

## Management Stages Analysis of Petrol and Gas in Gaza Strip

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**Abstract:** This study aimed at identifying the reality of managing hazardous materials in the gas and petrol sectors in the Gaza Strip. It also aimed at identifying the most important stages of managing this sector in order to present a proposal to improve its management system. To achieve these goals, the researchers adopted the analytical descriptive approach. The researchers used interviews and the analysis of local reports issued by the General Authority of Petroleum in Gaza Strip. The findings of the study indicated the most important stages of managing gas and petrol which start with demanding then directing it to the Israeli or Egyptian companies, followed by supplying, distributing, storing, trading, transporting and getting rid of waste. The study recommended that there is an urgent need to update the laws and regulations of distributing, planning and organizing safety in the gas and petrol stations. And also, to prepare a national guide for the management of risks of petroleum and gas for working environment and urban societies.

**Key Words:** Hazard analysis - hazardous material management – petrol and gas sectors - Gaza Strip.

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### I. Introduction

Petrol and gas are hazardous substances present in high-risk facilities that negatively affect the lives of citizens in the event of accidents and crises. Upon leakage, they cause explosion and fire. The weather and the quantity of materials present in the stations are also factors that play roles in gas and petrol hazards. The impact of the risks varies according to the population and urban density that contributes to the spread of the risks to the residential environment. The most important of these risks is the distribution of gas and petrol stations in some urban and population settlements. Gas and petrol transferred to the Gaza Strip from the Israeli side through the Karm Abu-Salem crossing and from Egypt through the Rafah land crossing, according to the stages determined by the General Authority for Petroleum in the Gaza Strip. The quantities of petrol and gas are determined daily according to the need for the Gaza Strip. The closure of the crossings affects the occurrence of crises in the need of the Palestinian society to petrol and gas. The demand phase for petrol and gas from the Egyptian and Israeli sides is the first phase of fuel management<sup>1</sup>. The stages of the hazardous materials management are very important in determining the nature of the available hazardous material. The most important stage is the transport operations and the compliance extent of the transportation of dangerous substances with national conventions and how the protection of workers and public health and prevention leakage of hazardous materials in the surrounded environment during transfer and trading are taken into account<sup>2</sup>.

### 1.2 Problem of the study and research questions

According to the nature of the researchers work, having a look at research studies guide in health and safety of work, there was an urgent need for the existence of specialized studies focusing on analysis of the management of hazardous materials sectors (gas and petrol) to find out the main risks which face workers in the management stages, so the main question emerged as the following:

#### What are the stages of managing hazardous materials in the gas and petrol sectors in the Gaza Strip?

The following research sub-questions were raised:

- What is the reality of the hazardous materials management in petrol and gas sectors in the Gaza Strip?
- What are the stages of petrol and gas management in the Gaza Strip?
- How can we reduce the risks of petrol and gas management operations in the Gaza Strip?

### 1.3 Aims of the study

The study aims to:

- Mentioning the reality of hazardous materials management in the Gaza Strip, especially in the field of petrol and gas.

- Mentioning the management of petrol and gas stages in the Gaza Strip.
- Presenting proposals to improve the petrol management system in the Gaza Strip.

#### **1.4 The Importance of the study**

##### **1.4.1 The scientific importance**

This study is one of the most important studies that needed in the Gaza Strip, particularly concerned with the management of hazardous materials in light of the lack of empirical studies that determine the mechanisms and methodologies for petrol and gas management in the Gaza Strip. The study can be a scientific reference for researchers and libraries.

##### **1.4.2 The practical importance**

This study is expected to contribute in improving the mechanisms of managing the petrol and gas sectors in the Gaza Strip, which could benefit the employees of the Palestinian Civil Defense, the General Authority of Petroleum and the owners of stations and companies operating in the field of petrol and gas in the Gaza Strip.

#### **1.5 Previous studies**

After the extensive research in the literature for previous studies, the researchers found the lack of studies related to the management stages of the petrol and gas in the Arab region and the Gaza Strip in particular. The studies that talk about hazardous materials and its management are few in the Arab and the local regions but there is a set of acts and international conventions from the international institutions of this issue. Each country has a special regulation in the requirements for obtaining permits to build petrol and gas stations.

