



**1.5 Million Natural Gas Connections
Project in 11 Governorates**

**Site-Specific Environmental and
Social Impact Assessment**



EGAS

Egyptian Natural Gas Holding Company

**Executive Summary
Aswan City/Aswan Governorate
September 2016**

Developed by



EcoConServ Environmental Solutions



Petrosafe

**Petroleum Safety & Environmental Services
Company**

EXECUTIVE SUMMARY

1 Introduction

The Government of Egypt (GoE) has immediate priorities to increase household use of natural gas (NG) by connecting 1.2 million 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 1.5 Million households over the next 4 years. The project presented in this study is part of a program that involves extending the network and accompanying infrastructure to connect 1.5 million Households in 11 Governorates between 2016 and 2019 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 program is estimated to cost US\$850 Million.

The ESIA objectives are as follows:

- Describing project components and activities of relevance to the environmental and social impacts assessments
- Identifying and addressing relevant national and international legal requirements and guidelines
- Describing baseline environmental and social conditions
- Presenting project alternatives and no project alternative
- Assessing potential site-specific environmental and social impacts of the project
- Developing environmental & social management and monitoring plans in compliance with the relevant environmental laws
- Documenting and addressing environmental and social concerns raised by stakeholders and the Public in consultation events and activities

As the project involves components in various areas within the 11 governorates, the parties to the project agreed that Site-Specific Environmental and Social Impact Assessments (SSESAs) for each of the project sub-areas within the governorate will be prepared. Guided by the 2013 Environmental and Social Impact Assessment Framework (ESIAF) and Supplementary Social Impact Assessment Framework (SSIAF), this is the site specific ESIA for the connections network planned for the Aswan City in Aswan Governorate. The project in Aswan city will provide 4,000 household connections in Sharq Aswan, Aswan City. They are segregated as follows: 500 household connections in year 1 of the project, 1,500 in year 2, and 2,000 in year 3.¹

The local distribution company responsible for project implementation in Aswan City is Egypt Gas or (شركة غاز مصر).

¹ Source: Eng. Yosra Assaker, the project manager in EGAS



2 Project Description

2.1 Background

Natural Gas 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 areas² 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.

2.2 Project Work Packages

2.2.1 Main feeding line/network “7 bar system – PE 100”

A gas distribution piping system that operates at a pressure higher than the standard service pressure delivered to the customer. In such a system, a service regulator is required to control the pressure delivered to the customer.

Main feeding lines are mainly constructed from polyethylene pipes (HDPE) with maximum operating pressure (MOP) below 7 bar.

2.2.2 Distributions network “Regulators, PE80 Networks”

A gas distribution piping system in which the gas pressure in the mains and service lines is substantially the same as that delivered to the customer’s Meters. In such a system, a service regulator is not required on the individual service lines.

Distribution networks are mainly constructed from polyethylene pipes (MDPE) with MOP below 100 millibar.

2.2.3 Installations (Steel Pipes)

A gas distribution piping system consists of steel pipes which are connected from individual service line to vertical service pipe in a multistory dwelling which may have laterals connected at appropriate floor levels; in addition to service pipe connected to a riser and supplying gas to a meter and gas appliances on one floor of a building.

Internal Installation consists of a pipe connecting the pressure reducing regulator/district governor and meter outlet (MOP 25 millibar) to appliances inside the customer’s premises.

2.2.4 Conversions

Conversions involve increasing the diameter of the nozzle of the burner of an appliance to work with natural gas as a fuel gas rather LPG or others.

² Because natural gas is odorless, odorants facilitate leak detection for inhabitants of residential areas.



3 Legislative and Regulatory Framework

3.1 Applicable Environmental and Social Legislation in Egypt

- Law 217/1980 for Natural Gas
- Law 4 for Year 1994 for the environmental protection , amended by Law 9/2009 and law 105 for the year 2015.Executive Regulation(ER) No 338 for Year 1995 and the amended regulation No 1741 for Year 2005, amended with ministerial decree No 1095/2011, ministerial decree No 710/2012, ministerial decree No 964/2015, and ministerial decree No 26/2016
- Law 38/1967 for General Cleanliness
- Law 93/1962 for Wastewater
- Law 117/1983 for Protection of Antiquities
- Traffic planning and diversions
 - Traffic Law 66/1973, amended by Law 121/2008 traffic planning
 - Law 140/1956 on the utilization and blockage of public roads
 - Law 84/1968 concerning public roads
- Work environment and operational health and safety
 - Articles 43 – 45 of Law 4/1994, air quality, noise, heat stress, and worker protection
 - Law 12/2003 on Labor and Workforce Safety
 - Book V on Occupational Safety and Health (OSH)
 - Minister of Labor Decree 48/1967.
 - Minister of Labor Decree 55/1983.
 - Minister of Industry Decree 91/1985
 - Minister of Labor Decree 116/1991.

