Department	Ensure detouring efficiency	Additional budget not required
	Road restructuring and closing of lanes	Traffic Department	Traffic Department	Ensure adequate traffic flow	Additional budget not required



Impact	Mitigation measures	Responsibility of mitigation	Responsibility of direct supervision	Means of supervision	Estimated Cost of mitigation / supervision
Air emissions	Best practice in controlled wetting and compaction of excavations to minimize dust emission	Contractor	T/E GAS HSE	Contractual clauses + Field supervision	Contractor management costs (included in bid price) T/E GAS management costs
	Sound isolation, storage, transportation and disposal of stockpiles	Contractor	T/E GAS HSE	Contractual clauses + Field supervision	Contractor management costs (included in bid price) T/E GAS management costs
	Compliance to legal limits of air emissions from all relevant equipment	Contractor	T/E GAS HSE	Review manufacturer catalogues and exhaust certificate or request emission measurements	Contractor management costs (included in bid price) T/E GAS management costs
Noise	Ear muffs, ear plugs, certified noise PPE	Contractor	T/E GAS HSE	Contractual clauses + Field supervision	Contractor management costs (included in bid price) T/E GAS management costs
	Avoid noisy works at night whenever possible	Contractor	T/E GAS HSE	Field supervision	Contractor management costs (included in bid price) T/E GAS management costs
Damage to U/G utilities	Pre-planning and coordination with central, regional, and local departments of potable water, wastewater, electricity, and telecom authorities to obtain maps/ data on depth and alignment of underground utilities	Contractor	T/E GAS HSE	Official coordination proceedings signed by representatives of underground utility authorities Examination of site-specific reports and records Field supervision	Contractor management costs (included in bid price) T/E GAS management costs



Impact	Mitigation measures	Responsibility of mitigation	Responsibility of direct supervision	Means of supervision	Estimated Cost of mitigation / supervision
	Limited trial pits or boreholes to explore and identify underground utility lines  Non-intrusive Radio- cable and pipe locator to detect underground utilities	Contractor	T/E GAS HSE Supervisor	Contractual clauses + Field supervision	Contractor costs (included in bid price)  T/E GAS management costs
	Preparation and analysis of accidental damage reports	Contractor	T/E GAS HSE	Review periodic HSE reports	Contractor costs (included in bid price)  T/E GAS management costs
	Repair and rehabilitation of damaged components	Contractor	T/E GAS HSE  Local Government Unit  Local Police	Contractual clauses + Field supervision	Included in contractor cost but must be evaluated on a case-by-case basis
Effects on cultural sites	Identify areas of antiquities, monument repair zones	Contacto & Supreme Council for Antiquities and Local Council	T/E GAS HSE	Review permitting procedures and ensure review of Council	T/E GAS management costs
	Supervise intensity and locations of construction activities	Expert from Supreme Council of Antiquities	T/E GAS HSE	Review field reports + field supervision	Indicative cost to be revised and included in contractor bid \$715 / site for supervision and measurement of vibration for locations identified as “monument-critical”  T/E GAS management costs



Impact	Mitigation measures	Responsibility of mitigation	Responsibility of direct supervision	Means of supervision	Estimated Cost of mitigation / supervision
	Control dewatering process	Contractor	Supreme Council Expert + T/E GAS HSE	Field supervision	Indicative cost to be revised and included in contractor bid \$2,850 /site as “monument-critical”  T/E GAS management costs
	Reduce vibrations	Contractor	Supreme council Expert + T/E GAS HSE	Contractual clauses + Field supervision	Indicative cost to be revised and included in contractor bid \$2,150/site as “monument-critical”  T/E GAS management costs
	Preserve architecturally valuable sites	Contractor	T/E GAS HSE	Field supervision	Contractor costs (included in bid price)  T/E GAS management costs
	Preserve any found antiquity	Contractor + T/E GAS HSE supervisor	T/E GAS HSE	Field inspection throughout works and review field reports	Contractor costs (included in bid price)  T/E GAS management costs



Impact	Mitigation measures	Responsibility of mitigation	Responsibility of direct supervision	Means of supervision	Estimated Cost of mitigation / supervision
Waste disposal	<p>Identify distances to disposal sites and facilities nearest to the work area</p> <p>Classify disposal sites and facilities by type of waste accepted by the disposal. Estimate the amounts expected from each type of wastes</p> <p>Identify and contract certified hazardous waste handling and transportation contractors. Estimate handling and disposal fees according to type and amount of waste</p> <p>Estimate size of fleet required to transport wastes. Estimate tipping fees according to specific disposal sites</p> <p>For areas distant from facilities in Alexandria, consider setting up waste <b>transfer stations (possibly with primary treatment)</b> for storage hazardous waste</p> <p>Design a comprehensive handling and transportation plan for all waste types</p>	Contractor	T/E GAS HSE	Contractual clauses + review of comprehensive waste management plan	<p>Contractor costs (included in bid price)</p> <p>T/E GAS management costs</p>
	Management of excavation waste according to the waste management plan	Contractor	T/E GAS HSE supervisor	Field supervision	<p>Contractor costs (included in bid price)</p> <p>T/E GAS management costs</p>



Impact	Mitigation measures	Responsibility of mitigation	Responsibility of direct supervision	Means of supervision	Estimated Cost of mitigation / supervision
	Prevent fueling, lubricating and any activity that would entail production of hazardous materials empty containers	Contractor	T/E GAS HSE supervisor	Field supervision	Contractor costs (included in bid price) T/E GAS management costs
	Transfer empty hazardous waste containers to Alexandria facilities (Nasreya or UNICO) and landfill(s)	Contractor	T/E GAS HSE supervisor	Field supervision and review of certified waste handling, transportation, and disposal chain of custody	Indicative cost to be revised and included in contractor bid: Allocate 5 truckloads (2 tons/truck) of hazardous waste per governorate during construction x (\$715 per load for each of the 6 governorates close to Alexandria + \$1,285 per load for each of the 5 distant governorates)= \$53,570
	Adequate management of asbestos and any possible hazardous waste	Water Authority + contractor	T/E GAS HSE	Field supervision + review of Water Authority manifests	Contractor costs (included in bid price) T/E GAS management costs
Effect on structures from dewatering activities	Screening of areas / sectors	Technical Committee or independent consultant + contractor	T/E GAS Design Manager + T/E GAS HSE	Review committee's reports	Contractor costs (included in bid price) T/E GAS management costs
	Limited dewatering schedule	Contractor	T/E GAS HSE	Field supervision	Contractor costs (included in bid price) T/E GAS management costs
Dewatering	Arrange effective drainage during dewatering	Contractor	T/E GAS HSE	Field supervision	Contractor costs (included in bid price) T/E GAS management costs





