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EXPLORING DISTRIBUTION PROCESS AND CUSTOMER EXPERIENCE: THE CASE OF LIQUIFIED PETROLIUM GAS IN ADDIS ABABA

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EXPLORING DISTRIBUTION PROCESS AND CUSTOMER EXPERIENCE: THE CASE OF LIQUIFIED PETROLIUM GAS IN ADDIS ABABA

School of Business and Economics

Masters of Business Administration (Management)

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DECLARATION

I, the undersigned, declare that this research on the title "Exploring Distribution Process and Customer Experience: The case of Liquefied Petroleum gas In Addis Ababa" is my original work and has not been presented in any other university for fulfillment of a degree, and all resources used as a reference for the study have been properly acknowledged.

Declared by:

Name_____

Sign_____

Date_____

CERTIFICATION

This is to certify that the above declaration made by the candidate is correct to the best of my knowledge.

Confirmed by: Dr. Ethiopia Legesse (PhD) (Advisor)

Signature: _____ Date_____

Place and Date of Submission:

Addis Ababa University, School of Business and Economics May 2023

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At the end, I would like to give all my family members and close friends for their unlimited support and Advise. Thank you.

Hailu Ayalew Abdi

List of Abbreviations/Acronyms

LPG	Liquefied Petroleum Gas
WLPGA	World Liquefied Petroleum Gas Association
NOC	National oil Company Ethiopia
BCRM	Branded cylinder recirculation model
CCCM	Customer-controlled cylinder model
CX	Customer Experience
MT	Metric Ton

Table of content

List of figures

List of tables

ABSTRACT

Nations face distinct and significant issues in the quickly changing and expanding world, particularly countries that are developing, where energy needs are rising due to population expansion, economic progress, and individual fuel/energy consumption. Currently countries are looking for efficient, reliable, environmental friendly and cost effective source of energy for house hold consumption and for their industries. Even though LPG product is very sensitive, efficient and effective means of alternative source of energy in Ethiopia and Addis Ababa, it is rounded with a lots of challenges and hustles through availability and accessibility by participant bodies of the business and we can't get the fruit of competitive advantage of LPG product on the country economy and individuals energy's satisfaction levels. The purpose of this research paper is to explore distribution process and Customer Experiences on LPG business. Using Exploratory study approach data were collected from targeted populations that are Bulk Importers and Distributers, whole sellers, retailers and LPG customer's thorough interview as a primary source and related literatures as secondary sources. Those data were analyzed by qualitative case study methods. Using thematic analysis method discussion was made on the result using Microsoft word coding in to themes, the study identify major distribution process challenges and opportunities, customers experience on the field and propose the necessary remedies, suggestion to be taken for the effective distribution and usage of LPG.

Keywords*: Distribution process, Customer Experiences, challenges and opportunities*

CHAPTER 1

INTRODUCTION

Liquefied petroleum gas (LPG) is a type of fossil fuel. The phrase is frequently used to refer to the combination hydrocarbons propane (C3H8) and butane (C4H10). LPG can be created as a byproduct of the processing of crude oil, produced through refining petroleum or natural gas that is obtained from fuels. LPG is an odorless, colorless gas. (WLGPA, 2019, Statistical Review of Global LPG)

LPG is harmless and very efficient gas source of energy, which play significant role for replacing wood and charcoal consumption for urban households and different industries (reduction of forestry) and effective alternative for electricity usage. LPG is convenient to use and has a high energy density per volume Compared to methane from natural gas, its calorific value per unit volume is almost 2.5 times more. (Norad (Sep, 2020), Study on the Potential of Increased Use of LPG for Cooking in Developing Countries)

There are countless uses for liquefied petroleum gas as a fuel, including those related to trade, manufacturing, transportation, agriculture, energy production, catering, heating, and leisure activities. It is also one of the environmentally friendly (less hazardous) source of energy for households, restaurant, hotels, coffee roasters and different small, medium and high level industries.

The primary advantages of LPG in developing nations are in assisting people in shifting from a wasteful consumption of biomass to an environmentally friendly cooking fuel and industrial use. This has significant positive effects on health and helps prevent the 1.6 million deaths annually brought on by breathing problems by smoke and other chemical contaminants generated by improper combustion of biomass in tight places. (WLGPA (2019), Statistical Review of Global LPG)

LPG also helps to raise quality of living. LPG is regarded as the most practical and efficient energy alternative for both household and commercial use.

Ethiopia is not manufacturer of LPG gas but it imported a bulk amount from different countries through Sudanese, Djibouti and Kenyan boarders. It becomes one of major source of energy in the country economic activities, and currently the government gives special attention for these sector and listed as prior business field that gives first level Literal Currency offer in the newly revised national bank of Ethiopia strategies.

LPG can be classified in Ethiopia as a privately owned energy-driven business with enormous potential for job development and entrepreneurship that expands its operation from involvement in the downstream part of the value chain to upstream imports. Private, massive global and multinational firms are likewise

generally absent from the LPG market in emerging nations like Ethiopia. As a result, the industry in Ethiopia, and more especially Addis Ababa city, is relatively fragmented and is made up of numerous Smaller and primarily domestic enterprises.

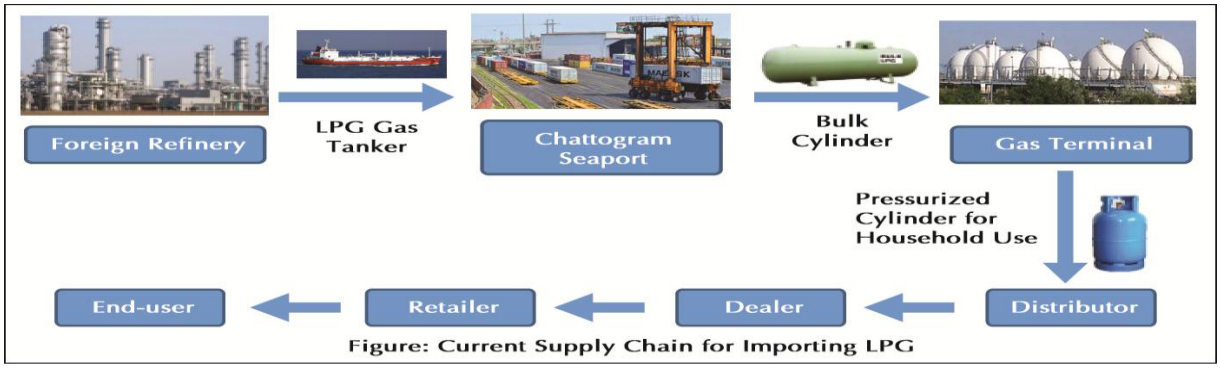

Figure 1 LPG supply chain

In 2015, there were more than 292 million metric tons of LPG produced year, compared to over 284 million metric tons consumed annually. According to data from the Global Economy, the average daily consumption of LPG in 2012 was 40.95 thousand barrels, from the European Calendar's 1986 to 2001. we can examine the provided data for Ethiopia, an average of 0.06 thousand barrels per day were used in Ethiopia over that time, with a lowest amount of 0 thousand barrels per day in 1986 and a peak of 0.2 thousand barrels per day in 2001 E.C. The most recent figure is 2,000 barrels per day, from 2001. For reference, the global average for 2014, calculated from data from 189 nations, is 20.98 thousand barrels per day. While we are considering the data received from Ethiopian Statistics agency released by the year 2011 the average consumption of Ethiopia was 19.4MT and out of these 3.28MT used by domestic use in Addis Ababa. Again In accordance with the data by the year 2016 the average consumption was 36.3MT and out of these 3.63MT usage belongs to Addis Ababa city domestic use. According to these data Ethiopia is categorized as one of the least users of LPG for economy.

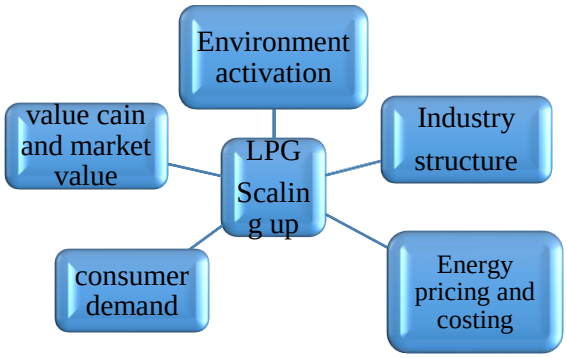

Fig: 2 Influential key dimensions and factors for the distribution of LPG

1.1 BACKGROUND OF THE STUDY

The need for energy has increased on a global scale. There are still three billion people in the globe who prepare meals with traditional fuels including coal, charcoal, and firewood. Africa is home to the majority of those without access to sustainable energy sources. Most of the countries in Africa, especially, Ethiopia tries to meet energy demand through electricity, But it has proven challenging to meet Addis Ababa's energy and electricity needs, particularly given the city's fast population growth and the high levels of poverty that make electricity prohibitively expensive. In such situations LPG becomes one of the potential alternative energy sources for Ethiopian Economy, since liquid petroleum gas (LPG) is becoming a significant energy source; it is frequently regarded as the most efficient and environmentally safe alternative to electricity.

Addis Ababa, the nation's capital and economic hub of Ethiopia, so far has been extremely limited use of LPG. Less than 1% of households in Addis Ababa use it, mostly in urban areas in combination with other fuels and industrial applications are quite rare. Other less advanced methods of cooking have a slow uptake. LPG was previously imported by the government, and its cost was similarly controlled to that of other petroleum fuels. The price of LPG, however, has not been regulated in recent years, and the private sector has also handled the fuel's importation and distribution. Only major cities may receive fuel distribution, and it is frequently faces interrupted supply and challenged with unpredictable price fluctuation.

Currently, there are around eight well-known LPG importers companies in Ethiopia. Ghion gas, NOC, Nile Petroleum, Total Gas, Wadi el-sundus petroleum Ltd. (WAS Ethiopia), Iran Merfic, Allied Energy (Safe gas), Modern gas and there are different newly emerged importers in the LPG business. Out of these Total gas already inactive for the last 3 years on the market, WAS and Iran Merfic also didn't import LPG for the last 4 years but gives storage depot service and filling service for other importers. Importation, storage, refilling, and dispatching are their main LPG operations.

The participatory bodies mentioned below play important roles in Ethiopia's overall distribution and supply of fuel.

Ports: currently Ethiopia is using Djibouti port, Sudan port and Kenyan port for importation of LPG gas

Importers and Bulk Distribution companies: These are authorized LPG product importers and that will distribute LPG product through their supply chain system, as they will address end user through their retail station or delivery based, or distribute to whole sellers and retailers.

National Oil Ethiopia (NOC): National Oil Ethiopia (NOC), which was founded in April 2004, is the primary indigenous large marketer of petroleum products. It has an extensive chain of contemporary service stations that are thoughtfully dispersed around the country. The commercialization of petroleum related goods in the nation is increasing significantly, according to National Oil Ethiopia Plc. With a remarkable safety track record, NOC is a market leader in the delivery of LPG to commercial and residential consumers. Numerous industries, including textile industry, healthcare facilities, hotel chains, university colleges, and households rely on NOC LPG Supply.