##### **1.5.1 Abu Sharekh (2018) study entitled: Analysis of the Management for General Administration of Pharmacy in Gaza Strip by Using SWOT Analysis<sup>3</sup>.**

In this study, the descriptive analysis was used by interviews with stakeholders related to the General Administration of Pharmacy in Gaza strip. General Administration of Pharmacy faces a deficit in the preparation of field inspectors on pharmaceutical companies. Also, the participation rates of the Civil Defense and the Ministry of Labor were reduced in joint inspection and control through committees that contribute to the control of all safety procedures and the prevention of risks. And it is difficult to export pharmaceuticals to the West Bank from Gaza factories because of division and occupation. The authors recommend a presence of a clear definition of all stakeholders and responsibilities of the three parties of production (government - workers in for General Administration of Pharmacy - owners of companies, institutions and private pharmaceutical organizations). Also, laboratories need to conduct hormone tests to ensure that is good for uses. The pharmaceutical system should be modernized according to international standards and indicators. The authors also recommend developing a computerized administrative system that connects the parties of production, institutions, companies and pharmaceutical warehouses. In addition to that, there must be a consolidation of decisions related to the General Administration of Pharmacy and the presence of a special national strategy for the pharmaceutical sector isolated from the ministry of health.

##### **1.5.2 Tah (2017) study entitled: Environmental Analysis Based on Geographic Information Systems (GIS) for oil filling stations in Kaduna Metropolis<sup>4</sup>.**

The study aimed to demonstrate the impact of sites petroleum filling stations on the urban environment with high population density after the increase in the number of petrol stations in the city of Kaduna raised questions about the mechanism of distribution. To achieve the goals, the researchers follow the descriptive analytical approach by obtaining information from land use maps in Kaduna state and get geographical images from the Kaduna system for geographic information systems (KGIS). The study analyzed the Kaduna gas stations in accordance with the planning standards specified by the Ministry of Petroleum Resources. The study found that there are 228 filling stations located along 26 roads in the study area and there is a remarkable relationship between the number of filling stations and the route. And that 86% of the filling stations did not meet the minimum distance of 100 m from health care facilities. 84% did not meet the minimum standards of 400 meters to other stations located on the same side of the road. The study recommended that regulatory bodies take appropriate measures to ensure compliance by petrol station operators with standards. And the redistribution of petrol filling stations within the city of Kaduna equally, a difference was observed With regard to compliance with standards, where regulatory bodies should consider the issue, take appropriate measures and should in the future ensure that sites meet minimum standards.

### **1.5.3 Comments on previous studies**

The researchers did not find a local or foreign study interested in the stages of the management of petrol and gas. The present study is in agreement with Abu Sharekh study in terms of the region and differs from it in terms of the sector and methodology. Abu Sharekh study concerned with the danger of pharmaceuticals while this study concerns the danger of petroleum products and derivatives. This study is in agreement with the study of Tah in terms of the petroleum sector, as well as the methodological approach and analysis, but differs in the tools used in the analysis. This study is characterized by dealing with stages of the management of hazardous petroleum materials in the Gaza Strip as a fragile area.

## **II. Material And Methods**

### **2.1 Methodology of the study**

The researchers adopted the analytical descriptive approach that describes the phenomenon and analyzing its effects by studying all the stages that dealing with petrol and gas in the Gaza Strip through direct observation and visiting of the petrol supply crossings and government petrol stores near the crossings and meeting the employees of the Civil Defense Department. Stages and actors in the management of those stages were followed and investigated.

### **2.2 Definitions of the study**

#### **2.2.1 Stations for the sale and distribution of Petrol and Gas**

Installations custom eligible for the activity of the sale and distribution of petroleum fuels and materials, possessed either by the public sector or the private sector<sup>4</sup>

#### **2.2.2 Petrol Station**

The place that intended to establish a system using electrical power to supply all mobile and fixed vehicles or machines of all kinds of official hydrocarbons approved by the General Authority for Petroleum<sup>5</sup>

#### **2.2.3 Petrol**

A flammable liquid for all machinery and vehicles, it is the product of petroleum refining processes known as hydrocarbons (benzene, diesel and kerosene). It has internationally recognized brands and are classified as hazardous substances, as well as various types of oils and greases that help in the operation of vehicles and machines<sup>5</sup>.