Impact	Mitigation measures	Responsibility of mitigation	Responsibility of direct supervision	Means of supervision	Estimated Cost of mitigation / supervision
	Transfer any contaminated water resulting from dewatering to an adequate nearest facility	Contractor	T/E GAS HSE	Field supervision	Contractor costs (included in bid price) T/E GAS management costs
Restoration and re-pavement (رد الشيء لأصله)	Announce re-pavement plan indicating the responsibility whether it is the T/E GAS or the Governmental district units.	Contractor/ local administrations	T/E GAS HSE	Field supervision	Included in re-pavement budget agreed by T/E GAS or contractor with district units (الحى)
Effect on ecological systems	Survey proposed route or alignment of the steel high-pressure lines from secondary sources or through field investigations, as possible  Avoid sensitive or irreplaceable ecological systems, if encountered on alignment of HP steel or PE pipelines  Take necessary measures to offset or displace disrupted sensitive ecological systems	T/E GAS planning unit  Contractor	T/E GAS HSE	Review of inclusion of ecological surveys in the routing or alignment of the HP steel pipelines	Contractor costs (included in bid price) T/E GAS management costs



Impact	Mitigation measures	Responsibility of mitigation	Responsibility of direct supervision	Means of supervision	Estimated Cost of mitigation / supervision
Health and safety	<p>All soil piles will be stored a minimum of (60) cm from the sides of the excavation.</p> <p>For excavation 122 cm or deeper, stairways, ramps, or ladders will be used. For trenches, the employee must not exceed 750 cm of lateral travel to reach the stairway, ramp, or ladder.</p> <p>No employee will work in an excavation where water is accumulating unless adequate measures are taken.</p> <p>Ensure the provision of the appropriate personal protective Equipment</p>	Contractor	T/E GAS HSE	Field supervision	<p>Contractor costs (included in bid price)</p> <p>T/E GAS management costs</p>



## 7.4 Environmental Monitoring Matrix during CONSTRUCTION

Table 7-4: Environmental Monitoring Matrix during CONSTRUCTION

Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Reduction of traffic flow	Comments and notifications from Traffic Department	T/E GAS HSE	During construction. Monthly reports	Construction site	Documentation in HSE monthly reports	T/E GAS management costs
Air emissions	HC, CO% and opacity	T/E GAS HSE	Once before construction + once every six months for each vehicle	Vehicles licensing Department	Measuring exhaust emissions of vehicle, electrical unit, or heavy equipment in documented reports	\$100/ project area
Noise	Noise intensity, exposure durations and noise impacts	T/E GAS HSE	Regularly during site inspections and once during the night in every residential area or near sensitive receptors such as hospitals	Construction site	Noise meter	T/E GAS management costs
	Complaints from residents	T/E GAS HSE	During construction. Monthly reports	Construction site	Documentation in HSE monthly reports	T/E GAS management costs
Risk of damaging underground utilities and infrastructure	Official coordination reports with relevant authorities  Accidents documentation	T/E GAS HSE	During construction. Monthly reports	Construction site	Documentation in HSE monthly reports	T/E GAS management costs



Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Effect on structures by dewatering activities	Specialist assessment reports Duration of dewatering and water level	T/E GAS HSE	During dewatering activities. Reported in monthly reports	Construction site	Documentation in HSE monthly reports	T/E GAS management costs
Effects on monuments and vulnerable buildings	Vibration test results	T/E GAS HSE	During construction near sites identified by the Council	Construction site	Calibrated vibration test meter	(\$750/meter + \$160 maintenance and calibration) x 11 vibration meters = \$10,000
	Investigate possible buried antiquities	T/E GAS HSE + Supreme Council for Antiquities	Once before construction if required by the council	Streets and areas identified by the Council	Geophysical survey	\$715/km in areas designated as antiquities or monument repair zones (to be covered by T/E GAS)
Waste Management	Observation of accumulated waste piles	T/E GAS HSE	During construction. Monthly reports	Construction site	Observation and documentation	T/E GAS management costs
	Observation of water accumulations resulting from dewatering	T/E GAS HSE	During construction. Monthly reports	Around construction site	Observation and documentation	T/E GAS management costs
	Examination of chain-of-custody documents and implementation of waste management plans	T/E GAS HSE	Zonal reports	Construction site and document examination	Site inspection and document inspection	T/E GAS management costs



## 7.5 Social Management Matrix during CONSTRUCTION

Table 7-5 : Social Management Matrix during CONSTRUCTION

Impact	Mitigation measures	Responsibility of mitigation	Responsibility of direct supervision	Means of supervision	Estimated Cost of mitigation / supervision
1) Impacts on assets (land) and livelihoods of the farmers (crops)	OP 4.12 should be triggered and a resettlement Action Plan should be prepared stipulating all compensation measures	Prior to the construction in each area  EGAS, Town Gas and Egypt Gas and the Governorate	Town Gas and Egypt Gas	Ensure the implementation of RAPs	13000 \$ to prepare the RAPs  Cost of compensation can't be defined during this stage
2) Raise community people concerns due to not being connected to NG	<ul style="list-style-type: none"> <li>Try to connect the defined districts through preparing technical solutions to those who might not be connected within the limits of the approved standards</li> <li>Provide information to community members on the selection criteria for Natural Gas Connections (brochures/leaflets, awareness through NGOs)</li> </ul> <p>Follow the procedure of Grievance Redress Mechanism</p>	Along the life of the project  Town Gas and Egypt Gas	Town Gas and Egypt Gas	Ensure the implementation of GRM	No cost as it is part of the process
3) Impact on businesses due to no street rehabilitation	In compliance with the Environmental management plan concerning timely implementation of the construction schedule to minimize impact on local business <ul style="list-style-type: none"> <li>.Follow up the procedure of Grievance Redress Mechanism</li> <li>Ensure transparent information sharing</li> </ul>	During digging process  Town Gas and Egypt Gas.  The sub-contractors	Town Gas and Egypt Gas	<ul style="list-style-type: none"> <li>Ensure the implementation of GRM</li> <li>Supervision on Contractors performance</li> </ul>	No cost