To satisfy the rising demand of the Ethiopian market, NOC is developing its LPG business by investing in new Storage and Cylinder filling Facility positioned at Dukem. In Ethiopia, NOC Service Stations, authorized dealers, and agents offer NOC Gas in cylinders of 12KG, 22KG, and 52KG weight.

Additionally, it offers expert assistance to Industrial LPG users with facility audits and inspections, safety training, and product handling. Customers can rent or buy LPG storage tanks from them depending on how much demand there is.

Ghion Gas: Sister company of THE GHIONS' is Ghion Gas. Ghion Gas has risen to the top among LPG suppliers as a thriving and well-known corporate entity. Ghion Gas has depot located at Dukem and has been established to Supply liquid petroleum gas in different sizes of cylinders with in size of between 3kg, 6kg, 12kg, 15kg, 22kg and 52kg for households end users, Hotels, Restaurants, Hospitals, and Industries. They also have a capacity to refill Bulk up to 60,000Kg. Its goods are offered at Ghion gas service stations, authorized distributors, and resellers with full LPG line installation and customer servicing across Ethiopia.

Ghion Gas has a vision of to become an Aspirational 1st choice Brand in the hearts of customers and stakeholders for alternative Green Energy solution provider in Ethiopia by 2030 and mission of To Relief the burden of women and Households for cooking and Industries for their business to flourish in order to create green environment and to available Liquefied Petroleum Gas (LPG) accessible for the society at affordable price.

Total gas: Total gas is French multinational integrated energy and Petroleum Company, which is a significant energy producer and marketer that operates in over 130 countries and supplies gasoline and natural gas. Total Ethiopia was founded in 1950 E.C as a distributor of TOTAL petroleum products, i.e. Fuel, lubricants, LPG and Bitumen. Total Ethiopia further increased its business by merging with Mobil Oil East Africa Limited Ethiopian branch at the end of 2006. Total Ethiopia is currently among the major oil companies in the country.

Operates Fuels and LPG Depot at Dukem. Depot designed to sustain approximately 10 days of Total Ethiopia's sales around the Addis Ababa region, which have a capacity of stores 100 tons of LPG, cylinder filling plant and Operates 143 Retail Network Stations. It's have been offer different sizes of cylinders with in size of 6kg, 12kg, 22kg and 52kg for households In the past there year's Total gas is not providing LPG for its customers.

NILE Ethiopia: Nile Petroleum Company is a major Sudanese Petroleum Products marketing CO founded in 1954 and start working in Ethiopia since 2008. It is participating widely different petroleum and LPG products. It have more than 100 tones capacity storage depot and filling plants at sululta. It offers its LPG product through different size cylinders in the range of 12kg and 50kg. Nile Ethiopia is one of the potential bulk LPG Importer and distribute to other bulk importers and distributers, and provides depot storage service for other companies.

Allied Energy: Allied Energy PLC by its branding name "SAFE GAS" is a private owned company that carries out unusual investments in a contemporary and secure manner by supplying LPG goods in 6kg, 12kg, and 50kg cylinders as well as 500kg, 1000kg, and 2000kg and above LPG bullet tankers at the demand of the customer. The Bullet LPG Tanks were initially introduced and installed in Ethiopia by Allied Energy PLC. Additionally, there is a bobtail LPG truck available to travel anywhere and replenish the LPG bullet tanks whenever it is suitable for the customer.

Iran Merfic: it is Iran based foreign company; previously it was participating in the Importing LPG and distribution of filled 50kg cylinders by the brand name 'IRAN gas'. Currently due to different political and economic sanctions it's not on the LPG product importing and distribution market. But it offers LPG depot storage and refilling service for other LPG distributing companies located at burayou town near Addis Ababa.

Modern gas: it is a private owned LPG importer and distributer company. According to the client's requirement, it offers its services and LPG products in 12 kg, 50 kg cylinders and larger LPG bullet tankers. Additionally, a bobtail LPG truck is available to replenish the LPG bullet tanks whenever and wherever the customer chooses.

Wadi el-sundus petroleum Ltd. (WAS Ethiopia) – Was petroleum co.ltd is established by foreign Sudanese investors. It offers LPG depot storage and refilling service for other LPG distributing companies located at Galan town near Addis Ababa. Previously it was participating in the Importing LPG and distribution of filled 12kg cylinders by the brand name 'WAS', but currently it gives only depot storage service for other distribution companies.

Whole sellers: Most of them are private owned distribution channels, they directly took LPG products from Distributers and deliver for either Retailers or their own end users (that are either medium industries, hotels, restaurants or households). Whole sellers may take sole agent from one Importer and distributer or may work with different importers and distributers from different brands in accordance with their marketing preference and financial strength.

Retailers They sell LPG to different small, restaurants, households and different potential customers. Most of them are storing and selling all brand Lpg suppliers to their customers and mostly get stock from different wholesalers and Distributers.

1.2 STATEMENT OF PROBLEM

Population growth projections for Ethiopia, among the nations with the quickest growth in the world both in Economy and population, as things currently stand Population growth projections for Ethiopia suggest that the population of the nation is anticipated to increase to 126 million by 2025, 140 million by 2030, and an astounding 190 million by 2050. (Ethiopia 2050, Feb, 2019 "Grand challenges and Opportunities). Following this economic and high population growth there is simultaneous high demand of Energy in all house hold consumption and industry level in Addis Ababa, which is highly populated and Economy center of Ethiopia. And these needs must be accommodated with the efficient supply of energy sources, effective accessibility and affordability of energy means.

The lack of modern and clean cooking fuels and technologies that characterizes the vast majority of houses in Ethiopia. These households rely on biomass energy, which comes in the form of wood fuels like firewood or charcoal, for their cooking and heating needs. These fuels are frequently obtained through the unethical logging of forests or the use of manufacturing techniques that are incredibly inefficient and they are used on outdated and inefficient cooking equipment.

Ethiopia confronts a significant difficulty when it comes to ensuring safe cooking, as 82% of the population still uses firewood as their main source of fuel for cooking, despite the fact that the bulk of the country (96%) still uses polluting fuels. There are 63,000 deaths annually in Ethiopia due to indoor home air pollution, which has been caused by ongoing use of these fuels, among other interconnected development difficulties. (MECS, Feb, 2022)

Ethiopian urban families employ a greater variety of cooking sources of energy, including electricity, kerosene, and charcoal, however the majorities (63%) still rely on firewood. More than 500,000 tons of wood, mostly as a mix of fuel wood and charcoal, as well as over 100,000 tons of animal waste, are used by households in Addis Ababa. (Asfaw & Demisse, 2012)

The incremental range of electricity payment by Ethiopian Electric Utility service tariff per kWh also becomes hustle for most of the users. By assuring effective and consistent distribution mechanism these source of energy can easily be replaced by LPG, which in turn result in reducing high level of deforestation, respiratory health problems and effective means of energy supply for both of household and industry ranges.

Currently end customers, households for cooking and different level industries as input raw materials for their productions are having difficulties with the availability and affordability of the LPG product and are forced to change their means of effective energy source or quite their manufacturing products. We all are

experiencing those effects on our daily life in terms of individual level and company wise. Such actions directly affect and have big impact on the overall economic activity of the city and Nationwide.

LPG is regarded as the most practical and efficient energy alternative for both household and commercial use. The demand among individuals and industries is significantly increased by its efficiency and ecologically friendly character. But as a result of price increases, an insufficient, prohibitively expensive, and delayed supply of LPG and other required materials as well as a lack of quality in customer care, single home LPG users and industries are currently experiencing issues. Considering this, these research paper will try to explore distribution processes and customer experiences in these areas of specialty to address and guide the smooth and consistent distribution process and customer experience.

1.3 RESEARCH QUESTIONS

- What are the end to end challenges and opportunities faced by distributers, whole sellers and retailers on the distribution of LPG product?
- What are the challenges and good aspects of LPG business from customer experience?
- What measurement should be taken by participant bodies (Importers and distributors, wholesalers and retailers, government bodies and customers) for effective distribution of LPG?

1.4 OBJECTIVE

1.4.1 General objective:

The general Objective of these study is to provide fact based knowledge regarding challenges and opportunities on distribution process by Importers (Bulk Distributers) companies, wholesalers and retailers, and Customers Experience on LPG industry.

1.4.2 Specific objectives:

Specifying the above main objective the research will look at the following specific objects

- To explore the main challenges faced on LPG business participants on the distribution process,
- To explore gap in availability and accessibility of LPG and LPG accessory materials, and the role of participant bodies on the LPG distribution Process,
- To explore the challenges, good side and opinion towards LPG service from the customers perspectives,
- To offer valid suggestions and remedy to be taken to overcome the distribution challenges and ensure customer Satisfaction on LPG business,

1.5 SCOPE OF THE STUDY

The major goal of the study is to explore distribution process by bulk distributers, wholesalers and retailers and customer experience on LPG business from stock to end user.

- The area of data collection is restricted in Addis Ababa only.
- The major concern areas of distribution is assessed from supplier, competitor, accessories materials, customer orientation and marketing strategy problems and governmental rules and regulations issues.
- Customer experience is overviewed from challenges and good service aspects from customer's perspective.
- The study explores present Distribution scenario of LPG industry.

1.6 SIGNIFICANCE OF THE STUDY

Currently countries are looking for efficient, reliable, environmental friendly and cost effective a source of energy for domestic use and for their industries. Liquefied petroleum gas (LPG) becomes one of the major and preferred energy sources for households and businesses.

Even though LPG product is very sensitive, efficient and effective means of alternative source of energy in Addis Ababa, it is rounded with a lots of challenges and hustles through availability and accessibility by participant bodies of the business and we can't get the fruit of competitive advantage of LPG product on the country economy and individuals energy's satisfaction levels. There has not been significant research works made, no one gives special attention on these business. Since the fundamental tenet of contemporary marketing is client satisfaction, an organization must synchronize its operations with the demands of the market, so customer experience regardless of LPG business must be highly sensitive issue to study. This business is all about a close relationship with the client, importers and distributers, whole sellers and retailers.

LPG shortages and unavailability are still a problem in Addis Ababa, which is one of the reasons why the proposed research aims to identify the distribution issues that are causing these problems and potential solutions to address them while ensuring the best possible customer experience.

1.7 LIMITATION OF STUDY

- The findings and suggestions are based on the information given by the respondents.
- The research study is bounded on Addis Ababa city only.

1.8 ORGANIZATION OF THE STUDY

This research paper is organized in to different Chapters. Chapter one covers introduction part which include background of the study, statement of the problem, research Questions, objective of the study with main and specific objective, scope of the study, significance of the study and limitation of the study. The next part is chapter two which will over view literature review on general background of LPG, Distribution meaning and the essence on LPG, overview of customer experience and on the context of LPG. The third part is chapter three which will elaborate the Methodology that will be used for the research by explaining Research Approach, research type, research design, data collection methods, population and the sample used and data analysis and technique used. In chapter four part result discussion and interpretation is presented. In the chapter five section summery, Suggestions and Future directions are presented. In the last part different questions raised for government bodies, importers and distributers, wholesalers and retailers and finally for customers and Quotations from respondents are attached.