3.2 World Bank Safeguard Policies

Three policies are triggered for the project as a whole: Environmental Assessment (OP/BP 4.01), Physical Cultural Resources (OP/BP 4.11), and Involuntary Resettlement (OP/BP 4.12).

However, OP/BP 4.12 will not be applicable to **Aswan City** as no land acquisition or resettlement activities are anticipated. Particularly, as the network will pass through the main urban roads/streets and side roads without causing any damage to private assets or lands.

In addition to the above mentioned safeguards policies, the Directive and Procedure on Access to Information³ will be followed by the Project.

³ <https://policies.worldbank.org/sites/ppf3/PPFDocuments/Forms/DispPage.aspx?docid=3694>



4 Analysis of Alternatives

4.1 No Project Alternative

This Natural Gas Connections to Households Project is expected to yield many economic and social benefits in terms of providing a more stable energy source, achieving savings in LPG consumption and enhancing 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.

4.2 Energy Alternatives

- **Maintain LPG Use:** Introduction of piped natural gas to replace LPG will help to remove subsidies and reduce imports. The proposed project would also improve the safety of gas utilization as appliance standards are strictly controlled and only qualified personnel carry out installations and respond to emergencies. In the case of LPG, installations are not carried out by trained personnel resulting in possible unsafe installations and unsafe use of LPG.

- **Convert to Electricity:** The second alternative is to convert all homes to use electricity for all energy supply applications. 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.

- **Use Renewables:** the renewables market does not present feasible, practical, and affordable alternatives to connecting 1.5 million households at this point in time in Egypt. Biogas requires large amounts of agricultural and domestic waste, while solar panels and heaters remain in pilot phase.

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

The average natural gas connection installation cost is about 5600 EGP and consumers contribute a part of 1700 LE because the connection is heavily subsidized by the Government. This payment can be made either upfront or in installments over a period of time. Installment schemes are available to all community people.

The government of Egypt is negotiating with the project's financing organizations in order to secure additional subsidy to poor and marginalized groups. They also provide facilitation payments strategies through offering various installment schemes. The following are the main types of installments: 138 EGP/Month for 12 months, 74 EGP/Month for 24 months, 52 EGP/Month for 36 months, 42 EGP/Month for 48 months, 35 EGP/Month for 60 months, 31 EGP/Month for 72 months and 28 EGP/Month for 84 months.

5 Environmental and Social Impacts and Mitigations

The environmental and social advantages of switching household fuel from LPG cylinders to



natural gas pipelines are diverse. On the residential level, the proposed project will lead to improved safety, reduced physical/social/financial hardships, and secure home fuel 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.

The assessment of impacts distinguishes between the construction phase and the operation phase.

5.1 Positive Impacts

5.1.1 During the construction phase

Provide direct job opportunities to skilled and semi-skilled laborers

- The project is expected to result in the creation of job opportunities, both directly and indirectly. Based on similar projects implemented recently by EGAS and the local distribution company, the daily average number of workers during the peak time will be about 100 workers. The local community of Aswan Governorate could theoretically provide a proportion of this temporary labour force depending on skills needed and the strategies of the individual contractors in sourcing their workforce.
- The total number of new short term job opportunities within the project area is estimated at 500 temporary jobs.
- In order to maximize employment opportunities in the local communities it is anticipated that training will be required for currently unskilled workers. On-the-job training will also supplement opportunities for the local workforce for both temporary construction roles and for long-term operation phase positions, where these are available.

Create indirect opportunities

As part of the construction stage, a lot of indirect benefits are expected to be sensed in the targeted areas due to the need for more supporting services to the workers and contractors who will be working in the various locations. This could include, but will not be limited to accommodation, food supply, transport, trade, security, manufacturing... etc.