#### **2.2.4 Petrol transferring vehicles**

Are the vehicles used as a means of transporting fuel (gasoline, diesel, kerosene) and have licenses from the General Directorate of Civil Defense, the General Authority for Petroleum and the Ministry of Transport and Communications<sup>6</sup>.

#### **2.2.5 Liquefied petroleum gas, LPG**

Are the gases with the properties of the natural and the chemical are compressed into closed containers transition from a gaseous state to the liquid state and used for many activities<sup>5</sup>.

#### **2.2.6 Filling and selling gas station**

Are the spaces designated for the sale and packaging of LPG cylinders and may be owned by the private or public sector<sup>5</sup>.

#### **2.2.7 Gas transporting cars**

Are the vehicles used to transport LPG in large quantities placed in tanks with special specifications, to be approved by the General Directorate of Civil Defense, the General Authority for Petroleum and the Ministry of Transport and Communications after conducting the necessary tests<sup>5</sup>.

#### **2.2.8 Operational definition of the crossing**

It is the point of contact between the Israeli or Egyptian sides and the Gaza Strip for supplying the needed goods and fuel.

## **III. Result and Discussion**

### **3. Stages of petrol and gas management in the Gaza Strip<sup>7</sup>**

Stages of petrol and gas management suffer from many challenges and changes, especially with regard to political and security aspects and the closure of crossings and economic situation and availability of finance

to request petrol, in addition to legal factors related to procedures, government policies and regulations followed. The petrol and gas management stages in the Gaza Strip have been divided as follows.

### **3.1 Phase I: Demanding of petrol and gas**

The competent companies in the import of gas and petrol submit the required applications to the office of the General Authority of Petroleum in Gaza. The applications then transferred to the General Authority for Petroleum in the West Bank which submits an application to the Israeli company that is contracting with the Palestinian Authority to supply petrol and gas to the Palestinian territories through the Karm Abu-Salem crossing. For importing petrol and gas from Egypt, the General Authority for Petroleum in Gaza is transferring the request to the Egyptian company, which is contracting with the Ministry of Finance in Gaza, to transfer the required quantities from the Rafah crossing<sup>8</sup>.

#### **The challenges**

When submitting applications, the order must be submitted one day prior to delivery and the price must be paid in advance, and the order must be according to the exact need since any increase in quantity becomes a burden on the crossing because there are no tanks in the place. In the case of lacking the required quantity which sometimes occurs, some companies lose their request in that day and the fare tanker car returns empty from the Karm Abu-Salem crossing<sup>9</sup>.

### **3.2 Stage 2: Supplying of petrol**

Petrol and gas are received in two ways:

#### **3.2.1 The first one**

Supplying of petrol (diesel, petrol, gas, diesel generation plant, kerosene) from Israel through the Karm Abu-Salem crossing, according to the contract between the Palestinian National Authority and the Israeli companies competent in supplying petrol to the West Bank and Gaza Strip. Karm Abu-Salem is located at the east of the Gaza Strip; it is equipped with pumps and extensions at the Israeli side of the crossing. The Palestinian side provided by pipes, valves and extensions without any safety requirements and accidents prevention. The daily production capacity of the crossing is 1.5 million liters of diesel, 400 thousand liters of gasoline, 300 tons of cooking gas. This quantity is supplied by 6-inch line by two pumps for diesel, and 4-inch line with one pump for gasoline and 8-inch line with one gas pump<sup>10</sup>.

#### **The Challenges**

The researchers see that this method is declining with the productive capacity of the crossing compared with the needs of the Gaza Strip, which contributes to the emergence of continuous crises in the petrol and gas, especially the gas during the closure of the crossing in the Jewish holidays. The Gaza Strip is suffering from a crisis in the cooking gas since the end of 2012 and even the supply of gas from the Egyptian side especially in winter every year.

#### **3.2.2 The second one**

Supplying of petrol (diesel, Gasoline, Gas and diesel for the power station) from Egypt through the Rafah land crossing according to the authorization with the Ministry of Finance in Gaza to supply the necessary petrol for the Gaza Strip. The supply quantity required is brought by the Egyptian petrol charged tanks by cargo then unloaded in government warehouses adjacent to the Rafah crossing for which is equipped in March 2018 as it is equipped with 10 pumps with a production capacity of 500 thousand liters per hour with a capacity of 2 million liters. These warehouses are available with all the safety elements and prevention systems, electronic controls, especially the use of electronic counters<sup>11</sup>.