<p>4) Threat to Safety of users and houses (due to limited level of awareness and misconceptions)</p>	<p>Prepare Citizen engagement and stakeholder plan</p> <p>Awareness raising campaigns should be tailored in cooperation with the community-based organizations (distribution of brochures / leaflets)</p>	<p>During the construction</p> <p>Town Gas and Egypt Gas.</p>	<p>Town Gas and Egypt Gas</p>	<ul style="list-style-type: none"> <li>• List of awareness activities applied</li> <li>• Lists of participants</li> <li>• Documentation with photos</li> <li>• Awareness reports</li> </ul>	<p>2250 \$ per awareness raising campaign</p> <p>2250 \$ for brochure and leaflets to be distributed</p>
---	---	---	-------------------------------	---	--



## 7.6 Social Monitoring Matrix during construction

Table 7-6: Social Monitoring Matrix during CONSTRUCTION

Impact	Monitoring indicators	Responsibility of monitoring	Monitoring institution (if different from responsible)	Duration/Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
1) Impacts on assets (land) and livelihoods of the farmers (crops)	<ul style="list-style-type: none"> <li>Number of PAPs compensated</li> <li>Number of PAPs who were not compensated</li> <li>Number of complaints raised</li> <li>Minutes of meetings with PAPs</li> <li>Minutes of meeting with Compensation Committee</li> </ul>	Town Gas and Egypt Gas	EGAS	Prior to the construction in each area	Site visits Desk work	Reports Minutes of meetings Complaints log	No cost
2) Raise community people concerns due to not being connected to NG	Number of complaints raised	Town Gas and Egypt Gas		Four times per year, each three months	Site and Desk work	Checklists Photos and complaints log	No cost
3) Damaging the streets	Streets quality after finishing digging  Number of complaints raised due to damaging streets	Town Gas & Egypt Gas	EGAS	Four times per year, each three months	Site and Desk work	Checklists and complaints log	No cost



Impact	Monitoring indicators	Responsibility of monitoring	Monitoring institution (if different from responsible)	Duration/Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
4) Threat to Safety of users and houses (due to limited level of awareness and misconceptions)	<ul style="list-style-type: none"> <li>• Number of awareness raising implemented</li> <li>• Number of participants in information dissemination</li> </ul>	EGAS, Town Gas and Egypt Gas		Quarterly monitoring	Office	Reports Photos Lists of participants	No cost





## **7.7 Management and Monitoring activities During Operation Phase**

---

### **7.7.1 User health and safety**

Several measures are suggested to overcome obstacles to full understanding and adoption of safety measures by the clients in the social management plan. Examples include using drawings instead of written instructions to improve communication with illiterate customers, coordinating with women of local NGOs to explain safety precautions to women in the households to be connected, and constantly monitoring the performance of emergency response units.

During all consultation activities conducted, participating NGOs offered to host awareness activities related to the NG project. EGAS has already communicated with 30 NGOs during the implementation of Greater Cairo NG project. Consequently, such activities will not necessitate additional cost. The Social Development Officers should outreach with the NGOs in order to mobilize them

### **7.7.2 Management of Odorant Handling**

### **7.7.3 Management of Repairs and Maintenance**

### **7.7.4 Management of PRS noise**

### **7.7.5 Management of PRS Safety Aspects**

### **7.7.6 Management of network integrity**



## 7.8 Environmental Management Matrix during OPERATION

Table 7-7: Environmental Management Matrix during OPERATION

Impact	Mitigation measures	Responsibility of mitigation	Responsibility of direct supervision	Means of supervision	Estimated Cost of mitigation / supervision
Management of odorant and its containers	Evacuation of odorant in holding tank and ship empty containers to a certified hazardous waste facility using certified handling and transportation contractors	PRS staff	T/E GAS HSE	Quarterly auditing for each PRS	Indicative cost to be included in PRS running budget: Estimate tonnage of empty odorant containers and multiply by \$360 per ton for transportation and disposal of waste from the 6 governorates close to Alexandria and \$640 per ton for hazardous waste from the 5 governorates distant from Alexandria
Noise of PRS operation	Locate noisy pressure reducers away from PRS borders in residential areas	T/E GAS Design Department	T/E GAS HSE	Review of PRS layout	T/E GAS management costs
	Build barrier walls between reducers and sensitive receptors when needed (as required for PRSs in residential areas)	Contractor	T/E GAS HSE	Field supervision of PRS construction	Contractor costs
Leakage and fire	Mitigations based on Quantitative Risk Assessments	Independent consultant	T/E GAS HSE	QRA Document review	\$50,000 for QRAs of all the proposed PRSs to be covered by T/E GASs
Network safety	<ul style="list-style-type: none"> <li>- Detailed review of the geotechnical and geological history of the project area</li> <li>- Development of a full emergency response plan in case of rare events which exhibit multiple simultaneous impacts</li> </ul>	T/E GASs	T/E GAS HSE.	<ul style="list-style-type: none"> <li>- Map and local geotechnical report review</li> <li>- Periodical trainings and drills</li> </ul>	T/E GAS management costs



Impact	Mitigation measures	Responsibility of mitigation	Responsibility of direct supervision	Means of supervision	Estimated Cost of mitigation / supervision
Potential risks due to PRS Operation	Remote actuation of isolation and slam-shut valves by T/E GAS for PRS and pipelines.	Designer	T/E GAS Project Dept.	PRS design Document Review	Additional budget not required
	- Produce Hazardous Area Classification drawings for all PRSs - Proper design of control room exit	Designer	Eng. / Elect. Dept. Projects Dept.	Drawing and design Document Review	Additional budget not required
	Preventive maintenance policy and station manual	PRS contractor + T/E GAS	Engineering Dept.	Policy and manual review	Included in PRS cost
	Provision of self-contained breathing apparatus (2 pieces for each station) for handling odorant leaks	T/E GAS	HSE Dept.	Inspection by operators	Include \$5000 per PRS in project budget
	Apply jet fire rated passive fire protection system to all critical safety shutdown valves ESDVs or Solenoid valves (As applicable)	Designer	T/E GAS Projects Dept.	Component inspection and design document review	Included in PRS cost
	Place signs in Arabic and English "Do Not Dig" and "High Pressure Pipeline Underneath"	T/E GAS	Engineering Dept.	Signage inspection and site visits	Additional budget not required
	Install an elevated wind sock and provision of portable gas detectors	T/E GAS	HSE Dept.	Design and implementation review	\$6000 per PRS
	The design should fully comply with IGE TD/3 code requirements	Designer	Project Dept.	Design document review	T/E GAS management costs