5.1.2 During the operation phase

- As indicated in the Baseline Chapter, women are key players in the current domestic activities related to handling LPG and managing its shortage. Being the party affected most from the shortfalls of the use of LPG, the NG project is expected to be of special and major benefits to women. This includes, but is not limited to, clean and continuous



source of fuel that is safe and does not require any physical effort and is very reasonable in terms of consumption cost. Time saving is among the benefits to women. The use of a reliable source of energy will allow women to accomplish the domestic activities in less time and this will potentially open a space for better utilization for the saved time.

- Constantly available and reliable fuel for home use.
- Reduced expenditure on LPG importation and subsidies, as 4 thousand connections will be installed in the area. Each household consumes about 2 LPG cylinders monthly. Accordingly, the total number of LPG cylinders consumed is about 8 thousand LPG cylinders per month. The subsidy value is about 70 EGP per each LPG cylinder. Consequently, the total saved monthly subsidy will be about 560 thousand EGP monthly. This will result in total annual savings of 6.72 million EGP.
- Significantly lower leakage and fire risk compared to LPG.
- Improved safety due to low pressure (20 mBar) compared to cylinders.
- Beneficiaries to benefit from good customer service and emergency response by qualified personnel/technicians.
- Eliminate the hardships that special groups like the physically challenged, women, and the elderly had to face in handling LPG.
- Limiting possible child labor in LPG cylinder distribution

5.2 Anticipated Negative Impacts

5.2.1 Impact Assessment Methodology

To assess the impacts of the project activities on environmental and social receptors, a semi-quantitative approach based on the Leopold Impact Assessment Methodology with the Buroz Relevant Integrated Criteria was adopted.

The table below presents the classification of impact ratings and respective importance of impact values.

Importance of Impact	Impact rating	
0-25	None or irrelevant (no impact);	
26-50	Minor severity (minimal impact; restricted to the work site and immediate surroundings)	
51-75	Medium severity (larger scale impacts: local or regional; appropriate mitigation measures readily available);	
76-300	Major severity (Severe/long-term local/regional/global impacts; for negative impacts mitigation significant).	

The following tables summarize the impacts and the corresponding mitigation measures within the management plan, in addition to the monitoring plans proposed for implementation.



5.3 Environmental and Social Management Matrix during CONSTRUCTION

Table 1: Environmental and Social Management Matrix during CONSTRUCTION

Receptor	Impact	Mitigation measures	Responsibility		Means of supervision	Estimated Cost of mitigation / supervision
			Mitigation	Supervision		
Local traffic and accessibility	Traffic congestion (and associated noise/air emissions)	Excavation during off-peak periods	Excavation contractors	<ul style="list-style-type: none"> - LDC + - Traffic department 	Contractor has valid conditional permit + Field supervision	Contractor costs LDC management costs
		Time limited excavation permits granted by local unit & traffic department				
		Announcements + Signage indicating location/duration of works prior to commencement of work	<ul style="list-style-type: none"> - LDC - Excavation contractors 	<ul style="list-style-type: none"> - LDC HSE - Local Unit - Traffic department 	Ensure inclusion in contract + Field supervision	
		Apply Horizontal Directional Drilling under critical intersections whenever possible to avoid heavy traffic delays	Contractor	LDC HSE	Field supervision	
		Traffic detours and diversion	Traffic Department	Traffic Department	Field supervision for detouring efficiency Complaints received from traffic department	
Road restructuring and closing of lanes	Fluidity of traffic flow					
Ambient air quality	Increased emissions of dust and gaseous pollutants	Controlled wetting and compaction of excavation/backfilling surrounding area	Excavation Contractor	LDC HSE	Contractual clauses + Field supervision	<ul style="list-style-type: none"> - Contractor costs - LDC management costs
		Isolation, covering, transportation in equipped vehicles and disposal of stockpiles			Contractual clauses + Field supervision	



Receptor	Impact	Mitigation measures	Responsibility		Means of supervision	Estimated Cost of mitigation / supervision
			Mitigation	Supervision		
		Compliance to legal limits of air emissions from all relevant equipment – Availability of 24-7 hotline service (129) to all beneficiaries and the public for reporting possible leaks, damages or emergencies – Quick response to gas leaks by evacuation of the affected area – Repair or replacement of failed component	LDC	LDC HSE	Measure and document emissions of machinery by regular audits request emission measurements Field Supervision	
Ambient noise levels Local community Workers	Increased noise levels beyond WB/National permissible levels	Ear muffs, ear plugs, certified noise PPE for workers Avoid noisy works at night whenever possible	– LDC – Excavation Contractor	LDC HSE	Contractual clauses + Field supervision (audits) Field supervision Complaints receipt from local administration	– Contractor costs – LDC management costs
Ground utilities' integrity Local community	Damage to underground utilities resulting in water/wastewater leaks, telecommunication and electricity	Coordination with departments of potable water, wastewater, electricity, and telecom authorities to obtain maps/ data on underground utilities, whenever available	Excavation Contractor	LDC HSE	Official coordination proceedings signed by representatives of utility authorities – Examination of site-specific reports and records – Field supervision	– Contractor management costs – LDC management costs