#### **The Challenges**

The researchers believe that the second method is facing financial challenges for the traders and companies and the government in the Gaza Strip and suffers from the weakness of the political, security and economic stability. The profit resulting from the supply of petrol is low from Egyptian gas in addition to poor efficiency of the cars of the Egyptian transport petrol and non-compliance with standards Local tanks, which can increase the rate of residual petrol waste production in tanks, raising the deficit in the public administration and local companies. Work is underway to address the problems of petrol losses.

### **3.3 Stage III: Petrol and gas discharge**

#### **3.3.1 Method 1, at the Karm Abu-Salem Crossing**

The petrol is unloaded by pumps installed at the end of a spare from the Israeli side. The petrol pumped in the pipes dedicated to the transfer of petrol of 8-inch gas capacity, 6-inch fuel and 4 -inch gasoline<sup>11</sup>.

#### **3.3.2 Method 2, at Rafah Petroleum Crossing**

Petrol from Egyptian cars is emptied into underground petrol tanks by means of iron pipes that declining with 8%. It stands on the floor of the car tilted degree 8% for unloading by tanks. The gas is unloaded from the Egyptian cars directly to the stations distributed in the Gaza Strip<sup>11</sup>.

### **3.4 Phase IV: Petrol and gas loading**

#### **3.4.1 Method 1, at the Karm Abu-Salem crossing**

Cars are charged at the Karm Abu-Salem crossing from one vehicle to another directly. The Palestinian vehicles must be present on the lines beside a spare in front of pumping. In the absence of the Palestinian vehicles no petrol can be received, so Palestinian vehicles are considered to serve as warehouses for fuel<sup>10</sup>.

#### **3.4.2 The second method of, at the Rafah oil terminal**

Cars are loaded with petroleum materials stored in tanks located in the area surrounding the Rafah crossing by withdrawing the petrol from the pumps connected to the tanks. They have 3-inch openings and hoses. They operate at a capacity of 900 liters per minute according to the capacity of the pump. Electronic totalizer accounts for the amount of petrol that is pumped into transport vehicles. An integrated electronic system linked to a room control center of the storage area operates this process. It can also work on the Egyptian incoming and mobilizing Palestinian cars at the same time unloading without hindrance or effect. The gas unloading and packing are operated in the Gaza Strip stations directly<sup>5</sup> Figure (1) and Figure (2) show the Egyptian gas and the Egyptian Rafah warehouse.



**Figure (1)** Gas cars coming from the Egyptian side. Source: The Researchers.



**Figure (2)** Petrol Vehicles from the Egyptian Side during discharge at the Rafah petroleum crossing. Source: The researchers

### 3.5 Phase 5: Transfer of petrol from the crossing to the stations

Having been talking about the mechanism of packing Palestinian petrol tanks either from Rafah or Karm Abu-Salem petroleum crossing, in this section we will talk about the mechanism of transferring petrol and gas tanks. Before transferring all petrol and gas cars must be permitted annually from the General Directorate of civil defense and the Ministry of Transport and Communications, and the General Authority for Petroleum.

#### 3.5.1 Types of tanks:

##### Portable tanks, (tanker)

These are reservoirs installed on cars and designed to be loaded with petrol products at crossings or warehouses and then transferred from place to another. It divided into several compartments (3-7). Each room has a specific size and made of iron of 4mm thickness<sup>5</sup>. Figure (3) shows a photograph of vehicles with installed petrol tanks.



**Figure (3)** Image of tanker. Source: The researchers

##### Fixed tanks

Tanks are made of iron, with special specifications for storing petrol at stations, stores or crossings. Some fixed tanks are used underground or above ground. Fixed tanks are made of iron of 6 mm thickness and are often a non-divided<sup>12</sup>. Figure (4) shows an image of fixed tanks that used to transfer petrol from the crossings to the Palestinian side areas.





Figure (4). Image of Fixed Tanks (Stores). Source: The researchers.