Impact	Mitigation measures	Responsibility of mitigation	Responsibility of direct supervision	Means of supervision	Estimated Cost of mitigation / supervision
Repairs and maintenance (network and households)	As in construction phase	Contractor	T/E GAS HSE	As relevant from construction phase	T/E GAS management costs

## 7.9 Environmental Monitoring Matrix during OPERATION

**Table 7-8: Environmental Monitoring Matrix during OPERATION**

Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Improper management of odorant during operation	Number of treated containers	T/E GAS HSE	Quarterly for each PRS	PRSs	Reviewing Environmental Register, compare with odorant delivery forms, observation of site	T/E GAS management costs
Noise of PRS operation	Noise intensity	T/E GAS HSE	Quarterly for each PRS	PRSs	Noise meter	T/E GAS management costs
Network integrity	Occurrence of earthquakes or geotechnical settlements  Emergency response time and corrective actions during emergency drills	T/E GAS HSE	Bi-annual inspections and annual emergency response drills	Along the SS-HP steel pipelines and PE pipelines	Inspection, leakage detection, running the drills	T/E GAS management costs



## 7.10 Social Management Matrix during OPERATION

Table 7-9: Social Management Matrix during OPERATION

Impact	Mitigation measures	Timing of mitigation	Responsibility of mitigation	Responsibility of direct supervision	Means of supervision	Estimated Cost of mitigation / supervision
1) Visual intrusion	<ul style="list-style-type: none"> <li>The entrance of pipes should be selected at the back of the building (if possible)</li> <li>Town Gas and Egypt Gas should develop a plan to log into the house without affecting the building. However, such plan should not affect the safety of building.</li> </ul>	During the installation of pipes	Town Gas and Egypt Gas. The sub-contractors	Town Gas and Egypt Gas.	Modified maps and designs developed to avoid visual intrusion	No cost
2) Financial burden on economically disadvantaged due to the installments	<ul style="list-style-type: none"> <li>Petro Trade should collect the installment immediately after the installation of NG</li> <li>The installments should be collected on monthly basis in order not to add burden to the poor, as it will be easier for them to pay on monthly basis</li> <li>The installment should not be high</li> </ul>	During the operation phase	Petro trade (Company responsible for collecting the consumption fees and the installments)	EGAS	Banks loans log Complaints raised by poor people due to the frequency of collecting the installments	No cost
3) Impact on the informal LPG distributors	<ul style="list-style-type: none"> <li>Lists should be obtained from the Social Fund for Development</li> <li>Provide the informal distributors and the SFD loan borrowers with the needed information about the areas that will not be served by the NG</li> <li></li> </ul>	During the operation phase	Butagasco	EGAS	Lists from the Social fund for Development	No cost



Impact	Mitigation measures	Timing of mitigation	Responsibility of mitigation	Responsibility of direct supervision	Means of supervision	Estimated Cost of mitigation / supervision
4) Possibility of Gas leakage	<ul style="list-style-type: none"> <li>• Information should be provided to people in order to be fully aware about safety procedures</li> <li>• The hotline should be operating appropriately</li> <li>• People should be informed of the Emergency Numbers</li> </ul>	During the operation phase	Town Gas and Egypt Gas. Sianco (company responsible for maintenance of appliances during operation)	Town Gas and Egypt Gas.	Complaints raised due to Gas leakage	No cost



## 7.11 Social Monitoring Matrix during operation

Table 7-10: Social Monitoring Matrix during OPERATION

Impact	Monitoring indicators	Responsibility of monitoring	Monitoring institution (if different from responsible)	Duration/Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
1) <i>Visual intrusion</i>	Number of complaints raised due to VI	Town Gas and Egypt Gas	EGAS	Four times per year, each three months	Site and Desk work	Checklists Photos and complaints log	No cost
2) <i>Financial burden on economically disadvantaged due to the installments</i>	<ul style="list-style-type: none"> <li>Number of economically disadvantaged people who complained</li> <li>Number of those who can't pay the installment</li> </ul>	Town Gas and Egypt Gas, Petro Trade	EGAS	Quarterly	Desk work	Complaints log Bank reports Petro trade reports	No cost
3) <i>Impact on the informal LPG distributors</i>	<ul style="list-style-type: none"> <li>Number of those who could not pay the installments to the Social fund for Development</li> </ul>	EGAS, Town Gas and Egypt Gas	EGAS	Quarterly	Desk work	Report from the Social Fund	No cost
4) <i>Possibility of Gas leakage</i>	Complaints raised by the community people Number of leakage accidents reported/raised	Town Gas and Egypt Gas, Sianco	EGAS	Four times per year, each three months	Site and Desk work	Complaints log Town Gas / Egypt Gas / Sianco reports	No cost



## 7.12 Reporting of Mitigation and Monitoring Activities

---

Reporting on mitigation measures and monitoring activities is a very crucial issue. Hence, it shall be undertaken by Town/Egypt Gas HSE Departments among the monthly and quarterly report currently being prepared and submitted to EGAS Environment Department. Each monthly report during design/tendering phase should include reporting on the following items<sup>7</sup>:

- Results of reviewing the pipeline alignment and route by Traffic Department and by the Supreme Council of Antiquities
- Activities and reports of the Technical Committee formed to screen areas/sectors based on structural integrity of its buildings
- Collected utility maps from Competent Authorities and identified sectors containing asbestos water pipes
- Designer adherence to safety measures of PRS and buffer zones for noise
- Review of designs, tender documents and contractors' tenders by Town/Egypt Gas HSE Department, and their adherence to mitigation measures

During construction phase monthly reports should include as a minimum:

- Conditional permits and any comments or recommendations by Traffic Department and Supreme Council for Antiquities
- Evaluation of contractor's performance on applying his relevant mitigation measures
- Procedures undertaken by experts of Supreme Council of Antiquities
- Any accidents or breaking of utility pipes
- Monitoring results of excavation machinery exhaust emission, noise and vibrations near antiquity sites, if required

During Operation phase monthly reports should include as a minimum:

- Undertaken treatment activities of empty odorant containers in PRSs
- Monitoring results of PRSs noise
- Evaluation of the adherence of PRSs' staff to safety measures

Results of each 3 monthly reports shall be analyzed in each quarterly report, with recommendations to improve performance, if required, in the following quarter.