Receptor	Impact	Mitigation measures	Responsibility		Means of supervision	Estimated Cost of mitigation / supervision
			Mitigation	Supervision		
	interruptions	<p>If maps/data are unavailable: Perform limited trial pits or boreholes to explore and identify underground utility lines using non-intrusive equipment</p> <p>Preparation and analysis of accidental damage reports</p> <p>Repair and rehabilitation of damaged components</p>		<p>LDC HSE Supervisor</p> <p>LDC HSE</p> <p>LDC HSE Local Government Unit Local Police</p>	<p>– Contractual clauses + Field supervision</p> <p>– Review periodic HSE reports</p> <p>– Contractual clauses + Field supervision</p>	
<p>Streets (physical status) local community and workers (health and safety)</p>	Hazardous waste accumulation	<ul style="list-style-type: none"> – Temporary storage in areas with impervious floor – Safe handling using PPE and safety precautions – Transfer to LDC depots for temporary storage – Disposal at licensed Alexandria hazardous waste facilities (Nasreya or UNICO) – Hand-over selected oils and lubricants and their containers to Petro trade for recycling 	<ul style="list-style-type: none"> – LDC – Excavation Contractor 	LDC HSE	Field supervision and review of certified waste handling, transportation, and disposal chain of custody	<p>Indicative cost items included in contractor bid: Chemical analysis of hazardous waste Trucks from licensed handler Pre-treatment (if needed) Disposal cost at Nasreya</p> <p>Approximate cost of the above (to be revised upon project execution): 8,000-10,000 LE per ton</p>



Receptor	Impact	Mitigation measures	Responsibility		Means of supervision	Estimated Cost of mitigation / supervision
			Mitigation	Supervision		
		<ul style="list-style-type: none"> - Adequate management of asbestos and any possible hazardous waste 	Water Authority + contractor		Field supervision + review of Water Authority manifests	<ul style="list-style-type: none"> - Contractor costs - LDC management costs



Receptor	Impact	Mitigation measures	Responsibility		Means of supervision	Estimated Cost of mitigation / supervision
			Mitigation	Supervision		
		<ul style="list-style-type: none"> - Minimize fueling, lubricating and any activity onsite that would entail production of hazardous materials empty containers - Pre-Plan the anticipated amounts of hazardous liquid materials (such as paint, oils, lubricants, fuel) to be used in the various activities in order to minimize leftovers and residuals. - To the extent practical, seek to combine leftovers or residuals of the same liquid material/waste in order to minimize the number of containers containing hazardous residuals - Ensure hazardous liquid material/waste containers are always sealed properly and secured from tipping/falling/damage/direct sunlight 	<ul style="list-style-type: none"> - LDC - Excavation Contractor 		Field supervision	



Receptor	Impact	Mitigation measures	Responsibility		Means of supervision	Estimated Cost of mitigation / supervision
			Mitigation	Supervision		
		<ul style="list-style-type: none"> - during transportation and storage - In case of spillage: <ul style="list-style-type: none"> o avoid inhalation and sources of ignition o cover and mix with sufficient amounts of sand using PPE o collect contaminated sand in clearly marked secure containers/bags - Add sand to inventory of hazardous waste 				
Local community	Non-hazardous waste accumulation	<ol style="list-style-type: none"> 1. Designate adequate areas on-site for temporary storage of backfill and non-hazardous waste 2. Segregate waste streams to the extent possible to facilitate re-use/recycling, if applicable 3. Reuse non-hazardous waste to the extent possible 4. Estimate size of fleet required to transport wastes. 5. <u>Transfer waste to disposal facility South of Aswan City</u> 	<ul style="list-style-type: none"> - LDC - Excavation Contractor 	LDC HSE	<ul style="list-style-type: none"> - Contractual clauses - Monitoring of waste management plan - Field supervision 	<ul style="list-style-type: none"> - Contractor costs - LDC management costs