### 3 5.2 Tanker inspection

#### Petrol tanks

The General Directorate of the Palestinian Civil Defense is interested according to the regulation of prevention and safety for stations of petrol and transfer petrol tanks in examining all the tanks and vehicles that operate in gas and petrol transportation. There is a mechanism determined by the cooperation with the General Authority for Petroleum and the Ministry of Transport and Communications, as it is concerned with the General Authority for Petroleum of the safety of the tank and follow all the requirements contained in the regulation for factors of prevention and public safety. The Ministry of Transport and Communications specializes in load tests and tank design factors related to ease of movement<sup>13</sup>. Figure (5) shows the petrol calibration device in fixed tanks.



Figure (5) Calibration chamber and petrol vehicle during calibration. Source: researchers.

#### Gas tanks

The safety for gas stations and gas transportation tanks are examined by joint committees of the General Authority for Petroleum and the Ministry of Transport and Communications and Civil Defense. The Directorate General of Civil Defense concerned with the safety of tanks and public safety procedures and mechanisms of static discharge of cargo. The General Directorate of Petroleum is working on checking safety valves of the tanks, which is operating on the province of the pressure inside the tanks and safety valves down

the tanks, which self-closed in the event of a malfunction in the tank. Also, pressure and volume regulators are checked which are installed on the tank by The General Authority of Petroleum. The Ministry of Transport and Communications examines the load factors related to the design of the tank that facilitates its movement<sup>13</sup>.

### **3.5.3 Loading transfer tankers**

Tankers are filled with one type of petrol, whether diesel, gasoline, kerosene, gas or diesel for electricity generation plant in order to preserve the product and the implementation quality of the procedures of safety<sup>7</sup>.

### **3.6 Sixth Stage: Storage**

The stations of petrol and gas are prepared and organized with infrastructure according to the national laws and regulations. The safety and prevention measures are considered, where petrol tanks are placed underground, while gas tanks are located above the ground. The companies unload, store and transfer petrol and gas these tanks. Tanks of gasoline, diesel and kerosene are separated inside the stations and each distributor is a separated supplying point<sup>14</sup>.

### **3.7 Seventh Stage: Distribution and handling**

The distribution and handling of petrol and gas are conducted according to the place type and the procedures of work in the station. Generally the handling of petrol and gas in the stations given by external pumps that have outlets for petrol by electronic counters. New systems now operate using electronic cards, where the given quantity of the petrol withdrawn directly from the tank to the consumer, whether for vehicles or gas cylinders<sup>14</sup>.

### **3.8 Eighth Stage: Disposal of waste and spills**

Concerning gas, no waste present, while in case of the different types of petrol waste the liquid petrol withdrawn down to a height of 10-15 cm from the reservoir where some waste materials, water and solid impurities remain in this part of the tank. This residual part of the petrol withdrawn at intervals ranging from 6-12 months depending on the amount of stored petrol in the tank and is filtered in a special tank. The remaining deposited materials are burned in the incinerators<sup>14</sup>.

### **3.9 Entities operating in the oil and gas sector management**

The following institutions operate in this sector:

- 1- **General Authority of Petroleum- Gaza Office:** through the Department of Finance and the Department of crossings and departments of inspection and control.
- 2- **The General Directorate of Crossings and Borders:** It is responsible for following up the customs requirements and the movement of petrol transported from the crossing to the Gaza Strip, and facilitating the tasks and movement of Egyptian vehicles to transport petrol and gas to warehouses and stations.
- 3- **General Authority of Petroleum - Ramallah Office:** Through the Finance Department, which works to resolve the supply of funds from Gaza to the Ministry of Finance in Ramallah and then pay the price of petrol to Israeli companies.
- 4- **The Egyptian Petroleum Authority:** It is interested in supplying the required quantities of petrol according to requests submitted by the General Authority of Petroleum in Gaza.
- 5- **The Ministry of Transportation:** It is interested in the development and organization of the transporting vehicles of fuel, gas and gas distribution within the borders of the Gaza Strip.
- 6- **General Directorate of Civil Defense:** It is interested in following up all the requirements of prevention and public safety in accordance with the regulations adopted for gas stations and gas storage places and methods of handling, transportation and distribution.
- 7- **Central Committee for building and organizing cities:** It is specialized in the organization, distribution, planning and design requirements for gas and gas stations, which contributes to the reduction of risks and spread in the Gaza Strip.