CHAPTER 2

LITRATURE REVIEW

Theoretical Literature Review

2.1 Distribution

Distribution is the process of organizing, carrying out, and managing the physical flow of raw materials, finished items, and related information from points of origin to places of consumption in order to satisfactorily satisfy customers while making a profit. (Kotler and Armstrong, 2001)

The idea of distribution covers the location and manner in which goods and services will be made available for purchase, as well as all necessary mechanisms and logistical aids for the transfer of goods and services to clients. (Stern et al, 2006).

An effective marketing strategy makes certain that the intended product is disseminated in the desired quantity to the desired channel in order to please the desired consumer. (Kotler & Keller, 2009)

A strategic approach defined a distribution system as a chain of individuals, organizations, or agencies participated in the movement of a good to consumers, as well as the informational, financial, marketing, and other offers connected to making the good convenient and alluring to buy. (John O˝ Shaughnessy (1992))

Distribution presents a new frontier for competitive success, particularly if the major focus is on the creation and operation of outstanding marketing channel systems to provide first-rate client services. But creating the best promotional channel systems to increase sales, coming up with inventive dispatching plans, and operating the channel system successfully are not easy tasks. (Obaji, 2011)

A product must frequently transit through a number of intermediaries before it is used by the end user (such as wholesalers and retailers), each of which transfers the product to the following the supply chain or distribution channel is terms used to describe this process. Because "consumption is a function of availability...one can only consumes products that are available," channels are crucial. (Baker, M. J. (2014).

Retailers, wholesalers, and agents are examples of distribution channels, as well as direct distribution using a sales force or mail order. Distribution routes come in several levels and are not limited to tangible

goods. The simplest is the zero-level channel, in which the manufacturer and the end user communicate directly with no intermediaries present. These channels may be equally as crucial for getting a service from the provider to the customer.

2.1.1 Channel of distribution

A channel can be defined as a group of interconnected businesses engaged in the process of making a good or service available for use or consumption. (Stern, L, 1989)

A channel of distribution is a group of organizational units that work together to promote products, whether they are internal to the company or not. These functions all of which are persuasive include purchasing, selling, shipping, storing, grading, financing, taking on market risk, and supplying marketing data. A channel member is an individual company, group, institution, or government body that carries out one or more marketing duties and so actively participates in the distribution channel. (Lambert, 1978).

Channels of distribution can be viewed as social systems composed of a group of interdependent organisations that carry out all the functions (activities) required to convey a product from manufacturing to consumption. the chain of distribution (Stern & Neskett, 1969; Stern, 1971).

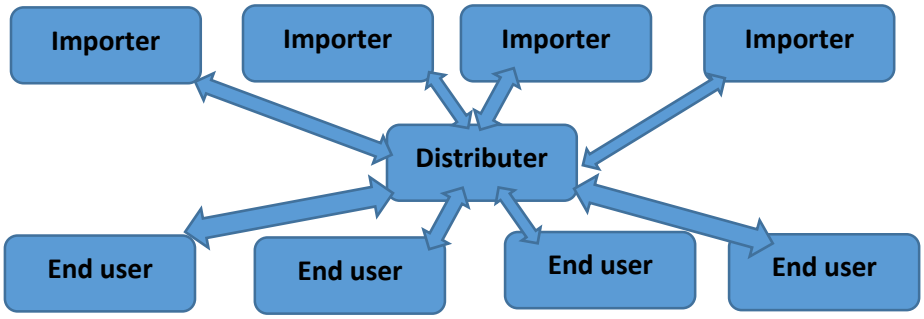

Fig 3: contacts with channels

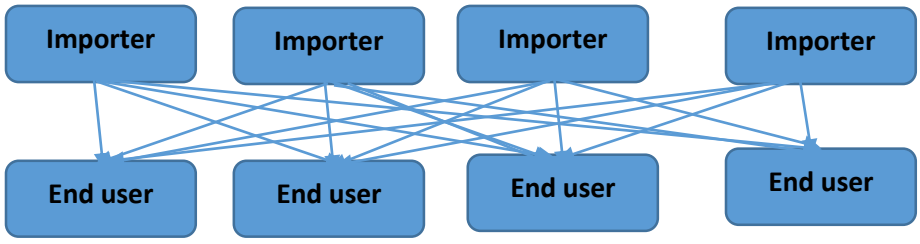

Fig 4: contacts without channels

To succeed in supply chain management, close communication and active information sharing are essential. Higher levels of channel management efficiency can only be attained through a two-way relationship. Channel integration is one relatively straightforward method of channel management. The supplier, for instance, may create a single, integrated system with wholesalers and retailers. Such a strategy might be used when one link in the chain owns the other components. Backwards integration occurs when a supplier owns its own retail locations, as is frequently the case, for instance, with a department store that has its own specialized gas importers. Franchise operations are another way to achieve integration. The managed marketing system is an alternate strategy where a member of the distribution chain that holds a dominant position makes advantage of that position. (Michael Czinkota, Demetris Vrontis, Masaaki Kotabe, Riad Shams, (August 2021), Distribution and Supply Chain Management.)

2.1.2 Physical Distribution

Physical distribution is the process of moving finished and raw goods from the site of production to the tale of consumption. (Bowersox 1969; Rogers & Leuschner 2004; Schary 1970: Wilson 1961).

Physical distribution activities will have an effect on how channels are organized as well as how channel relationships are managed throughout time. On the role of physical distribution operations within the broader field of channel management, more clarification is required. (Frazier, 2009).

Physical distribution, which was previously covered, includes a variety of supply chain tasks. The three main physical distribution domains of order processing, shipping, and warehousing are examined in this study.

Order processing

Order processing is defined as the communication signal that initiates the physical distribution process. (Croxton 2003:26.). The order processing function connects the warehouse to enable visibility of stock and transportation for the scheduling of deliveries. However, the information systems need to be interoperable with those of other channel participants in order to allow for the smooth flow of information. (Espino-Rodríguez & Rodríguez-Díaz 2014:12; Lau & Lee 2000:599).

Transportation

Transportation enables the physical movement of goods from one station to another, typically from the point of origin to its destination, and it becomes more useful when it crosses borders and continents.

Transportation involves activities like route planning, cargo tracking, and shipment notices. (Villarreal, Garcia & Rosas 2009:72)

Warehousing

Storing unfinished goods and raw materials is a warehouse's main purpose. Receiving, storage, order selection, accumulation, sorting, and shipment are the key tasks carried out in the warehouse. (GU, Goetschalckx & McGinnis 2010:540). When it comes to desired quantities and timing, the storage function triumphs over others. A business must determine the number, kind, and location of the warehouses it requires. The corporation can deliver goods to clients more swiftly the more warehouses it uses. However, more locations result in increased costs for warehousing. The business must consequently balance distribution expenses with the quality of client service. (Kotler, P. and Armstrong, G. (2001).

2.1.3 Channel Membership

The distribution chain's participants and potential channel structures are subject to some control by the supplier. At one extreme, in marketplaces for mass-produced consumer goods, the supplier's top priority can be to increase distribution levels so that a lot more retailers stock the product. On the other extreme, the supplier might be mostly worried about the caliber of each individual dealer when, for instance, dealers take on some of the supplier's responsibilities for supporting highly technical products or services. In general, distribution intensity has three different levels.

Intensive distribution Most retailers have the product in stock. The majority of convenience goods and, in particular, the market leaders in the consumer goods sector, employ this technique. Price competitiveness could be crucial in this situation.

Selective distribution, the product is exclusively sold by specially selected resellers, who are picked based on factors such as the reseller's reputation, geography, or other factors relevant to the product.

Exclusive distribution To guarantee that the product and following service offerings are effectively supported, only a small number of resellers (usually just one per geographic area) are permitted to sell the product. This distribution is most frequently employed for products that are exceptional, expensive, or complex, and when the resellers bring distinctive value to the product through their highly specialized activities and market expertise.

2.1.4 Monitoring Channels

Similar to how the organizations own sales and distribution operations need to be kept an eye on and regulated, the distribution chain's activities also must. Close cooperation and active information exchange

are necessary for "Supply Chain Management" effectiveness. Higher degrees of channel management efficiency are only possible through a two-way exchange of information. Channel integration is one extremely simple way that channels are managed. For instance, the provider and wholesalers and merchants might create a single integrated system. When one link in the chain owns the other components, such a strategy might be necessary.

Forward integration when a supplier controls its own retail locations, as is frequently the case with LPG distributors NOC stations.

Backward integration the method of channel management whereby the shop owns its own suppliers.

2.1.5 Retailing

Retailing is a range of activities where products and services are marketed to ultimate consumers for use in their homes or on their person. This is accomplished through retailing, which makes things widely accessible while selling them to customers in a limited way. (Amit & Kameshvari, 2012)

A related definition states that "retailing is all activities for selling goods or services directly to supreme buyers for their individual, non-business use." (Kotler and Armstrong)

Retailing represents the full range of activities that increase the value of goods and services sold to customers for use in their homes and on a personal basis (2013: 4). Therefore, retailing includes all of the operations involved in selling products to final consumers. (Aydın 2013)

Retailing is a socio-economic system that come up with for people together to exchange goods and services for a small consideration; that matches the needs of people, the ultimate consumers, with those of producers and farmers; and that not only satisfies the essential daily necessities of life but also promotes new lifestyles and resulting in peace. (Rudrabasavaraj, 2010)

The final gate in the delivery of goods for consumption by the final customers is thus regarded to be retail. Any business that sells products to the final consumer is performing the retailing function. Thus, it covers all transactions involving the direct sale of goods and services to consumers for their own, personal, or family use. The final phase of any economic activity is retail. (Arora, 2012)

Retailers are individuals or organizations that work in the retail industry. Brokers are individuals or organizations with a retailing-related line of work who take part in carrying out a retail activity in the marketing channel. (Aydın et al.2013)

Producers, wholesalers, and retailers all participate in the retailing process. However, "retailers, businesses whose sales come mainly from retailing" undertake the bulk of the retailing (Kotler and

Armstrong, 2012). "The retailer is a person, agent, agency, business, or organization that sends the goods or services to the final consumer." (Amit and Kameshvari, 2012)

Retailing Functions

People frequently mistakenly believe that retailing just involves the sale of things in physical stores, but in fact it also involves the sale of services.

There are several ways that retailing might be distinguished from other commercial operations. It has the following features. (Arora, 2012).

- Retail sales are typically in small unit sizes, there is direct end-user connection, and it is the sole point in the value chain that offers a platform for promotions.
- Location is crucial in the retail industry.
- There are more retail units than there are members of the other value chains, and services are typically as crucial to a retail organization as core items.

Even though practically all companies, manufacturers, wholesalers, and retailers—sell products to the public; retailing is mostly carried out by retailers because it is their line of work. For both consumers and producers as well as wholesalers, a retailer's role is crucial. Retailers serve a variety of marketing functions, including satisfying customer requirements, developing new product categories, gathering market data, and extending credit to customers, in addition to acting as buying specialists (agents) for clients and sales representatives for their suppliers. These establish connections between consumers and producers or wholesalers. (Mucuk, 2009).