Receptor	Impact	Mitigation measures	Responsibility		Means of supervision	Estimated Cost of mitigation / supervision
			Mitigation	Supervision		
Local community	Destruction of streets and pavement	<ul style="list-style-type: none"> - Arrange Restoration and re-pavement (رد الشيء لأصله) with local unit - Communication with local community on excavation and restoration schedules. 	<ul style="list-style-type: none"> - LDC in cooperation with the LGU 	EGAS	<ul style="list-style-type: none"> - Field supervision - Coordination with LGU as needed 	Included in re-pavement budget agreed by LDC with local units or Roads and Bridges Directorate
Occupational health and safety	Health and safety	<ol style="list-style-type: none"> 1. Full compliance to EGAS and LDC HSE requirements, manuals, and actions as per detailed manuals developed by Egypt Gas 2. Ensure the provision of the appropriate personal protective Equipment and other equipment needed to ensure compliance to HSE manuals 	Excavation Contractor	LDC HSE and EGAS SDO	Field supervision	<ul style="list-style-type: none"> - Contractor costs - LDC management costs



Receptor	Impact	Mitigation measures	Responsibility		Means of supervision	Estimated Cost of mitigation / supervision
			Mitigation	Supervision		
Local communities and businesses	Lack of accessibility to businesses due to delay in street rehabilitation	<p>Compliance with the Environmental management plan concerning timely implementation of the construction schedule to minimize impact on local business</p> <ul style="list-style-type: none"> Follow up the procedure of Grievance Redress Mechanism Ensure transparent information sharing 	<p>During digging process</p> <p>LDC</p> <p>The sub-contractors</p>	LDC and EGAS SDO	<ul style="list-style-type: none"> Ensure the implementation of GRM Supervision on Contractors performance 	No cost
Local community Health and safety	Threat to Safety of users and houses (due to limited level of awareness and misconceptions)	<p>Prepare Citizen engagement and stakeholder plan</p> <p>Awareness raising campaigns should be tailored in cooperation with the community-based organizations</p>	<p>During the construction</p> <p>LDC</p>	LDC and EGAS SDO	<ul style="list-style-type: none"> List of awareness activities applied Lists of participants Documentation with photos Awareness reports 	<ul style="list-style-type: none"> 2250 \$ per awareness raising campaign 2250 \$ for brochure and leaflets to be distributed (material available by EGAS-\$ spent)



5.4 Environmental and Social Monitoring Matrix during CONSTRUCTION

Table 2: Environmental and Social Monitoring Matrix during CONSTRUCTION

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Local traffic and accessibility	Reduction of traffic flow and accessibility to local community	Comments and notifications from Traffic Department	LDC HSE	Monthly during construction.	Construction site	Documentation in HSE monthly reports Complaints log	LDC management costs
Ambient air quality	Increased air emissions	HC, CO% and opacity	LDC HSE	Once before construction + once every six months for each vehicle	Vehicles licensing Department	Measurements and reporting of exhaust emissions of construction activities machinery Complaints log	LDC management costs
Ambient noise levels	Increased noise levels	Noise intensity, exposure durations and noise impacts	LDC HSE	Regularly during site inspections and once during the night in every residential area or near sensitive receptors such as hospitals	Construction site	Measurements of noise levels Complaints log	LDC management costs
		Complaints from residents	LDC HSE	Monthly during construction.	Construction site	Documentation in HSE monthly reports	LDC management costs
Underground utilities	Damages to underground utilities and infrastructure	Official coordination reports with relevant authorities Accidents documentation	LDC HSE	Monthly during construction.	Construction site	Documentation in HSE monthly reports	LDC management costs



Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Physical state of street	Waste generation	Observation of accumulated waste piles	LDC HSE	During construction. Monthly reports	Construction site	Observation and documentation	LDC management costs
		Observation of water accumulations resulting from dewatering (if encountered)	LDC HSE	During construction. Monthly reports	Around construction site	Observation and documentation	LDC management costs
		Chain-of-custody and implementation of waste management plans	LDC HSE	Zonal reports	Construction site and document examination	Site inspection and document inspection	LDC management costs
Local community	Damaging to the streets	<ul style="list-style-type: none"> - Streets quality after finishing digging - Number of complaints due to street damage 	LDC, EGAS	Four times per year, each three months	Site and Desk work	Checklists and complaints log	No cost
Local community	Threat to Safety of users and houses (due to limited level of awareness and misconceptions)	<ul style="list-style-type: none"> - Number of awareness raising implemented - Number of participants in information dissemination 	LDC, EGAS	Quarterly monitoring	Office	Reports Photos Lists of participants	No cost