---

<sup>7</sup> If an item is not relevant to the activities of the month, the report should indicate that such activities were not active during the month



## 7.13 Institutional Framework for ESM&MF Implementation

### 7.13.1 Existing Environmental Management Structures

Three entities will be responsible for implementation of the ESMP, namely EGAS, Town Gas and Egypt Gas.

### 7.13.2 Roles and responsibilities of EGAS and LDCs Social Development Officers

**Compliance with Bank safeguards**

**Monitoring and reporting**

**Communication with and responsiveness to targeted communities**

### 7.13.3 Required Resources

**Table 7-11: Recommended Training Courses for EGAS/Town/Egypt Gas staff**

Training course	Type of training	Participating parties	Proposed Scheduling	Cost in \$US
Tailored training on Environmental Management and monitoring for the project	Class room + on job training	Environmental Department new staff of EGAS HSE staff of Egypt Gas and new staff of Town Gas Design, Projects and Operations department staff of Town/Egypt Gas	Before detailed design of the project	\$21,500
Treatment of odorant containers	On Job training	PRS staff HSE staff of Town/Egypt Gas	To be part of the orientation of new PRS staff and HSE staff of LDC during project operation	Included LDC management costs
Safety aspects of PRS	Classroom + on Job training	PRS staff HSE staff of Town/Egypt Gas	Once before start operation of PRS To be part of the orientation of new PRS staff and HSE staff of LDC during project operation	\$14,500
Defensive driving and machinery operation safety	Classroom + on job training	Drivers and operators	Periodical	\$21,500

**Table 7-12 : Recommended Training Courses for Social Development Officers in EGAS – Town Gas – Egypt Gas**

<b>Training course</b>	<b>Type of training</b>	<b>Participating Parties</b>	<b>Proposed Scheduling</b>	<b>Cost Estimate In \$</b>
• <b>Information about Natural Gas project</b>	Workshop + on the job training	Social Development Officers Community leaders	Prior to the project	2250 \$
• <b>Promotion of Awareness Raising Activities</b>	Workshop + on the job training	- Social Development Officers	Once before the project implementation Refreshment course during the implementation of the project	3000\$
• <b>Communication Skills</b>	Two days' Workshop + on the job training	Social Development Officers	- One workshop during the beginning of the project implementation	750\$
• <b>OP 4.12 with emphasis on involuntary actions and grievances</b>	One day Workshop + on the job training	Social Development Officers	- One workshop during the beginning of the project implementation	750\$
• <b>Egyptian laws related to land acquisition (if needed)</b>	One day Workshop + on the job training	Social Development Officers	- One workshop during the beginning of the project implementation	750\$
• <b>Community Participation Tools</b>	One day Workshop + on the job training	Social Development Officers	- One workshop during the beginning of the project implementation	750\$
• <b>Consensus Building Techniques</b>	One day Workshop + on the job training	Social Development Officers	- One workshop during the beginning of the project implementation	750\$
• <b>Monitoring and Evaluation mechanisms (M&amp;E)</b>	Two days' Workshop + on the job training	Social Development Officers Project management unit	- One workshop during the beginning of the project implementation	1500\$

## 7.14 ESM&MP Budget Summary

A summary of the proposed budget for the Environmental and Social Management & Monitoring Plan (ESM&MP) is presented below.

Exchange Rate: US\$ = 7.00L.E as of January 2014  
 Exchange Rate: € = 9.60L.E. as of January 2014

Cost in \$US	ESM&MP component
Mitigation Components	
158,000	Specific ESIA's for each governorate
143,000	Mitigation of PRS air emissions and gas analyzers for 25 PRS
54,000	Hazardous waste management during construction
50,000	Quantitative Risk Assessments
58,000	Various Environmental training and capacity-building programs
72,000	Emergency fund for repairing damage to underground utilities
38,000	Social Management Plan (including RAP)
573,000	Mitigation Subtotal
Monitoring Components	
10,000	Vibration monitoring
10,000	Air emissions monitoring
125,000	Breathing suits for 25 PRS
72,000	Contingency and unexpected costs
217,000	Monitoring Subtotal
790,000	<b>Total</b> (Seven Hundred Eighty Thousand US dollars)

The ESM&MP budget total is 790,000 US dollars excluding:

- Gross cost of recruiting full-time HSE personnel (\$34,000 per recruit per year)
- Cost of ESM&MP for work in antiquities areas (\$2000 per km or \$2500/site)

## 8 Stakeholder Engagement and Public Consultation

The public consultation chapter aims to highlight the key consultation and community engagement activities and their outcomes, in addition to outlining the key aspects to be addressed when holding the consultation activities of the (11) site-specific ESIAAs upon final project detailing.

Throughout the various consultation and engagement activities, the work teams experienced and recorded remarkable and overwhelming public acceptance, even eagerness, by the community and the governmental stakeholders towards the proposed project. The indignity and financial hardships experienced by scores of Egyptian families (especially women) in obtaining LPG cylinders (the current household fuel) was revealed through testimonies all over the country. Aside from a limited number of concerns regarding street rehabilitation after construction works and options of installation fee payment; the glaring message from governmental and community consultations was to commence implementation ASAP (with repeated requests to expand coverage beyond what is planned for the project).

Consultation activities (scoping, interviews, focus group discussions, public hearings/consultations) with various stakeholders and community people in the host communities were held for the proposed 1.1 million household NG connections project in compliance with:

- WB policies related to disclosure and public consultation, namely,
  - o World Bank Procedure (BP 17.50)
  - o World Bank Operational Policy (OP 4.01)
- Egyptian regulations related to the public consultation
  - o Law 4/1994 modified by Law 9/2009

Objectives of various consultation activities are summarized as follows:

- 1- Define potential project stakeholders and suggest their possible project roles
- 2- Disseminate comprehensive information about the project to enable stakeholders to identify their concerns, needs, and recommendations.
- 3- Document stakeholder feedback and enhance the ESIAF accordingly
- 4- Identify the most effective outreach channels that support continuous dialogue with the community
- 5- Discuss potential resettlement plans and impacts of involuntary resettlement

### 8.1 Defining the stakeholder

Given the fact that the project exact routes and project details have not been finalized at this stage, stakeholder identification was based on analysis of geographical, legal, institutional, and operational scope of the project. The following table represents the stakeholders contacted and engaged for the consultation events:

Table 8-1 Main stakeholders identified for the Framework

Stakeholder	Role/ concern
<b>Local Governmental entities</b>	
Governorates	The main role of the governorates is the provision of support to the project through mobilizing people to gain information about the project. Media is known to shed light on activities of the governorate entities
Local Governmental units (District authorities and village authorities)	<ul style="list-style-type: none"> <li>- Permissions for the lands needed for PRS should be prepared by the governorate and approved by the LGU.</li> <li>- Rehabilitation of roads, which is one of the major issues raised by the community, will be performed by the LGU.</li> </ul>
<b>Other governmental entities</b>	
Information Centers on the governorate level	Provide NG companies with underground utilities and infrastructure maps.
Governmental Authorities	Various authorities in the governorate will support the project through permissions for excavation works, maintenance, health related issues, etc.
The Social Fund for Development	Offers loans in LPG distribution startups.
Egyptian Environmental Affair Agency (HQ and RBOs)	Responsible for reviewing and approving ESIA's, and monitoring implementation of the Environmental Management Plan
Security Department	Secure the construction sites and prevent people from in- flushing into it
Ministry of Health	Providing health facilities to the project workers
Ministry of Tourism	Relevant to project implementation in Touristic Governorates such as Aswan, Qena, Matrouh, and Alexandria.
Ministry of Antiquities	Very important to issue permissions for excavations and accompany the working teams, particularly, in Sohag and Aswan which are rich in monuments.
<b>Media</b>	
Television and radio representatives	Inform the community about the project and its impacts and support dissemination of ESIA studies
Press people	
Websites editors	
<b>NGOs working on environmental and social related aspects</b>	
NGOs on the central level	Play an active role in any awareness-raising related to the project
NGOs on district level	May provide financial support to the poorer customers
Specific union of NGOs	
<b>Universities and Educational institutes</b>	
Faculty of Engineering	Review and enrich the ESIA study with feedback
Secondary vocational schools	Propose needed capacity building for their students to potentially find employment with the project
Researchers/consultants	Review results of the study and provide feedback
<b>Other</b>	
Private companies	Mainly potential tenderers for construction works
Traders	Provide workers with food and amenities.
Contractors	From the project adjacent areas, may be affected.
<b>Community people</b>	
Community leaders	Main cornerstone in mobilizing the communities.
Heads of tribes	In Marsa Matrouh city, provide security to the pipelines. Their approval to allow the project to cross their lands should be obtained during the early stage of the project.
Potential beneficiaries	Potentially benefit from the project

Stakeholder	Role/ concern
Potential Project Affected Persons (PAPs)	Farmers whose lands may be traversed by project components. LPG distributors( formal and informal), LPG storage workers.
<b>Natural Gas companies</b>	
EGAS	Implementing agency overseeing activities of the Environmental and Social Management Plan
Egypt Gas	Local distribution company (LDC) who will implement, operate, and manage the ESMP
Town Gas	Local distribution company (LDC) who will implement, operate, and manage the ESMP
Butagasco	May be affected due to the installation of the NG
Petro trade	They are the responsible entity for collecting the consumption fees and the bank installment

The abovementioned stakeholders were consulted using various tools i.e. Individual interviews, group meetings and public consultation. Most of them have attended the public consultation hearings conducted during December 2013 in the 11 governorates. However, some of them were interviewed in their premises in order to enable them to spell out their concerns and worries freely.

## 8.2 Consultation Methodology and Activities

3441 community members were engaged directly. Consultations were conducted on various levels to outreach all levels of stakeholders.

### 8.2.1 Public scoping sessions

- Giza and Qalubia Governorates on November 24<sup>th</sup> of 2013 in Flamenco Hotel.
- Upper Egypt Governorates on November 26<sup>th</sup> 2013 in Maraga City Hall, Sohag.
- Delta governorates on November 28<sup>th</sup> 2013 in Menufia University Hotel.

### Participants profile

Participants of the scoping session consultation events represented different categories of stakeholders from the targeted areas. In total, 251 persons attended those sessions, of which 198 were males and 53 were females. The males represented (78.9) % of the total participants, while females represented only (21.1%) This is relatively a high presentation of females comparing to similar projects implemented in the same Governorates.

Diversity in age and educational backgrounds was reflected in participants' contributions and enriched the session with a wide range of opinions. The visits paid to introduce the project to the community were an appropriate aperitif that drove the community people to be more willing to get information about the project. The diversity between literate and illiterates, workers and unemployed enriched the discussion to a



Photo 1: Advertisement published in El Ahram related to the 3 scoping sessions

great extent. A variety of organizations as well as representatives from governmental and community based authorities, institutes, and entities also took part in these scoping session meetings.

- 35.5% from governmental entities
- 17.7% from government environment sector
- NGOs (4.6% in Giza , 15.9% in Menufia and 20.3% in Sohag)
- Five TV, press and Radio reporters attended the 3 scoping meetings.
- Community people (technicians, service sales laborers and teachers)

### Summary of discussions

All participants expressed their eagerness for commencement of project implementation without further delay and many participants demanded the extension of the project to additional areas. Following is a summary of all discussions conducted.

Subject	Questions and comments	Responses
LPG cylinder problems	Speeding up the environmental and social studies and permissions so as to launch the construction phase as soon as possible	<ul style="list-style-type: none"> <li>• EcoConServ is preparing the ESIAF study required to obtain EEAA approval.</li> <li>• EGAS is working on obtaining other required permissions</li> </ul>
Recommendation to enhance the project performance	<ul style="list-style-type: none"> <li>• EGAS should obtain detailed information about all project areas and develop a report about each area</li> <li>• The installation of NG should be obligatory not optional</li> <li>• EGAS should share infrastructure maps developed for the project with the Local Governmental units</li> <li>• The selection of project areas should be revisited</li> <li>• All towns and cities should be connected</li> </ul>	<ul style="list-style-type: none"> <li>• The exact streets will be defined at a later stage. Thereafter, an ESIAF will be prepared for each governorate</li> <li>• EGAS cannot oblige anyone to have NG installed</li> <li>• All available information will be shared with the Local Governmental Units</li> <li>• Project areas were selected based on certain criteria as presented</li> <li>• This project is one of a series of projects that aim at connecting all houses to NG</li> </ul>
Scope of social study	It is important to meet with informal LPG distributors and house guards in the project areas	<ul style="list-style-type: none"> <li>• This task is within the scope of ESIAF study</li> </ul>
Awareness activities and NGOs roles	Will the project undertake any awareness activities? Local NGOs should be integrated in these activities	<ul style="list-style-type: none"> <li>• Awareness activities are among the recommendations of the ESIAF study</li> </ul>
Street rehabilitation	<ul style="list-style-type: none"> <li>• It is crucial to study the impacts on streets and the restoration process</li> <li>• Street restoration should not be the responsibility of Local Governmental units</li> </ul>	<ul style="list-style-type: none"> <li>• All impacts will be fully investigated</li> <li>• Restoration alternatives are                             <ol style="list-style-type: none"> <li>1. Restoration will be fully undertaken by NG companies (Town Gas – Egypt Gas)or</li> <li>2. NG companies will pay local governmental units to carry out restoration works</li> </ol> </li> </ul>
Considering alternative sources of energy	In addition to NG, EGAS should consider also making use of solar energy and biogas	<ul style="list-style-type: none"> <li>• This particular project is limited to NG. However, solar and wind energy projects are being implemented by the New and Renewable Energy Authority on the national level</li> </ul>