Four utility ideas can be used to understand the retail economic foundations. ***(***Aydın et al.2013)

1. **Place utility** In general, things should be accessible where the customer selects..

2. **Time utility**: The retailer's responsibility is to be aware of when customers are looking for things because this is when they are more likely to do so.

3. **Ownership utility**: The utility of ownership is offered by the shop when selling to clients who have credit.

4. **Shape utility:** Numerous retailers alter the goods they sell. Sales are impacted by modifications made to products.

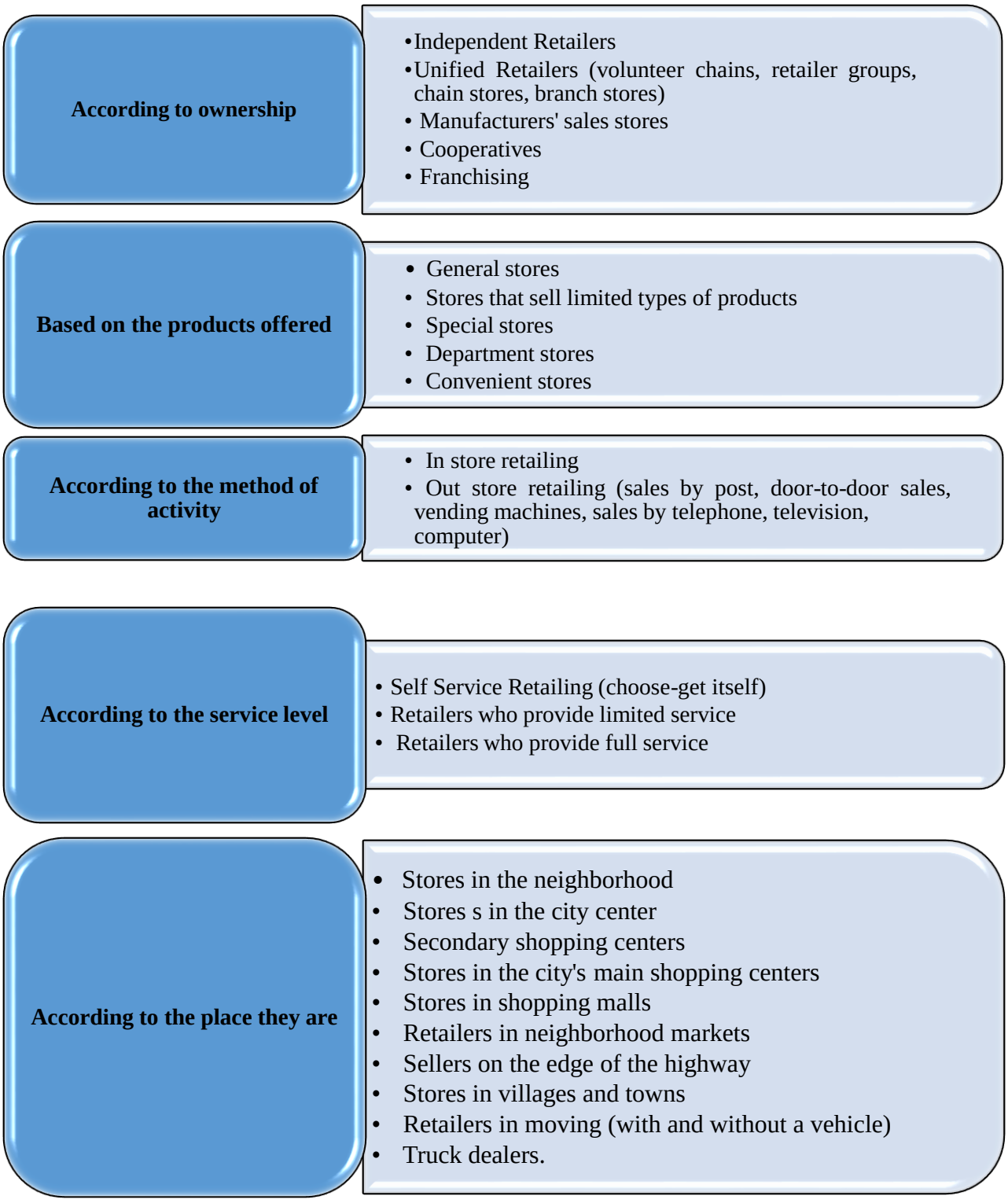

Fig 5: Summarized retailing types

2.1.6 Wholesaling

A layer of wholesalers, distributors, and agents could be positioned in between manufacturers and retailers. In order to connect the ends of the distribution chain, they serve as a link.

Retailers of services and wholesalers typically operate independently. They keep a variety of products on hand from various vendors and sell them either directly through their own sales team or through facilities designed solely as self-service cash-and-carry warehouses for merchants.

A distributor a wholesaler that works with industrial facilities and business-to-business marketing is known as a distributor. In terms of their interaction with the producer, agents and wholesalers are different.

Agents usually act as an official representative of one or more suppliers. They follow established business rules and quality standards while acting as an extension of a supplier, but they do not acquire ownership of the items. They receive a commission on their sales rather than generating money by reselling goods.

For wholesalers to thrive and survive, it's critical that they discover new approaches to enhancing the marketing process with competitive value. Without such value increases, suppliers and retailers alike would have a strong incentive to avoid the wholesale level. Using market-specific specialized knowledge, distribution procedures are often carried out more effectively to provide value. A wholesaler might provide better and more effective inventory control, better shipping or break-bulk services, more effective restocking procedures, more promotional help, or a wider range of complementary product offerings. To help with the organization and administration of retailers and suppliers, a wholesaler may, as an alternative, focus on information collecting. The functions will be performed by other channel members if wholesale intermediaries are unable to do so more effectively. (Distribution and Supply Chain Managemen, Michael Czinkota, Demetris Vrontis, Masaaki Kotabe, Riad Shams, August 2021)

2.2 Energy usage

The main factors influencing the demand for energy in developing countries are population expansion and economic development. Population growth is having a big impact on how much energy is being used, therefore as the population grows, more total energy is needed, and how much total energy is needed depends on how much energy is spent per person. (Sokona, 1997; Hadgu, 2002).

Urbanization is a significant element that influences how energy is consumed in emerging nations. The amount of residential energy usage rises as a place becomes more urbanized. Increases in income that come along with urban station may be present at this level as well. Although there is a transition from traditional to modern fuels in urban areas, the use of traditional fuels is still widespread in many urban regions of developing countries, particularly among low-income people. Additionally, people are consuming a variety of energy sources that are both traditional and modern fuels rather than switching to modern fuels. (Dzioubinski and Chipman, 1999; Reddy, 2004).

As a result, the quantity and kind of energy consumed in emerging nations is the main problem. Energy consumption in underdeveloped nations is significantly lower than in wealthy nations. For instance, poor nations consume nearly nine times less energy per person in their homes than wealthy nations do. On the other hand, a sizable portion of the energy in emerging nations comes from sources of biomass and conventional fuels such fuel wood. This illustrates how poorly quality or inefficiently efficient the energy consumed in developing nations is. (Dzioubinski & Chipman, 1999). The general rule is that the consumption pattern of energy in emerging countries is characterized by overconsumption of conventional energy sources such burning wood, and non woody biomass, on the other hand, the underuse of very effective contemporary fuels like coal, LPG, and natural gas. (Sokona, 1997).

In Ethiopia, households use roughly 91.3% of the country's total final energy, of which 98.5% comes from biomass fuels and 1.5% from modern fuels. The amount of energy consumed varies somewhat between rural and urban settings. In rural areas, households use 92% of the total energy available, 99.5% of which comes from traditional fuels and barely 0.5% from modern fuels. On the other hand, urban families only use 8% of the total energy, of which 86.7% comes from traditional fuels and 13.3% from contemporary fuels. (Woldegiorgis, 2002)

The type of energy sources utilized by households is influenced by a number of variables, with household income being the most important one. The amount of energy used and likelihood of using modern fuels tend to increase generally as household income increases. The socioeconomic class and educational level of the households are two other elements that define the pattern of energy consumption, as are the

likelihood of using contemporary fuels like electricity and LPG and the amount of energy consumed. (Sokona, 1997).

The main theoretical justification provided for household fuel choice is the "energy ladder" idea. "This concept has money as its driving force, and it entails a three part procedure. Households in the prior step that are distinguished by having low income levels rely heavily on biomass fuels including firewood, dung, and agricultural leftovers. The consequent step, sometimes known as the "transition" period, is when households with relatively higher earnings use fuels like kerosene, coal, and charcoal. Households use more expensive energy sources like electricity and LPG in the last stage due to the maximum revenue obtained. (Dzioubinski and Chipman, 1999)

2.2.1 Demographic factors and energy use

The most significant and promising demographic variables for research are those related to household size and composition, head of household age and gender, level of urbanization, and dwelling characteristics. Not just the energy usage per family, but also the energy use per person, is significantly influenced by household size. Another key factor affecting the variance in energy use among households is the age of the head of the household. The number of children, adults, the ratio of children to adults, and the sexes of household members make up the second indicator of energy use. The housing situation, which includes things like size, ownership, type, number of rooms, and construction materials, is another aspect in a home that might affect energy use. (O'Neil and Chen, 2002 ;)

In comparison to rural areas, "urban areas have been linked with high levels of energy usage by households and a larger percentage of consumption of cutting-edge fuels." (Dzioubinski and Chipman, 1999), Future energy use in emerging countries may be impacted by other demographic shifts like aging, the preference for nuclear families over wider families, late marriage age, increased divorce rates, and the tendency to live alone. This demonstrates that there are numerous ways in which demographic characteristics can affect how much energy a home uses.

2.2.2 Socio economic factors and energy use

The type of fuel selected and the amount used are both closely tied to income. Energy usage rises as income does, according to research. Lower income groups use more biomass fuels than middle- or high-income groups do in terms of fuel consumption. Although their proportion of modern fuels is rising in these economic brackets, biomass fuel consumption is still significant in developing countries (Reddy, 2002). The variance in the volume and type of fuel used may also be explained by one's employment situation and level of education. Assuming a greater employment status allows people to use cutting-edge

energy sources, there is a correlation between profession and energy use. (Reddy, 2002). Households with members who have higher levels of academic achievement are more probable to use modern fuels, while those with members who are illiterate or have lower levels of knowledge are more likely to use traditional fuels. (Mekonen, A and Köhlin, G .2008).

2.2.3 Other factors and energy use

The degree of energy efficiency depends on the availability, use, and end use of various types of appliances and energy sources. This has an indirect impact on the kind and volume of home energy needed. Another external issue that affects the supply side is the prospective, accessibility, and cost of energy sources. Choices, innovation, cost efficiency, subsidies, and access to energy sources are all impacted by energy policy. These non-economic factors for energy usage "appear through lifestyle, convenience, habits, restraints, habits choices, needs, control over and access to resources." (Mekonen, A., and Köhlin, G. 2008). Consider how various household groups' lifestyles and cultures differ in terms of their cooking and eating customs, flavors, and choices.