5.5 Environmental and Social Management Matrix during OPERATION

Table 3: Environmental and Social Management Matrix during OPERATION

Receptor	Impact	Mitigation measures	Responsibility		Means of supervision	Estimated Cost
			Mitigation	Supervision		
<ul style="list-style-type: none"> - Ambient air quality - Community health and safety 	Network integrity	<ul style="list-style-type: none"> - Detailed review of the geotechnical and geological history of the project area - Development of a full emergency response plan - Random inspections and awareness campaigns to ensure that NG piping and components (both inside the household and outside) are not be altered, violated, or intruded upon in any way without written approval from, or implementation of the alteration by, the LDC. - Availability of 24-7 hotline service (129) to all beneficiaries and the public for reporting possible leaks, damages or emergencies - Quick response to gas leaks by evacuation of the affected area - Repair or replacement of failed component 	LDC	LDC HSE.	<ul style="list-style-type: none"> - Map and local geotechnical report review - Site inspections - Awareness actions - Periodical trainings and drills 	LDC management costs
<ul style="list-style-type: none"> - Ambient air quality - Community health and safety 	Repairs and maintenance (network and households)	As with construction phase activities	<ul style="list-style-type: none"> - LDC - Excavation Contractor 	LDC HSE	As relevant from construction phase	LDC management costs



Receptor	Impact	Mitigation measures	Responsibility		Means of supervision	Estimated Cost
			Mitigation	Supervision		
Economically disadvantaged Community members	Financial burden on economically disadvantaged due to the installments	<ul style="list-style-type: none"> - Petro Trade should collect the installment immediately after the installation of NG - 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 - The installment should not be high 	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
Informal LPG distributors	Loss of revenue for LPG distributors	<ul style="list-style-type: none"> - LPG distributors should be informed about the NG potential areas in order to enable them to find alternative areas - They should be informed about the GRM in order to enable them to voice any hardship 	Butagasco	EGAS	Information sharing activities with the LPG vendors Grievances received from them	No cost
Community health and safety	Possibility of Gas leakage	<ul style="list-style-type: none"> - Information should be provided to people in order to be fully aware about safety procedures - The hotline should be operating appropriately - People should be informed of the Emergency Numbers 	LDC	LDC	Complaints raised due to Gas leakage	No cost



5.6 Environmental and Social Monitoring Matrix during OPERATION

Table 4: Environmental and Social Monitoring Matrix during OPERATION

Impact	Monitoring indicators	Responsibility of monitoring	Monitoring Frequency	Location of monitoring	Methods of monitoring	Monitoring Estimated Cost
Network integrity	<ul style="list-style-type: none"> - Earthquakes or geotechnical settlements - Emergency response time and corrective actions during emergency drills - Reports of alteration or tampering with ANY gas components 	LDC HSE	Bi-annual inspections and annual emergency response drills	Along the network and inside and outside households	- Inspection, leakage detection, running the drills	LDC management costs
Financial burden on economically disadvantaged due to the installments	<ul style="list-style-type: none"> - Number of economically disadvantaged people who complained - Number of those who can't pay the installment 	LDC and Petro Trade, EGAS	Quarterly	Desk work	<ul style="list-style-type: none"> - Complaints log - Bank reports - Petro trade reports 	No cost
Impact on the informal LPG distributors	<ul style="list-style-type: none"> - Grievance received from the informal LPG distributors - Information shared with them 	EGAS, LDC	Quarterly	Desk work	- Complaints log	No cost
Possibility of Gas leakage	<ul style="list-style-type: none"> - Complaints raised by the community people - Number of leakage accidents reported/raised 	LDC, EGAS	Four times per year, each three months	Site and Desk work	Complaints log LDC	No cost



6 Stakeholder Engagement and Public Consultation

The public consultation chapter aims to highlight the key consultation and community engagement activities that took place as part of the preparation of the ESIA and their outcomes. Following are the main groups consulted during the ESIAF and SSESIA and the engagement tools used.