The researchers found that there is a significant difference in the management of oil and gas sector between Karm Abu-Salem petrol crossing which has been established in 2009 after the closure of "Nahal Oz" crossing by the Israelite side, which was dedicated for supplying of petrol and gas and that of Rafah Petroleum crossing, which was established in 2018. Rafah crossing Petroleum was created in urgent circumstances after the establishment of petrol stores of about one million liters capacity in Salah Al-Din road between the governorates of Rafah and Khan Younis as a result of the increasing pressure and the need for the presence of a main store in the area that would be the core of business between Egypt and the Gaza Strip. The store was established near Rafah crossing, which designed and supervised by the General Authority of Petroleum Office in the Gaza Strip as it provides all the factors of safety. The store is characterized by ease of operation and maintenance



despite the blockade imposed on the Gaza Strip for more than 12 years which affected the provision of spare parts, contact parts, and equipment. The researchers noted during their field visit a great strain exerted on the petrol and gas companies in the importing of Israeli petrol and gas because of the complexity of the system discussed previously. In the case of the Egyptian petrol, the application is accompanied by transferring funds to the General Authority of Petroleum in Gaza to the Egyptian Commission of petroleum in order to receive the requested petrol quantity directly without difficulties. For the regulation and distribution of gas and gas stations, there is a need to re-examine the organization and distribution points of distribution of petrol and gas according to the density of urban and population and the need for growth and future development.

**3.10 Proposed model for safe management mechanisms for the petrol and gas sector in the Gaza Strip.**

**3.10.1 The system objectives:**

Development of the capabilities, skills and knowledge related to the safe management of transportation, handling and disposal of petrol and gas waste in the Gaza Strip.

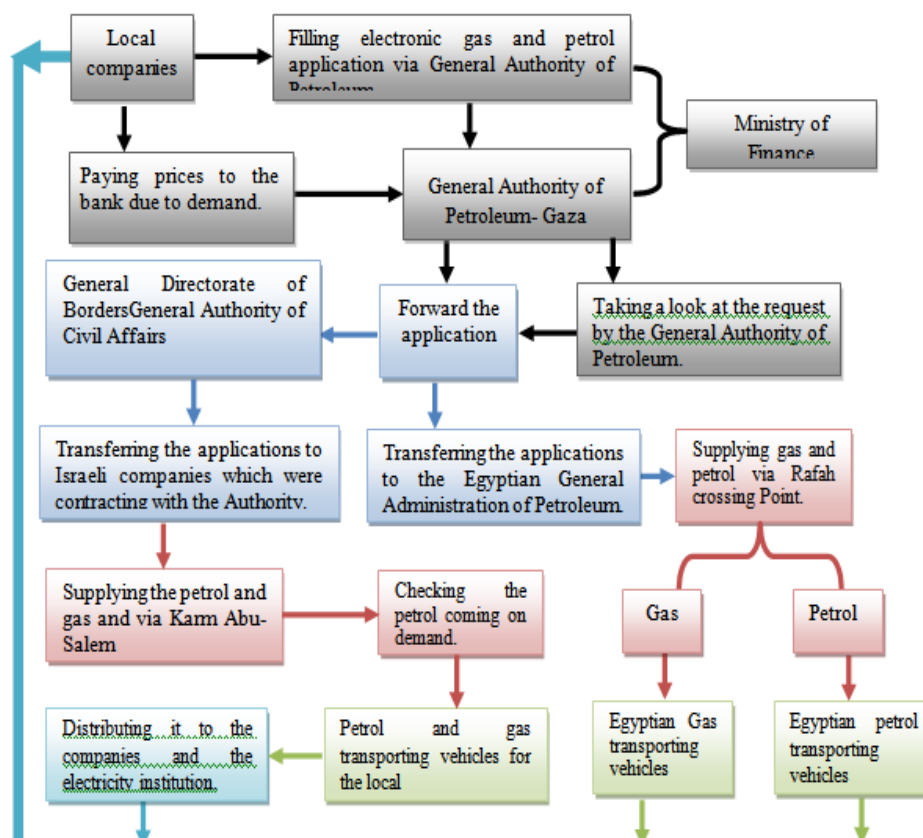
**3.10.2 Beneficiaries of the system:**

- The Palestinian government with all its institutional components.
- Owners of petrol and gas companies.
- Gas and Petrol Distributors Association.
- Workers in gas and gas stations
- Citizens and consumers of petrol and gas.