2.3 LPG (Liquefied Petroleum Gas)

2.3.1 History of LPG

In 1912, American scientist Dr. Walter Snelling noticed that liquid petroleum gases could be created from these gases and held under moderate pressure. This discovery led to the creation of liquid petroleum gases. Uses for LP-gas emerged between 1912 and 1920. The first LPG cook stove and automobile were created in 1912 and 1913, respectively. Sometime before World War I, the LPG industry was founded. An issue in the process of distributing natural gas appeared at that time. Facilities were gradually constructed to differentiate the gases that could be converted into liquids (such as propane and butane), cool, compress, and isolate the gases from the natural gas. In 1920, LPG began to be offered in stores. (Dr. A. Vinayagamoorthy, C. Sankarand M.Sangeetha, 2007).

2.3.2 LPG key characteristics

Liquefied petroleum gas is referred to by its acronym or abbreviated form, LPG. It is a non-renewable energy source like other fossil fuels are. Natural gas and crude oil are used to extract it. Hydrocarbons with three or four carbon atoms make up the majority of LPG's chemical makeup. Nearly three billion people utilize liquefied petroleum gas (LPG), a clean-burning and effective cooking fuel that is also known as propane, butane, bottled gas, or cooking gas in various other nations. So, propane (C_3H_8) and butane (C_4H_{10}) are LPG's main constituents.

LPG is created in a highly refined state as a by-product of the extraction of oil, natural gas, and petroleum. At air pressure and room temperature, LPG is a gas; but, by applying moderate pressure or by lowering the temperature sufficiently, it can become liquefied. It is a perfect energy source for a variety of uses since it can be readily condensed put together, kept, and used.

LPG may generally be distinguished from other energy sources by its clean burning characteristics, high energy content, and low Sulphur content. The characteristic scent of LPG is due to an odorant added to help detect leaks; LPG is non-toxic, colorless, and odorless (Bruce et al.2017). A steel tank, cylinder, or container is typically used to hold gas under pressure in liquid form. Commercial butane or commercial propane LPG, along with the temperature outdoors, will determine the type of pressure within the container.

Some of the container's pressure is released when we begin to use LPG. Later, a portion of the liquid LPG boils to create vapor. The process of vaporizing a liquid requires heat, or latent heat of vaporization. Boiling liquid absorbs thermal energy from the environment. This explains why it feels chilly to touch a container and why, in the case of a large off-take, water or ice may emerge on the container. When you cease using LPG, the pressure will stabilize at the temperature in the environment. Temperature changes the pressure of the LPG inside the container. It also needs to be managed because it is far higher than what the gadgets that use it require. This is accomplished by using a regulator, which restricts the pressure to fit the fueling equipment. The addition of foul-smelling mercaptan to a colorless and odorless gas makes it easier to spot leaks. (Dr. A. Vinayagamoorthy, C. Sankarand M.Sangeetha, 2007). Despite being non-toxic, LPG abuse can be quite harmful (much like with solvents). LPG must constantly be handled with care, and whenever possible, kept out of the reach of minors.

2.3.3 World Production and Consumption of LPG

LPG is largely utilized by industry and families for heating and cooking. In 2014, over 50% of the world's LPG consumption was in the residential sector. (WLPGA and Argus, 2015). As a result of the current global plenty of LPG and its production's recent growth rate of 3% to 4% per year, LPG availability has constantly outpaced use. The surplus of LPG production in 2014 was over 10 million tons, or 3.5% of the overall output. (WLPGA 2015; Argus). With a surplus of 10-15MT, the total amount of LPG produced worldwide in 2020 has already surpassed 300MT.

At the moment, LPG is produced throughout the entire world, with the top three producers being North America, the Middle East, and the Asia-Pacific region. LPG output is expected to continue growing, largely due to natural gas extraction, according to industry predictions. Africa produced 16 million tons of LPG in 2014, the majority of which came from Algeria (55%), Angola (13%), Egypt (10%), and Nigeria

(9%), while the region as a whole consumed 13 million tons. The Asia-Pacific area supplied 61 million tons, with China accounting for 41% of that total. India came in second with 12 percent, followed by Japan with 9%, South Korea with 5%, and Thailand with 3%. (Argus and WLPGA 2015, Bruce et al. 2017)

While taking them into account, Africa's LPG consumption is incredibly low on a global scale. However, recent data show that LPG is becoming more prevalent in a variety of new markets, particularly in less developed nations where it can play a significant role. Nigeria, with a projected consumption of 780,000 t/yr. led Sub-Saharan African growth at approximately 9%. The nation will probably be one of the first in sub-Saharan Africa to use more than 1 MT annually in the coming years. It is anticipated that additional key infrastructure developments, among others in Kenya and South Africa, will support this trend going forward. (Argus 2019)

Goals for greater or sole reliance on LPG consumption have already been established in numerous African Nations.

Table 1: LPG penetration targets of ECOWAS member countries

country	2015 Population (millions)	2015 GDP per capita (dollars)	% of population using solid fuels in 2013	LPG penetration target by 2030
Burkina Faso	18.1	589	95	68% in urban areas
Ghana	27.4	1,370	83	50% by 2020
Mali	17.6	724	> 95	62.5%
Niger	19.9	359	> 95	85% urban, 60% rural
Nigeria	182.2	2,640	75	80% for all clean fuels
Sierra Leone	6	5 653	> 95	25% for all clean fuels
Togo	7.3	560	95	75% for all clean fuels

Sources: World Bank (2015) provided data on per capita GDP; WHO (2013) provided survey-based data on the percentage of people who use solid fuels; Table: LPG penetration goals for a few central and eastern African nations

Table 2: LPG penetration targets of middle and east Africa countries

country	2015 Population (millions)	2015 GDP per capita (dollars)	% of population using solid fuels in 2013	LPG penetration target by 2030
Angola	25.0	4,101	54	100% by 2025
Cameroon	23.3	1,217	78	58%
Gabon	1.7	8,266	20	100% by 2025
Kenya	46.1	1,377	84	36%
Rwanda	11.6	697	> 95	25% LPG urban
Tanzania	53.5	879	> 95	> 75% access
Uganda	39.0	705	> 95	1 million housed

Sources: Per capita GDP statistics: World Bank (2015); percent of population using solid fuels: WHO (2013, survey-based data),

LPG supply demand balance

LPG is a by-product of the production of oil, natural gas, and oil refining that is produced in excess globally. On a national level, however, it is a limited resource because many nations must import LPG, which depletes their already depleted foreign capital reserves. The resource is available in oil-rich nations like Ghana and Nigeria, but investment in processing or refining facilities is required.

Since 1990, the number of people using solid fuels (such as biomass such as wood, charcoal, dung, or agricultural waste as well as coal) for cooking is still standing at roughly 2.8 billion due to population growth neutralizing positive developments in the majority of low-income countries where the switch to modern fuels has been slow. Although it started at an extremely modest level, population growth in Sub-Saharan Africa has partially offset the region's significant LPG development.

2.3.4 Increased uptake of LPG in developing countries and Contribution to environment and health

Health impacts: 3.1 billion People, or 53% of those living in LMICs, as well as 43% of all people worldwide, cook with hazardous fuels. The percentage of households that rely largely on polluting fuels for cooking varies greatly by region, with the African, South-East Asian, and Western Pacific Regions possessing by far the largest percentages (WHO 2016). According to current scientific knowledge, direct exposure to biomass cooking smoke causes between 2.2 and 3.8 million extra deaths annually, accounting for between 3.9% and 6.4% of all deaths worldwide. As a result, air pollution (both household and ambient) is the leading environmental cause of disease worldwide, accounting for about 500,000 of all deaths. (Goldemberg et al. (2018)).

The cost of the 5.5 million premature mortality related to air pollution in 2013 is being estimated in a collaborative study from the World Bank and the Institute for Health Metrics and Evaluation (IHME) from 2016.

The benefits of switching from conventional forms to clean fuels and technologies include improved health as well as the financial costs associated with these premature deaths, which should further support the need for action.

Emission level from LPG

Carbon dioxide is released into the environment through the combustion of fuels based on petroleum as well as solid biomass fuels. LPG has a negligible environmental impact, releasing insignificant levels of black carbon and other temporary toxins that contribute to global warming, and its CO2-e emissions are several orders of scale lower than those of kerosene and solid biomass fuels, regardless of how renewable the fuels are. (2017) Van Leuween et al. Domestic solid biomass fuel consumption in Asia and Africa is responsible for 60 to 80% of global black carbon emissions. More than one gigaton of CO2-e, or nearly 2% of all world emissions, is added to the carbon budget each year as a result of burning wood fuels.

Burning wood fuels results in an annual addition to the carbon balance of all global emissions. The potential to reduce greenhouse gas emissions by switching from wood to LPG as a fuel. The model estimates that instead of 400 kilograms of wood used annually for cooking, 43 kg of LPG is needed instead. (WLPGA (2019)).

Contribution to reduced deforestation

Africa was the only part of the world where the rate of deforestation increased during the global drop in deforestation from 2010 to 2020. Dar es Salaam alone in Tanzania consumes more than 500,000 tons of charcoal annually, which is equal to half of the national consumption (World Bank 2015). Between 1995 and 2010, Tanzania lost roughly 373,000 Ha of forest every year. Although clearing new land for agriculture and other human activities is a major cause of this forest loss, replacing biomass with LPG could help to reduce it. The example demonstrates how Dar es Salaam might conserve around 10,000 Ha of forest annually by replacing 250 000 tons of charcoal with 80,556 tons of LPG.

By extending the example, it can be said that Tanzania's annual total consumption of more than 145000 tons of LPG substitutes the equivalent of 18000 ha of forest in terms of cooking energy. (Norad, Sep 2020, Study on the Potential of Increased Use of LPG for Cooking in Developing Countries.)

The information is adequate to draw the conclusion that LPG should be a part of the answer since it is neat, profitable, and workable in the medium term at least in areas that are rather densely populated.

2.3.5 Energy usage in Ethiopia

Ethiopia's energy sector shares a notable characteristic with the majority of sub-Saharan countries in that it heavily relies on biomass, including wood, charcoal, crop waste, and animal feces. The majority of the nation's energy needs are covered by biomass sources. A report on the most recent national energy balance, the residential sector utilized 90% of all energy in 2014, and biomass accounted for 89% of the final energy supply. (Ethiopia National Energy Balance, 2014, Review of National Energy Mix) However, the growth of demand for fossil fuels and power is greater than that for biomass fuels.

Nearly all of the biomass energy utilized is consumed by households, whereas the transportation sector consumes the majority of fossil fuels and electricity is used roughly equally by families, businesses, and industries.

Household Characteristics

House hold	National (Million)	Urban (Million)	Rural (Million)
population	104M	10M	94M
Number of house holds	19M	2M	17M

Table: 3 house hold data (source Fraym (July, 2021), 'Ethiopia Consumer Segmentation.')

	National	Urban	Rural
Average monthly spending on charcoal (Birr)[3]	100	110	80
Average monthly spending on kerosene (Birr)[3]	30	40	20
Average monthly spending on wood (Birr)[3]	110	100	130
Average total monthly spending (Birr)[3]	2,000	2,600	1,800

Table: 4 House hold Expenditure in Energy Use: Fraym (July, 2021), 'Ethiopia Consumer Segmentation.'