Table 5. Summary of Consultation Activities in Aswan Governorate

Participants	Number		Methods	Date
During the preparation of framework				
	Males	Females		
Potential beneficiaries and government officials	25	9	FGD	October-November 2013
Governmental and NGOs	5	1	In-depth	November 2013
Community people	39	55	Structured questionnaire	October-November 2013
Potential beneficiaries, government officials, NGO representatives	119	30	Public consultation	21 st of December 2013
Total	188	95		
During the site specific study				
Potential beneficiaries and government officials	29	29	FGD	September and October 2015
Governmental and NGOs	6	2	In-depth	
Community people	154	147	Structured questionnaire	
Potential beneficiaries, government officials, NGO representatives,	64	15	Public consultation	9 th of February 2016
Total	253	193		

6.1 Main Results of Consultation during the Data Collection Phase

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. This trend is attributed to the fluctuation of the LPG cylinders prices.

Following is the main issues of discussion raised during data collection and scoping phase

Table 6. Key comments and concerns raised during the Final Public Consultations

Subject	Questions and comments	Responses
Strategies to outreach with the community people and	1- It is proposed to reach out with the community people through TV or radio. It is strongly recommended to hire a communication expert 2- It is recommended to	EGAS reached out with the community through: 1- Publishing an advertisement in national newspaper two weeks ago 2- Sent invitations to stakeholders



Subject	Questions and comments	Responses
	<p>adhere to bank procedure 17.5 related to disclosure</p>	<p>3- Recruit two persons from Aswan City NGOs who have long experience in arranging public consultations in Aswan</p> <p>4- Direct telephone calls were conducted to encourage people to attend this event</p> <p>EGAS applied a campaign in Egypt Radio and printed brochures to be distributed to people</p>
<p>Importance of NG project</p>	<p>The NG project is an essential project that will enable the Egyptian society to benefit from without adding burden to the national budget</p>	<p>It is widely known the importance of the NG project. The study conducted reflected that the community people are willing to have the NG but they still need information.</p>
<p>Strategies to install the gas to poor people</p>	<p>It is strongly recommended to propose alternative mechanisms that encourage poor people to install the NG</p>	<p>EGAS has developed in cooperation with the National Bank of Egypt 7 types of installment mechanisms. The total cost of NG installation is 5500 EGP. The client pays only 1700 EGP. The remaining cost is financed by the Government of Egypt. The client pays around 65 EGP for the LPG and water heater electricity cost. Paying in installment will reduce such cost to about 35 EGP</p>
<p>Safety measures for community people</p>	<p>What are the safety measures followed by the NG companies?</p>	<p>NG companies apply the maximum standards of safety (British standards)</p> <p>In case of damaging a pipeline, the NG supply is stopped immediately and an emergency team head to the leakage area to solve the problem</p> <p>The NG is lighter than air. If you have leakage in your apartment just switch off gas valve and open windows.</p> <p>There is also emergency telephone lines working 24 hours, 7 days a week. The line number is 129</p>
<p>Architecture and human heritage</p>	<p>There is antiquities and architectural areas in Edfu that should be considered</p>	<p>There will be an architectural management plan that enable the LDCs to avoid any impacts on monuments and human heritage assets</p>
<p>Employment and job opportunities</p>	<p>It is strongly recommended to employ the residents of Aswan, Kom Ombo and Edfu</p>	<p>It is more economically to provide jobs to the residents of Aswan. The job opportunities will be mainly</p>



Subject	Questions and comments	Responses
		digging. A subcontractor will be recruited to do this work and monitored by Egypt Gas. For the high technical workers and technicians they will be from Egypt Gas. The vocational graduates are preferred to work in the project
Extending the project to other areas	Will Daraw District be connected to the NG as part of the project	
Benefits of the NG connection and positive impacts on the areas that will not be connected	The NG connections in Aswan city, Edfu and Kom Ombo will result in positive impacts on other areas that will benefit from the LPG cylinder. The project will save about 45 thousand LPG cylinder per month	
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: <ul style="list-style-type: none"> - Restoration will be fully undertaken by NG companies (Egypt Gas) or - NG companies will pay local governmental units to carry out restoration works. The practical solution was disbursing money to the LGU. They do the restoration after completing other utilities in the area in order to prohibit any street cut activities for at least 5 years
Collection of consumption cost	The performance of fee collectors is weak. They stopped coming for three months. They appeared now asking for high cost vouchers	Petrotrade is the company responsible for fee collection. They confronted with problems and demonstrations conducted by their workers. Thus, they were unable to collect the fees
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
Collaboration with governmental entities and information centers and coordination	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 A coordination meeting will be implemented at the beginning of the construction phase. The information center is targeted to obtain all maps and utilities afterwards, I share with