**3.10.3 Requirements for system success**

- Constitution of a national risk management committee.
- Preparing the national description of petrol and gas risks in the Gaza Strip.
- Preparing of national risk control manuals.
- Joining gas and gas stations to geographical distribution maps of civil defense stations.
- Preparing operational plans for periodic inspection of gas and gas stations and gas transport vehicles in the Gaza Strip.
- The participation of the relevant authorities in the management of the system as representatives of owners of gas and gas stations.

The proposed system is given in Figure 5.



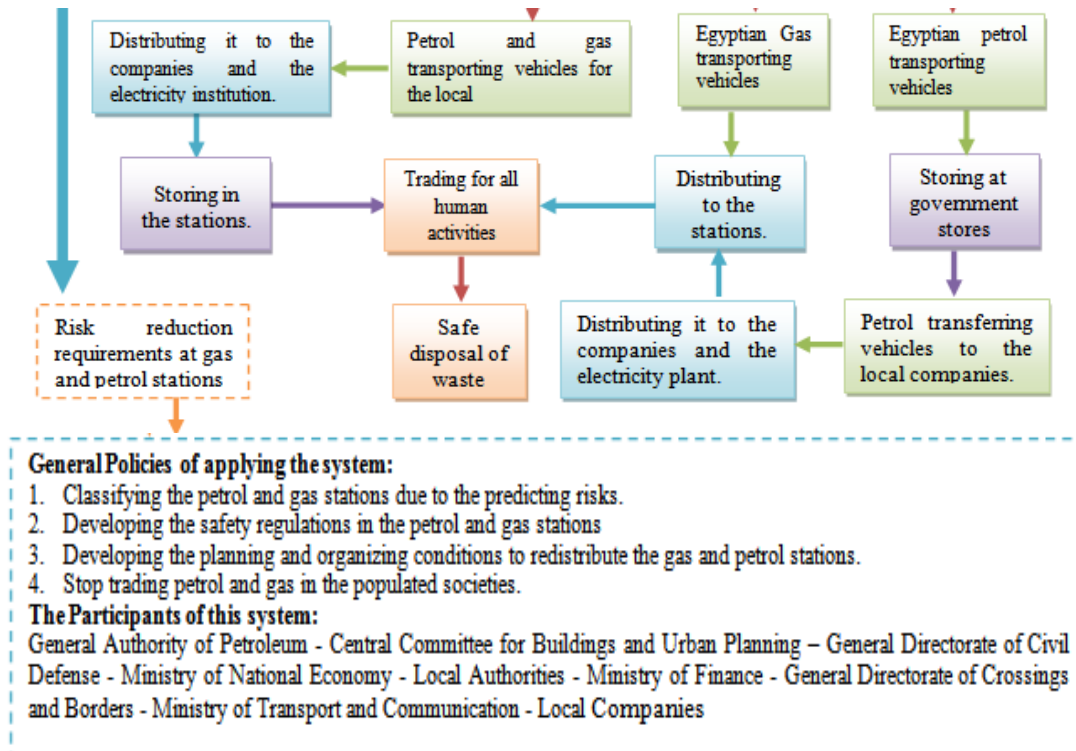


Figure 6: Proposed model for safe management mechanisms for the petrol and gas sector in the Gaza Strip.