2.3.6 The LPG situation in Ethiopia

Less than 1% of households in Ethiopia have used LPG up to this point; they mostly do so in metropolitan areas and in conjunction with other fuels. Other more advanced culinary techniques have a slow uptake. According to a recent CSA survey, barely 10% of homes utilize energy-efficient stoves (for baking), and adoption of other contemporary and clean cook stoves is far below 10%. Less than 6% of people in rural regions and less than 3% of people in urban areas use improved, clean cook stoves, and more than 80% of them rely exclusively on biomass fuels. Less than 20,000 homes in Ethiopia use advanced biofuels in the

form of biogas and ethanol. (Study on the Potential of Increased Use of LPG for Cooking in Developing Countries – Ethiopia, Sep 2020)

According to the International Energy Agency's (IEA) "African Case" for Ethiopia in their Africa Energy Outlook (2019), LPG could account for 9% of the mix. In 2030 (Norad, Sep 2020, Study on the Potential of Increased Use of LPG for Cooking in Developing Countries.)

Household energy use

Only 6 percent of household's nationwide use clean cooking fuel, with electricity being the most common.

	National	Urban	Rural
Primarily use clean cooking fuel	6%	23%	1%
Primarily use LPG to cook	**<1%**	**<1%**	**<1%**
Primarily use natural gas or biogas to cook	<1%	<1%	<1%
Primarily use electricity to cook	6%	21%	0%
Primarily use wood to cook	74%	40%	85%
Primarily use charcoal to cook	10%	32%	2%
Primarily use kerosene to cook	1%	2%	<1%

Table: 5 primary usage of energy (source Fraym (July, 2021), 'Ethiopia Consumer Segmentation.')

Cooking Fuels in Ethiopia

According to the 2018 Multi-Tiered Framework (MTF) survey, 13 percent of households use clean cooking fuels at least once throughout the year.

	% usage		
Use clean cooking fuel at least once a year	13%	44%	5%
Use LPG, natural gas, or biogas to cook at least once a year	4%	3%	4%
Use electricity to cook at least once a year	9%	41%	<1%
Use wood to cook at least once a year	89%	58%	97%
Use charcoal to cook at least once a year	30%	86%	16%
Use kerosene to cook at least once a year	1%	3%	<1%
Use a stone/fire stove at least once a year	74%	44%	82%
Use another self-built stove at least once a year	24%	17%	26%

Use a manufactured stove at least once a year	23%	72%	10%

Table: 6 energy source type usage in a year (source Fraym (July, 2021), 'Ethiopia Consumer Segmentation.')

N.B The approximately 1 million homes who cook with clean fuels are located in Addis Ababa and primarily utilize electricity. Additionally, 5% of them cook mostly with LPG.

Market regulation and structure as well as government policies and action

LPG now has almost no market (at least not on a national scale), and if it is utilized in metropolitan areas, it is typically used in conjunction with alternative stoves or electricity due to the accessibility of various sources of energy.

LPG used to be acquired by the government, and like other petroleum fuels, its price was similarly regulated. The price of LPG, however, has not been regulated in recent years, and the private sector has also handled the fuel's importation and distribution. Only major cities are allowed to distribute the fuel, and supply disruptions are common. Due to its high cost, LPG is typically only utilized by homes with high incomes. (Norad, Sep 2020, Study on the Potential of Increased Use of LPG for Cooking in Developing Countries)

However, the government doesn't have any specific goals or objectives for LPG. As was already indicated, the growth of electricity has outpaced that of LPG, and it is thought to have replaced a sizeable portion of the biomass energy utilized in urban areas for baking and cooking. Given that the Ethiopian government wants to electrify everyone, electricity seems to be the preferred option for substituting biomass in cooking. (Norad, Sep 2020, Study on the Potential of Increased Use of LPG for Cooking in Developing Countries)

2.3.7 LPG Distribution challenges and opportunities

LPG cylinder supply network management business, the distributors' and retailers' lack of a safety culture, Lack of awareness of conducting business in good faith among wholesalers and businesses the unmotivated executive's misconduct, customary bureaucratic delays by several government agencies, The existing LPG infrastructure at Bangladeshi ports is insufficient to meet current demand, pricing strategy (LPG station licensing process, transportation, relevant facilities concealed cost), regulations, inadequate necessary supply chain development, lack of future needs, lack of expertise and technological proficiency, uncertain assessment of futuristic demand growth and scopes for use in industry and the transport interaction sector. (Dominic Essuman, Stephen Asamoah, and Jonathan Annan (PhD), (July, 2014) the Challenges in the Supply of LPG in Urban Communities: The Case of Kumasi Metropolis (Ghana))

The industry's stringent restrictions were found to be the main problems affecting their functioning. Operators have additional difficulties due to frequent supply shortages. Poor transportation infrastructure that frequently results in vehicle breakdowns, varying demand, and lead times also have an impact on forecasting in the sector. They are unable to improve doorstep delivery due to a lack of logistical support, such as trucks. LPG is frequently in short supply throughout the nation, and operators face several operational and infrastructural difficulties. These problems lead to inefficiencies in the channel members' activities and aggravate the situation of consumers. (Dominic Essuman, Stephen Asamoah, and Jonathan Annan (PhD), (July, 2014) the Challenges in the Supply of LPG in Urban Communities: The Case of Kumasi Metropolis (Ghana))

Lack of efficient LPG safety education, escalating prices for LPG and its supplementary products rise in unlicensed LPG-powered automobiles, The main issues outlined by Eric Broni in the study publication include lack of accessibility to LPG, scarcity of LPG, lack of availability to LPG, and high risk of transporting LPG. ("The Ghana Liquefied Petroleum Gas (2018) Promotion Programme: Opportunities, Challenges and the Way Forward",)

2.3.8 LPG supply chain structure in Ethiopia

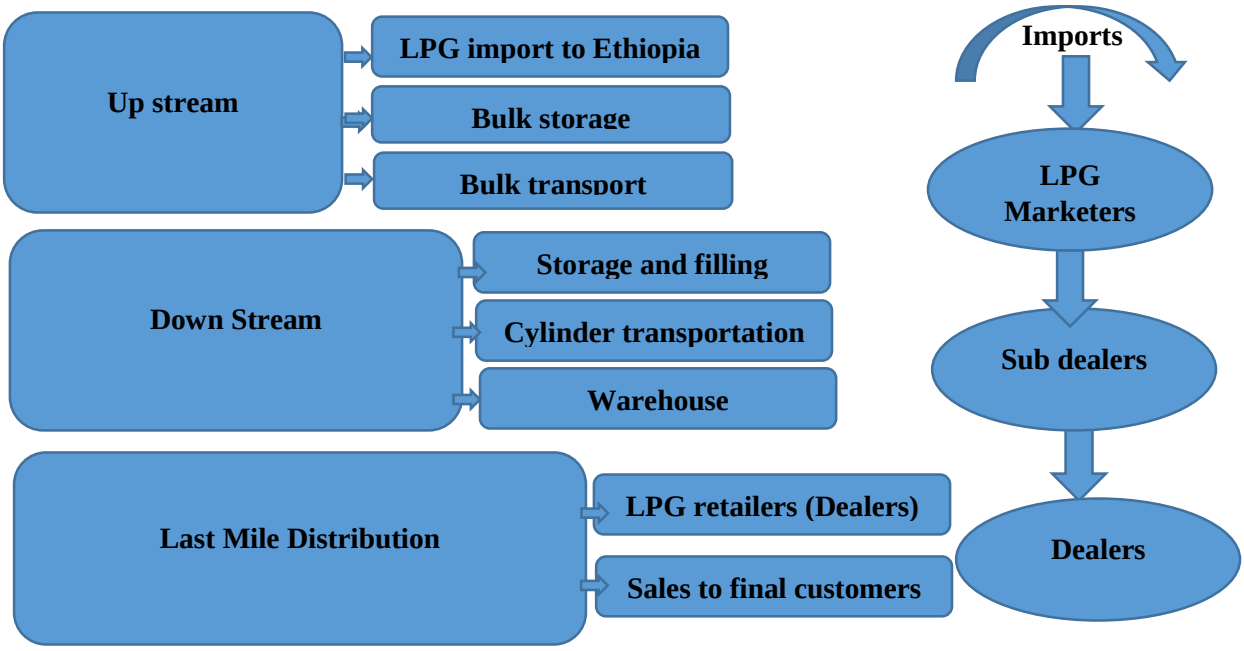

Fig 6: Supply chain structure in Ethiopia**:** Source: Clean cooking alliance: (2021)

2.4 LPG Cylinder Distribution Channel

Although they are made for tough handling, cylinders experience wear and tear and occasionally even damage when they are filled, packed, and sent through the delivery system to the consumer. Thus, it is crucial that cylinders be inspected, maintained, occasionally repaired and painted, and when necessary, re-qualified before being refilled. At an authorized filling plant facility, only qualified staff members are capable of performing this.

2.4.1 LPG Cylinder Distribution Channel Business Models

LPG cylinder distribution is a complicated process with numerous stakeholders and actors. The level of control begins to wane as the cylinder leaves the filling facility. The nature of the company necessitates effective cylinder control. Employing cylinder management procedures will provide LPG firms control over their expenditures and enable them to effectively assume accountability for cylinder security.

As the business models work on the distribution channels, two important concerns are "Who owns the cylinder?" and "Who is in charge of cylinder maintenance?"

There are two models for primary cylinder distribution. the most trustworthy branded cylinder recirculation model (BCRM), In this approach, clients swap empty, branded LPG cylinders for a new cylinder of the same brand, and the vacant one is returned to the marketer. Most distributors provide empty cylinders on a deposit basis for their channels, supply chains, and end users. It guarantees that refilling is carried out correctly and that cylinders are kept secure, maintained throughout time, and disposed of properly after their useful lives have ended. Additionally, under the "customer-controlled cylinder model" (CCCM), which lacks clear guidelines and obligations for consumers to properly maintain their cylinders, cylinders in use are more likely to become dangerous.