Subject	Questions and comments	Responses
NG installations for houses constructed with no official permits	It is crucial not to install the NG to illegally constructed houses.	<ul style="list-style-type: none"> <li>One of the requirements for installing NG is the provision of an electricity bill. Houses constructed without the necessary permits do not have access to 'state electricity' and will not be able to provide the required bills.</li> </ul>
NG installation to areas with no sewage system	Areas with no access to a sewage system should not be deprived of NG as well. This is not fair.	<ul style="list-style-type: none"> <li>NG should be the last facility to be installed. This is mainly due to safety requirements</li> </ul>
Vulnerable groups working in LPG distribution	EGAS should consider meeting the poor and marginalized groups working in LPG distribution	<ul style="list-style-type: none"> <li>Vulnerable groups are an essential component of this study. Due attention will be given to them. They will be investigated during the ESIAF</li> </ul>
Poor people	EGAS should provide a subsidy enabling the poor to install NG	<ul style="list-style-type: none"> <li>The NG connection is already subsidized by the state. Thus, it is recommended that other entities step in to provide additional support to the poor</li> </ul>
Visual intrusion	The pipelines damage the entrance of houses and diminish the aesthetic value of buildings	<ul style="list-style-type: none"> <li>We try to follow the maximum safety procedures while at the same time minimizing damage to houses. Plans to minimize visual intrusion have been developed</li> </ul>

### 8.2.2 Data collection activities

- 44 mini group meetings were conducted in 29 project areas, attended by 263 members of community and governmental entities.
- 36 individual meetings were conducted in the 11 governorates with governmental stakeholders. In addition, 16 individual meetings were conducted with the LPG distributors.
- 1904 Households were consulted in various project areas.
- Dual meetings were conducted held with 20 persons in Marsa Matrouh city as households will be provided NG for the first time governorate-wide.
- A leaflet about the project was prepared and uploaded to the website. Thereafter, 1000 leaflet were printed and distributed during the site visits<sup>8</sup>:
  - Brief description of the project
  - Potential impacts of the project
  - Total number of installations

### Participants profile

In addition to the above mentioned, mini meetings and individual interviews were conducted in the 11 governorates. The community people on the district level were interviewed. As well as, the health centers' service providers, the LPG distributors, NGOs and Governmental entities. Participants were of a variety of age categories. Young people were motivated to attend the meetings held in their own premises. Females were strongly represented at 26.9% of the participants. Consultations with women took place in homes, LPG storerooms, and NGOs. Some consultation activities were conducted informally. A casual ambience was adopted during consultations to encourage people to spell out their concerns freely.

<sup>8</sup> Details are presented in the SIA document (submitted to WB and EGAS in parallel to this report).





Photo 2: Woman interviewed in the NGO



Photo 3: Consultation on the street

### Summary of discussions

The discussion addressed/documentated the following:

- 1- Options of poorer customers to receive additional financial support
- 2- Physical and financial burdens of LPG cylinders and dilemmas during shortage
- 3- Corruption related to LPG distributors
- 4- Credible information due to the misconceptions related to NG safety
- 5- Feasibility of connecting NG to rural areas and remote ones
- 6- Importance to integrate community based organizations in awareness activities
- 7- Monitoring and maintenance of the grid
- 8- NG job opportunities for areas adjacent the project
- 9- Cooperation with the LGU throughout the life of the project

### 8.2.3 Final public consultations

Consultation activities were conducted in the 11 Governorates during the last 10 days of December 2013. Parallel teams implemented the consultation activities.

- Four consultants from EcoConServ (two environmental and two social)
- Eight representatives of EGAS, Town Gas and Egypt Gas
- Four representatives of EEAA accompanied the teams over the 11 governorates
- 2 administrative managers and numerous drivers

Table 8-2: 11 Consultation activities conducted during the final consultation phase

Governorate	Date	Venue
Aswan	21st of December 2013	Governorate Hall (Arous El Neil)
Menoufia	21st of December 2013	Governorate Hall
Qena	23rd of December 2013	Girls Club Hall in Qena city
Giza	23rd of December 2013	Army Hotel Hall
Matrouh	25th of December 2013	Nile centre for Media
Sohag	25th of December 2013	Local Popular Council
Alexandria	26th of December 2013	Mercure Hotel
Daqahlia	29th of December 2013	Marshal Hotel
Gharbeia	29th of December 2013	Panorama Hotel
Qalubia	30th of December 2013	Egypt Public Library in Benha
Ismailia	30th of December 2013	Media Compound in El Sheikh Zaid

The list of invitees was developed by EEAA regional branches, environmental offices of the governorates, NGOs, governmental media centers, and various government employees, in cooperation with the Consultant. Invitees were informed of the date and location of the Public Consultation at least two weeks ahead. Participants were invited through:

- 1- Invitations sent by EGAS via mails, Faxes and e-mails.
- 2- Telephone communication by EGAS and the Consultant.
- 3- An advertisement was published in El Ahram El Mesay followed by a second advertisement published in Aswan Newspaper and El Esboua Newspaper.
- 4- Aswan Newspaper presented a news clip about the project prior to the event.
- 5- A simplified Fact-sheet/brochure in Arabic (500 copies) distributed:: i) Governorates that the project will be implemented in, ii) general description of the project, iii) Potential long and short term impacts of the project .



Photo 4: One of the developed posters

Hearings/consultations were held in adequately situated and equipped venues affiliated to NGOs, Media centers, Governorate, and hotels. In Sohag, Qena, and Aswan minibuses were rented to move people from the remote areas to the public consultation venues.