#### IV. Conclusion and Recommendations

##### 4.1 Conclusion:

- There are laws and regulations governing the mechanism for the establishment of petrol and gas stations in the Gaza Strip and are working under the responsible authorities, such as: (Ministry of Local Government, the Central Committee of the Buildings and Urban Planning, Civil Defense, the General Authority of Petroleum, the Ministry of Transport and Communications, the Ministry of Labor, the Palestinian Ministry of Health, Ministry of National Economy and Environmental Quality Authority).
- The petrol and gas are managed by specialized staff of the General Authority of Petroleum, which includes crossing staff, follow-up, inspection staff, technical staff and licenses and crisis management staff
- Lack of interest in the training and rehabilitation of drivers from the risks of dealing with the transfer of petrol and gas in the Gaza Strip (driver rehabilitation program).
- There is full coordination between the office of the General Authority of Petroleum in Gaza and its office in Ramallah, where the required quantities are prepared in the Gaza office and transferred to the Ramallah office and then to the Israeli supplier company.
- The agreements between the Palestinian National Authority and the Israeli suppliers are unclear and non-binding and the specialists in the field are not familiar with or participate in the work of the General Authority of Petroleum in the Gaza Strip.
- There is full coordination between the office of the General Authority for Petroleum in Gaza and the Egyptian company supplying the Egyptian fuel, and there is clarity of all the mechanisms for the supply of petrol and gas.
- The shortage of petrol supplied by the Karm Abu-Salem crossing is compensated by petrol and gas from the Egyptian side, where all the petrol and gas needed by the Gaza Strip is provided.
- Discharge at the Karm Abu-Salem crossing is lacking for all security and safety factors, while at the Rafah oil crossing there are security and safety factors. There is an electronic system for operating fire extinguishing systems and early warning. It is carried out through long pipes of up to 500 meters. Directly reducing the amount of waste.
- The transportation and unloading of petroleum at gas stations is subject to continuous monitoring by the General Authority of Petroleum and by the inspection teams in all governorates.
- Petrol is filled after connecting the vehicles and trucks with the grounding cable to prevent the impact of static shipments at the Egyptian crossing. This prevents accidents caused by static electricity.
- Petrol tankers with extensions can be partially manufactured in the Gaza Strip. The car itself is supplied from abroad. Gas tankers are supplied from abroad and cannot be manufactured in the Gaza Strip.

- The companies have a significant stock of 10 million liters and are equipped according to the rules and regulations of the stores.
- The government has 3.5 million liters of oil at the Rafah oil terminal.
- There is no clear role for the Ministry of National Economy, especially the Department of Consumer Protection, where the General Authority of Petroleum determines the maximum price of the Liter of fuel, the price of gas cylinders of different sizes, and has nothing to do with determining the minimum price of petrol and gas and this contributes to the floating price and thus increasing competition between companies.

#### **4.2 Recommendations**

- Preparation of the national risk management manual for gas and gas stations.
- Increase the safety and prevention procedures at gas and gas stations outside the civil defense field according to geographical distribution by increasing the risk monitoring systems using the associated heat and smoke detectors in the early warning system. In addition, using the automatic fire extinguishing system and providing 500 liters of foam with a pump and a continuous water source of not less than 5000 liters linked to the automatic sprinkler system.
- Issuance of a system of dividing risk levels for petrol stations according to the range of geographical impact, the quality of the expected risk, and the scope of the impact of each risk.
- Consolidate all systems for the management of gas and gas stations between the two parts of the country.
- Civil defense should provide training programs for workers in gas and gas stations, as in the case of gas distributors.
- A system for granting a driver license for hazardous materials should be adopted as part of the program for the rehabilitation of motorists and petrol and gas tankers.
- Revise legislation and laws on safety distances between the gas stations themselves and gas and petrol stations, and between population buildings, buildings, gas stations and gas.
- Criminalize the indiscriminate handling of unloading and handling of petrol and gas in unallocated areas, which is characterized by a high level of risk.
- Tighten penalties for those who violate safety and safety measures at gas and gas stations, which have a significant impact on the lives of citizens in the Gaza Strip.
- Update the mechanical installations and electrical installations at the gas stations every 10 years at least, in order to prevent the leakage of petrol to the subsoil.
- Provide government concessions to companies that transport petrol and gas stations, according to the government's national vision for preventing the spread of petrol and gas stations randomly, especially the stations established before the issuance of Law No. (3) For the year (2000) for civil defense.
- Intensify the visits of gas and gas stations by the Civil Defense to at least two visits per year at least.
- Prevent the work of any citizen in gas and gas stations without obtaining a certified course of civil defense, and a work permit by the General Directorate of Petroleum and the General Directorate of Civil Defense and the Ministry of Labor.
- The necessity of activating the sanctions in the petrol transfer agreement on Israeli companies in violation of the conditions of supply under the pretext of security justification or weather factors.
- Developing the safety and safety system in the petrol store at the Karm Abu-Salem crossing.
- Pay attention to the procedures of prevention of static electric charges in all areas of petrol and gas trading.
- Laws and regulations related to the licensing and authorization of safety and quantities in gas and gas stations need to be updated according to modern scientific variables and demographic variables.

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