In addition, the BCRM requires users to make a cash deposit that is refundable, typically less than the cylinder's real cost. Both end-users who acquire cylinders and LPG distributors, who are duly appointed marketers' agents, make a refundable cash deposit to their cylinder supplier. Each participant has a monetary incentive to monitor cylinders, which reduces the likelihood that cylinders will be diverted to illicit or dangerous distribution and refilling activities. When an end-user no longer requires a specific cylinder, they can return it to an approved retail location for a deposit refund or swap it for a different cylinder type or size. Customers in the CCCM, however, are not given a deposit reimbursement, thus they may potentially destroy obsolete or unnecessary cylinders. But abandoned cylinders can be hazardous. (Scaling LPG for cooking in Developing Market, 2019)

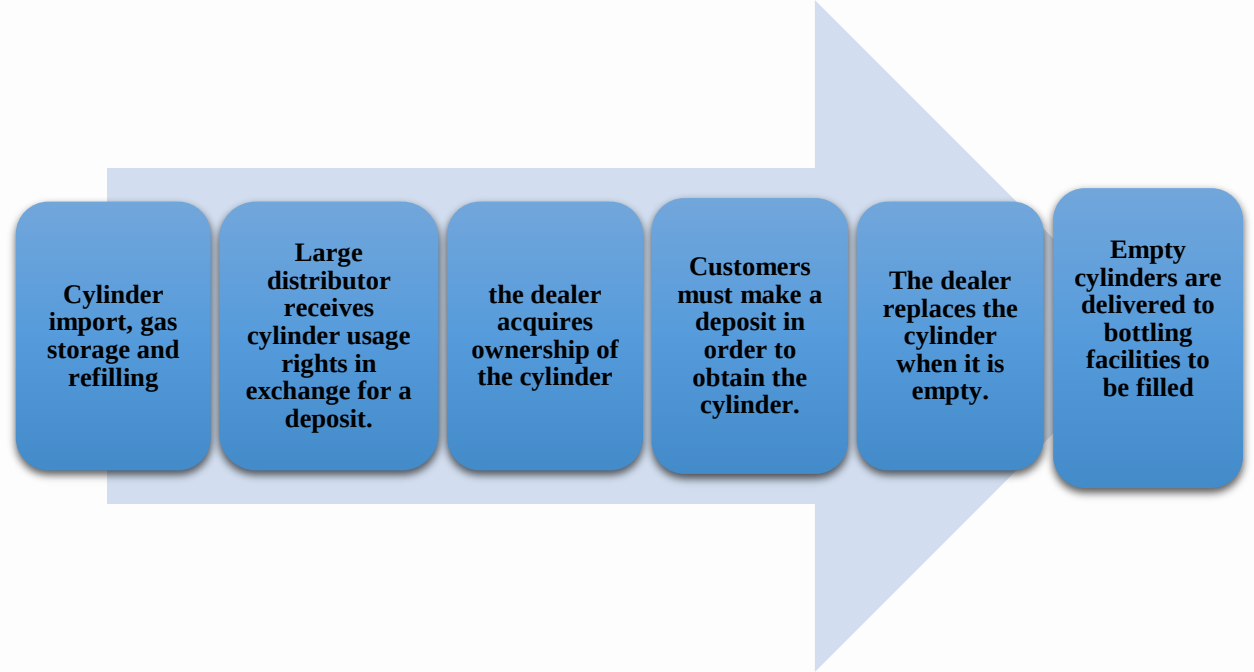

Fig: 7 Typical Cylinder Journey under the Branded Cylinder Recirculation Mode

2.4.2 LPG Cylinder ownership

1. Company owned cylinders

According to this concept, the business is in charge of the cylinder asset. Therefore, it's crucial that the cylinder goes back to the filling facility so that it can be examined, maintained, and, if necessary, fixed and requalifies.

The consumer may be required to put down a deposit when the cylinder is given in order to maintain control over ownership and guarantee that it is always brought back to the filling station when it needs to be refilled. We can see businesses that follow these situations, such as Allied Energy (safe gas) and Modern Gas.

2. Customer owned cylinders

Distributors will offer LPG cylinders for permanent sale when using the customer-owned model. The exchange distribution model, in which a consumer exchanges a cylinder that is empty for a full one at an outlet store, does let the cylinders to be sent to the filling plant for the necessary inspection and upkeep. A small bulk tank on a retail store or a portable filling facility may be used at a decanting plant to refill the customer-owned cylinder. With little or no servicing being performed on the cylinder, the problem with home and the decanting facility.

Always bring the empty cylinders back to a filling facility so they can be properly cleaned and prepared for refilling. The majority of wholesalers and retailers in this area employ such scenarios as Ghion gas, NOC gas, Nile gas, and so forth.

Cylinders in Retail Outlets

Regarding the method of distribution for retail outlet, we often have two scenarios, and the third one is based on the fusion of the two scenarios.

LPG cylinders can either be delivered to the customer's home via a home delivery service or the customer can pick them up from a retail location.

Direct Distribution

LPG providers have the option to handle the distribution of cylinders to their clients on their own. Controlling the distribution chain and having contact with clients directly are advantages of this approach. The best examples of such operations are Allied Energy and modern gas.

Indirect Distribution

In many cases, contractual agreements with distributors and dealers are used to supply cylinders to clients. It should be noted that the only branded contract the LPG supplier has with the external distributors and dealers is crucial.

Home Delivery for LPG Gas

Home delivery of LPG cylinders is thus extremely frequent in the residential LPG industry, as well as in cafés and restaurants, and among the companies' potential clients.

Orders are normally placed at a single, by the LPG company-managed customer support center. The deliveryman (or lady), who carries the full LPG cylinder or bulk gas for the installed tanker to the customer's door, then dispatches the cylinder to them. The empty cylinder is taken out, the full one is put in, and inspections are made. The procedure will depend on the LPG Company's business strategy. The chance to interact with the consumer directly is one benefit of home delivery.

Customer Collects The customer is in charge of picking up the entire cylinder and transporting it back to their residence for installation. When a customer picks up a cylinder through a swap system, they are in charge of carrying the cylinders to and from the retail location as well as removing and reconnecting them.

2.5 Customer Experience

Customer experience is defined as "the subjective reaction of the customer to the totality of direct and indirect encounters with the organization, including but not limited to the interaction encounter, the support encounter, and the amount of use encounter." (Lemke et.al. (20110)).

Customer's feelings during the purchasing process are influenced by the services provided by the store, the atmosphere of the store, the price of the goods, and its quality. (Zhao and Deng (2020))

As the sum of the feelings opinions, and views formed throughout the decision-making and consumption chain, which implies an integrated series of relationships with people, things, processes, and environment. (Pine and Gilmore (1998))

The customer experience is the result of a series of reactions that are sparked by a customer's encounters with a product, a business, or a component of its organization. The customer's involvement at several levels (intellectual, empathetic, sensory, physical, and spiritual) is implied by this experience, which is strictly individual. (Gentile et al. (2007))

The private and personal response that occurs when customers interact with a business, whether it be directly or indirectly, the customer typically initiates direct contact during the course of a purchase, use, or service. Indirect contact, which can take the form of referrals from others or complaints, promotion, news reports, and reviews, typically comprises unplanned meetings with agents of a company's products, services, or brands. (Meyer and Schwager (2007))

One of the most crucial elements in maintaining a firm's edge among competitors is customer experience (CX). Customers have more sway over businesses and can validate them through, for example, websites or social networks. Customers are searching for unique and vivid experiences that go along with the distribution of systems, goods, and offerings as they are more knowledgeable about the products, services, rivals, and prices of businesses. The relationship between businesses and consumers develops through time, starting with a potential customer's initial awareness and continuing through their buying journey and ending with their use of the product or service. (Pine, JJ; Gilmore, J)

The phrase "customer experience" refers to a broad notion that involves both customers and businesses. It also refers to the physical and psychological reactions that customers have when using products, systems, and services. Each stage that the customer goes through is when this happens. (Laming, C. & Mason, K., Customer experience). Customer experience is a subjective concept because it includes opinions from customers up until the post-consumption stage. To clarify the role of the customer experience, all of the

stages the customer goes through must be taken into account, in addition to the various types of experiences that come along with interactions with a service provider at various touch points.

Customer experience (CX) is the term used to describe how a company interacts with its clients at each stage of the purchasing process, including marketing, sales, customer support, and everything in between. It consists largely of all of a customer's encounters with the company you run.

Why customer experience matters?

Customers differentiate primarily on their interactions with your organization rather than particular item features and functionalities as items become increasingly commoditized.

Customers desire a personal connection with their favorite brands as well as recognition and respect from the businesses they do business with. Businesses must make confident that their CX strategies can provide individualized, pleasant encounters at every consumer touch point because CX has emerged as the key competitive distinction. Your customers' entire perspective and opinion of your brand are impacted by these interactions.

Good and Bad Customer Experience

A good client experience can be distinguished from a negative one. In contrast to a poor customer experience, which can leave a consumer feeling unsatisfied, disappointed, or even frustrated, a positive customer experience leaves customers feeling satisfied and joyful after every engagement. Negative customer experiences frequently result from clients feeling that you don't know them don't understand them, don't care to, or that you're challenging to do business with.

How to improve customer experience

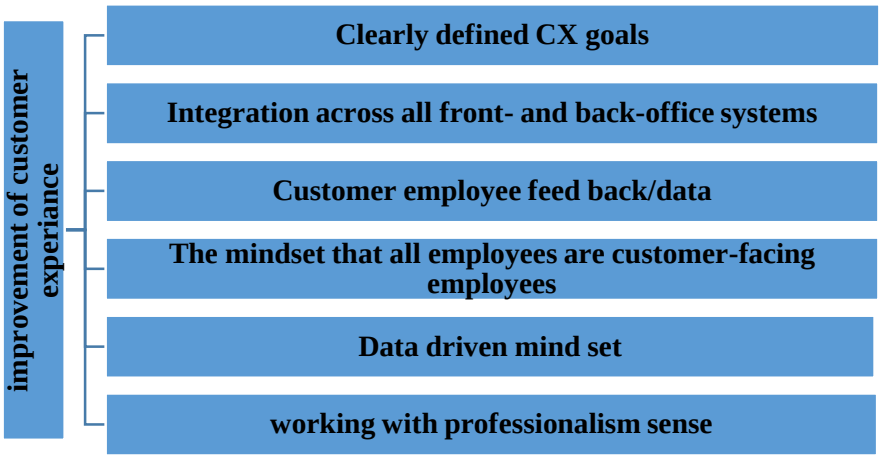

Fig: 8 Dimensions of customer experiences

2.5.1 Customer Experience stages

The customer's lifecycle, which consists of these stages and kinds of experiences, has four phases. (Porta, J. El Ciclo de Vida Del Cliente. 2016)

- **Acquisition phase**: When a customer decides they need to buy a new good or service, this process starts. The customer weighs all of his options and determines which best suits his requirements.
- **Loyalty phase:** This is the highest value that may be derived by using the good or service. The buyer is thoroughly informed about the brand and product they just bought. Creating an emotional connection between the client and the business.
- **Reactivation phase:** This happens when a customer uses a product or service less frequently, which causes them to become distant from the brand.
- **Winning back phase:** This is the manner of winning back former customers' users. Creating worth for the prior client through acts that the business deems pertinent is the key goal.

CX comprises the several reactions a customer might have while dealing with a business. According to the writers, the company's delivery of all elements both those it have control over and those it cannot generates the experience. This experience includes every step a customer might take while using any of the company's many channels. The customer experience definition is multimodal in nature and takes into account the customer's intellectual, social, behavioral, and sensory reactions to the retailer. (Verhoef et al. 2009)

The customer experience needs to be improved constantly. People will forget the things you said and the things you did, but they won't forget the feelings you gave them. (Maya Angelou) said, consequently, providing positive customer experiences are essential because they form the cornerstone of customers' company loyalty.