Subject	Questions and comments	Responses
		<p>them the NG maps.</p> <p>In case of absence of information the LDC try to have a kind of excavations that enable defining the utilities in this area.</p> <p>NG companies try to avoid any impacts on utilities as damaging utilities cost money and time</p>
Role of community based organization (NGO)	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
Mountain dwellings	The residents of mountain areas are keen to have the NG installed. Will they be able to install the gas?	They will be able to if they are connected to sanitation network
Impacts on the dwellings	Many houses collapsed during the construction of the sanitation network. Will the NG be the same	
Absence of environmental law and monitoring	Who should apply and execute the environmental law. The companies in Aswan violate the law without any problems	<p>Egypt gas is committed to apply environmental laws without any violation. The monitoring falls under EGAS responsibility. This event is being documented and will be shared with EGAS and the World bank as monitoring process</p> <p>Regarding violating the law, that falls under the responsibility of inspection and monitoring department</p>
Digging level	What is the level of digging for the NG?	The level of digging is limited to one meter. This is in compliance with the international laws
Grievance mechanism	What if anyone needs to complain about the project?	<p>There is a grievance and redress mechanism that enables aggrieved person to voice his concerns and worries:</p> <ol style="list-style-type: none"> 1- First he should give his complain to site engineer (foreman 2- Then to Egypt gas headquarter 3- EGAS
The funding agency	Is the world bank the funding entity? Do they have any restrictions	The world bank is the funding agency. It is a loan not a grant. EGAS was obliged to borrow money to complete the installation plan. They have certain procedures that the project should be fully adhered to
Pressure reduction stations and land needs	The presentation did not provide any idea about the PRS and the impact on lands	There will be no new PRSs. Consequently the impacts will be limited to digging the roads



Subject	Questions and comments	Responses
Appliances that can be connected to the NG	It is known that some appliances is not eligible to be connected to the NG i.e. Baking ovens, heaters...etc. What are the appliances that can't be connected/	The NG will be installed in the cooker and the water heater. But other appliances can't be connected due to safety measure
The impact of odor	What is the impact of odor?	There is no impact of odor on the workers and the community. The tanks of odor will be disposed according to a contract with professional waste management company
Closed apartments	It is recommended to inform about the project and try to reach out the closed apartments. The owners might be abroad on traveling for a short time. They should be informed about the project	The construction team inform the community people during the P&A survey. Additionally, the construction workers stay in the area for a month. The doormen are informed. the LDCs use various method to inform the community people
Documents required to install the NG	What are the documents needed for NG contracting?	The lease or ownership of the apartment contract New electricity bill Other documents are published in the contracting caravan

6.2 Summary of Consultation Outcomes

Site specific consultation efforts included most of concerned stakeholders – persons/households affected by the project activities, civil society organizations representing the interest of the community, or regulatory and governmental bodies who will play a role in facilitating or regulating the implementation of site-specific project activities.

There was overwhelming acceptance of the project among whole stakeholders. Few concerns were raised about the technical specifications of the NG that prevent some households from benefitting from the NG. The need of rigid monitoring mechanism was reported by stakeholders. Monitoring of the pipelines and the performance of the NG workers. It was comprehended that the heads of the governmental units are eager to cooperate with the project, particularly, in terms of street rehabilitation. Grievance and redress mechanism was a request raised by some of the stakeholders. Lack of information about the NG remains as one of the barriers facing the project.

While WB safeguards and regulations state that a minimum of two large-scale, well-publicized public consultation sessions are a must for projects classified as category 'A' projects like the one at hand⁴, additional consultation activities (for example through focus group discussions, in-depth meetings, and interviews) were implemented to reach the most vulnerable and difficult to reach community members. Additionally, in order to

⁴ Clause 14 of OP 4.01 states that: "For Category A projects, the borrower consults these groups at least twice: (a) shortly after environmental screening and before the terms of reference for the EA are finalized; and (b) once a draft EA report is prepared. In addition, the borrower consults with such groups throughout project implementation as necessary to address EA-related issues that affect them."



obtain larger scale and more quantifiable information, the consultant has conducted surveys in different sites.