### Participants profile

971 participants attended the 11 final consultation events. Participants reflected different categories of stakeholders from the project targeted areas. Female participation was targeted throughout advertising and invitation process. The highest representation of women was noted in Ismailia Governorate (60.8%) while the least representation of females were found in Matrouh. Taking the unique cultural traits of Matrouh into account, additional mini meetings were conducted with the females on the governmental employees and residents levels. Matrouh as invitations extended to heads of tribe and the NGOs working on the tribal levels.

Overall, special attention was paid to involving young groups and females as they are most affected by the physical hardships of obtaining the LPG cylinders. The physically-challenged were represented in consultation activities through NGOs working with them.

- NGOs represented 14.9% of the participants among which 70.0% of them work on the solid waste management and street afforestation
- 42.0% of the participants represented governmental entities (Local Governmental Units, Road Authority, the Urban planning, etc.)
- Governmental environmental sector represented 15.8% of the total participants (EEAA regional branches, governorate EMU and local environmental units)
- 38.8% of the total participants held administrative jobs
- 26.5% specialists (Lawyers, professors, businessmen, chemists, etc.)
- 23.8% of the total participants were of top managerial positions (government) and heads of municipalities
- Technicians and specialists represented 6.8%
- 2.0% were students.

### Summary of discussions

All consultation events started with a summary of the project and the Natural Gas in Egypt. Using PowerPoint and multimedia, representatives of EGAS, Town Gas and Egypt Gas presented detailed information about all project activities.

Using PowerPoint and multimedia, EcoConServ experts presented the ESIAF to the community people. Simple wording was used whenever possible by the environmental and social expert in order to be comprehended by the members of community. The resettlement policy framework was presented as an important element of the final public consultation.



Photo 5: A tribe leader in Matrouh Gov.



Photo 6: Participants in Daqahlia Governorate

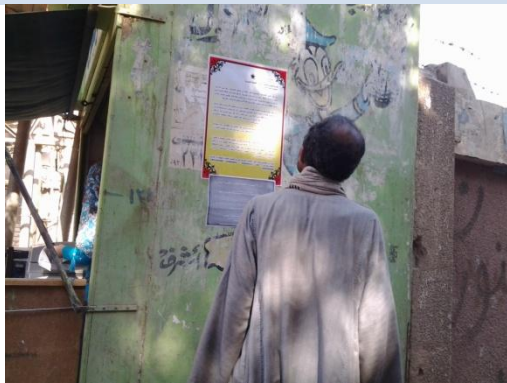


Photo 7: Posters in Sohag Governorate.



Photo 8: Consultation event in Sohag Governorate

During breaks, Media interviewed EGAS representatives, government officials, community members, and the consultants. The main issues raised during these interviews were as follow:

- 1- General information about the Natural Gas
- 2- Positive and negative impacts of the NG
- 3- The rules and regulations of EEAA
- 4- The role of stakeholders and community participation

Each session ended with an open discussion lasting for a couple of hours.

Table 8-3: Key comments and concerns raised during the Final Public Consultations

Subject	Questions and comments	Responses
Damaging underground utilities and infrastructure during digging	Will the implementing agencies avoid damaging the underground utilities/facilities and infrastructure?	All necessary procedures should be carried out to avoid damaging underground utilities/facilities and infrastructure. In case any facilities are damaged, they will be restored

Subject	Questions and comments	Responses
Collaboration with governmental entities and information centers	Many governmental entities (Local Governmental Units, Information centers, Road Authority, Water resource, Mayors...etc.) are willing to cooperate with the project to facilitate work. Will this be possible?	It is crucial to collaborate with these entities in order to obtain information, maps and permissions
Role of community based organization and tribe leaders	It is recommended to cooperate with members of civil society in order to increase awareness	Civil Society members play a major role in carrying out awareness raising activities as well as securing the financial aid to poor people
Role of the Army	EGAS should consult and contribute with the army in the frontier governorates	Their approvals and permissions are key to implementing project activities
Reduction the installation cost	It is recommended to: 1. Take the LPG cylinder as an advance payment for the NG. Thereafter, the poor pay by installment 2. Cooperate with the Ministry of Social Solidarity to reduce the installation cost for poor 3. Mobilize the local community and the NGOs to provide support to poor	It is difficult to adopt these recommendations
People living with disabilities	At least 5% of jobs provided by EGAS should be filled by people with disabilities	This recommendation will be taken into consideration
Appropriate time for construction	Matrouh, Alexandria and Ismailia are touristic areas. Thus EGAS should avoid working there during summer time	This recommendation will be taken into consideration
Restoration of streets	All attendees voiced their concern about damaging the streets without restoring them after the completion of installation activities due to the bad performance of the Local Governmental Unit (corruption)	Two alternatives of street rehabilitation were investigated: - Restoration will be fully undertaken by NG companies (Town Gas – Egypt Gas)or - NG companies will pay local governmental units to carry out restoration works
Some devices cannot be operated by the NG	We use a baking stove. This will not be operated by the NG. What should we do?	The baking stove can't be connected to the NG for safety purposes
Awareness activities	Awareness activities should cover the following: Contact person in the site (foreman) GRM personnel Hotline for damage and maintenance Website and SMS	This recommendation will be taken into consideration
Job opportunities	The jobs provided by this project should be made available to the local community	It is more economically viable to provide jobs to the local community

<b>Subject</b>	<b>Questions and comments</b>	<b>Responses</b>
Remote areas and suburbs	NG should be installed to remote areas and the suburbs	They will be concerned in later stage
Capacity building	EGAS should raise the capacity of community members in order to enable them to work in the project	This will be investigated and implemented whenever possible
Paying by installment	Does the proposed system for paying by installment contain any interest?	The bank should have their interest rate
Criteria to select certain areas to install the NG	What are the criteria to select the project areas	There are numerous selection criteria based on economic aspects and technical consideration
Safety measures	What are the safety measures followed by the NG companies	We apply the maximum standards of safety (British standards)

### **Second Public Consultation Disclosure Activities**

The importance of the project for the government and the community was reflected in remarkable media coverage. Media covered events and interviewed participants:

- 1- **Newspapers: El Youm 7, El Masry El Youm, El Watan**
- 2- **News websites: El Ahram, El Borsa website, El Shrouk, Aswat Mesria, El Mashad, Misr El Youm**
- 3- **Aswan governorate website, ONA news**
- 4- **Tibah and Canal National TV channels**