Today, more businesses are concerned with how they present their goods, processes, and/or services to customers. As a result, businesses work to offer a better experience in order to comprehend and give goods and services created for their clients. The majority of businesses are focused on being current, which means they take the customer into account while making decisions. As a result, the client is not seen as a problem but rather as a benefit that helps the business establish its position and gain recognition in the marketplace. Customers today play a more active role in business decisions than they always did as merely consumers. Consequently, the CX concept is being used more often. The phrase customer journey is used to describe all of the interactions a customer has with a business over the course of their life cycle and at different points along the way. (Camila Bascur and Cristian Rusu, October 2020)

2.5.2 Service Quality

Definition of quality

Quality is nothing more than our idea of what we want from a good or service. However, it differs from person to person.

Service excellence has evolved into a success mantra across many industries, from wholesale to retail. Understanding the role that services play in each sector is crucial because it serves as the foundation for evaluating services as a whole. The efficiency level is increased, which leads to the customer's pleasure, if the service provider is able to comprehend the customer's assessment criteria, build its service strategy accordingly, and put it into practice. This is the ultimate goal of all service providers because it has been demonstrated by prior studies that acquiring new clients takes more time and money than keeping an existing client. (Gentile, C.; Spiller, N.; Noci, G. (2007))

There are numerous definitions of excellence that have been articulated by very esteemed gurus, and they 0tend to be broadly recognized.

- Quality is a predicable level of uniformity that is affordable and appropriate for the market. (*W. Edwards Deming)*
- Quality is fitness for use (*Joseph M.Juran)*
- Quality is compliance with the criterion. (*Philip B. Corsby)*
- The least amount of loss imposed by a product delivered is quality. (*Genechi Taguch)*

- Quality is fundamentally a method for handling a business, (*Feigenbaum).*
- Quality is not surviving loss; it is repairing and preventing it. (*Hoshin).*
- Quality is a corporate issue and must have a pervasive impact on how every aspect of business is conducted (*Prof. Kaoru Ishikawa).*

Means of Customer satisfaction

a. Delivery - Delivered on time and in perfect condition

b. Installation - the provision of specialists or proper setup instructions for difficult items.

c. Use - Training guides or usage instructions that are written clearly.

d. Field Repair - specialists with the necessary training to carry out quality repairs quickly

e. Customer Services - Answering questions with amiable customer service personnel

f. Warranty - Claims are promptly resolved and clearly communicated.

Components of Service Quality

1. **External Service Quality**: It is common to refer to service quality as the external service quality, which describes the caliber of service provided to clients.

2. **Internal service quality:** internal service quality is characterized by how employees feel about their jobs, coworkers, and the business. It speaks to how well employees are treated at work.

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2.6 Conceptual Framework of the Study

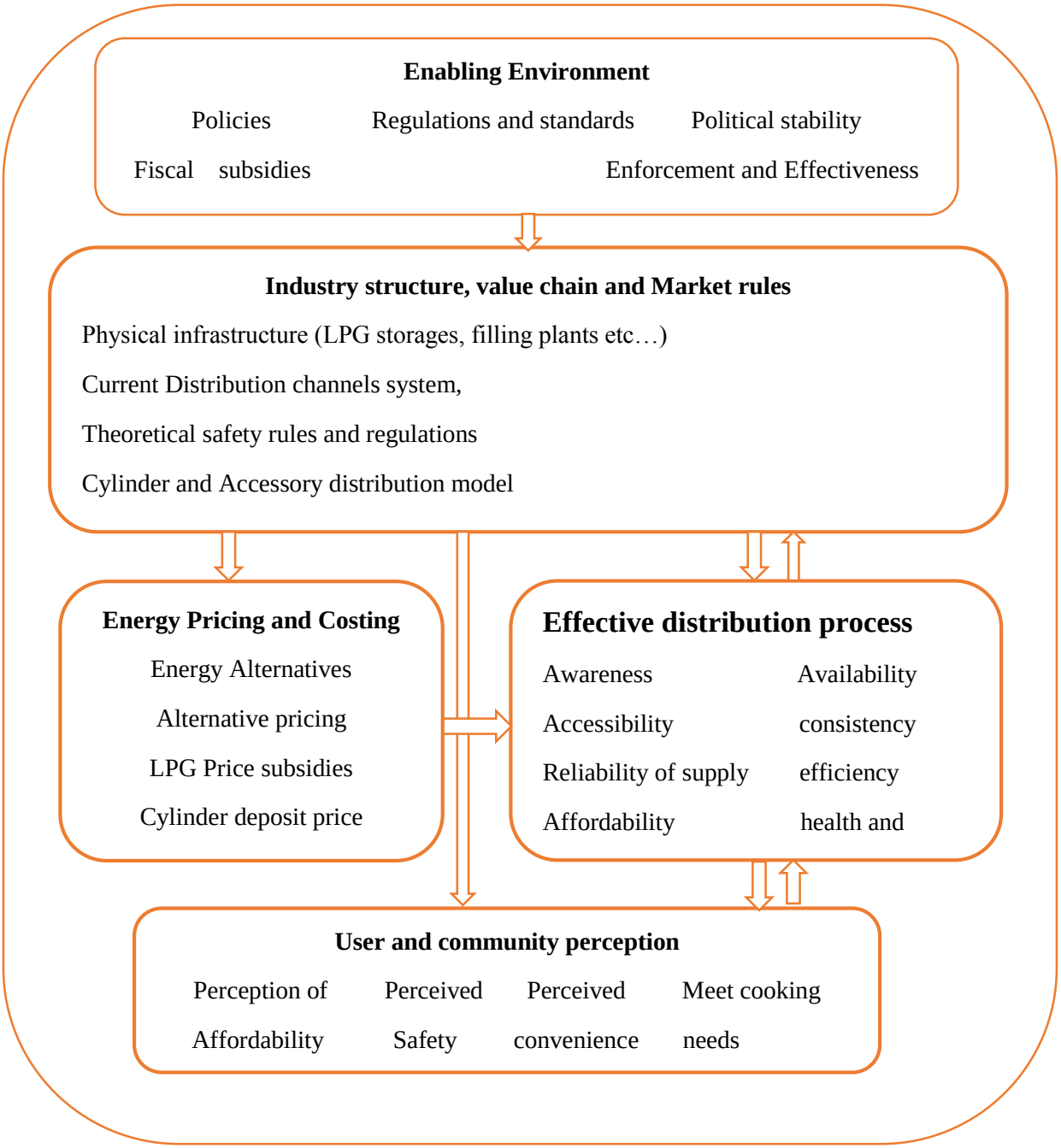


Fig 9: Source: Bruce N.G., Aunan K. and Rehfuess. 2017

CHAPTER 3

METHODOLOGY

The process of conducting research includes defining and redefining problems, establishing speculation or recommended remedies, gathering, structuring, and analyzing data, drawing inferences, and coming to outcomes. Finally, the conclusions are carefully tested to see if they agree with the hypotheses that were originally proposed.

This research tries to explore distribution processes and Customer Experience on LPG business in Addis Ababa. This section of the study detail the methodologies employed in the investigation, including the selection of specific research designs, sample strategies, data sources, and data collection instruments, as well as a suitable justification for each strategy.

3.1 Research Approach

Depending on a variety of research-related circumstances, researchers can use one of three fundamental methodologies while conducting business research. The choice of methodology a researcher uses is determined by the following factors: (a) the issue being studied; (b) the scholar's knowledge; (c) the audience for the report; (d) whether the investigator desires to outline the type of details that need to be gathered or allow it to emerge from the data having collected; and (e) regardless of the data to be gathered is written or numerals. (Creswell (2003))

This study used Qualitative research approach which briefly explain the detail of the specified LPG business field on the distribution process and customer experience on these specified business. The primary premise is that qualitative research techniques would be beneficial in situations when the researcher intends to put collectively a broad understanding from the subjects, with the aim of exploring.

3.2 Research type

This Study is exploratory type of research with Qualitative data analysis. Exploratory research is often conducted in new fields of enquiry with the aim of determining the scope or extent of a specific phenomenon, problem, or behavior. Its objectives are to either explore a field in which little is known or to look into the viability of conducting a specific research study.

3.3 Research Design

A plan for economically, effectively, and pertinently gathering and analyzing data is known as a research design. It is a framework for planning the study's execution and gathering the required data.

In an empirical research study, the research design is a detailed plan for data collecting. It serves as a "blueprint" for conducting empirical studies with a focus on resolving certain research issues.

In this Research on exploring distribution process and customer experience on the LPG business the study conduct Case study design approach. It is a method in which a single instance or a small number of carefully chosen cases are thoroughly analyzed, in which these research is all about explore distribution process and customer experience on the LPG business. In exploring Distribution process, the case we choose serves as the foundation for a comprehensive, all encompassing, and in depth investigation of the component we want to learn more about which is the LPG product in Addis Ababa.

3.4 Data Collection

In order to obtain enough information, this study use personal Unstructured Interview as a primary source and different documents and literature reviews as a secondary sources. Interview with governmental bodies, who are experts from Ethiopian Energy Authority in the specialization of LPG Accreditation, importers and distributers, whole sellers, retailers and customers from different working environment took place as primary source. An interview is an oral conversation in which the interviewer attempts to elicit knowledge, beliefs, or opinions from the subject. It can also be a direct communication among two or more people that take place one-on-one or in another setting and has a predetermined goal. Total freedom is offered in terms of both the content and the framework.

Unstructured interviews give both the interviewer and the interviewee the freedom to ask and answer any questions they choose.

3.5 Population and Sample

The complete group of individuals, occasions, or interesting objects that the researcher seeks to study is referred to as the population. An element of the population is a sample. Some of its members were chosen from it. The procedure of choosing an adequate quantity of components from a group of individuals is known as sampling. By learning the sample and coming to figure out its properties or characteristics, we can then apply those same properties or characteristics to the population's individual elements.

In this research, since most of the participant bodies of LPG distribution supply chain are known and most of distributer and wholesalers are experienced the same environmental influence, the study uses Non Random Expert sampling method for importers and distributers, whole sellers, retailers and government bodies, in which all of participatory bodies are experts and experienced in the distribution of LPG business. In the case of expert sampling, those responding need to be well-known expertizes in the area

you are interested in, whereas, Non Random Judgmental or purposive sampling method is used for customers or end users, in which those end users are directly affected by distribution process of LPG, Which shows party that able to provide the most information to help accomplish the goals of the research and willing to share it.

The data saturation threshold, which occurs in qualitative research, is typically reached when the amount of data has reached a level that no longer yields any new information or that it is significant.

Importers and gov't regulatory body

Parties in the LPG business	Population	Samples	Method
LPG importers and distributers	5	5	Interview
Government officials	2	2	Interview
Total	7	7	

Table 7: interviewed no. of Importers and gov't regulatory body (Experts of LPG accreditation from Ethiopian Energy Authority)

Whole sales and Retailers

Retailers	Populations	Samples	Methods
Ghion gas company owned retail shops,	3	1	Interview
Oil Libya retail station for Ghion gas	10	1	Interview
NOC retail stations	10	1	Interview
Allied Energy (safe gas) Retail	1	1	Interview
Modern Gas retail	1	1	Interview
Retailers with different suppliers	5	2	Interview
Total		7	

Table 8: interviewed no. of Whole sales and Retailers

Customers

	Populations	Samples	Methods
House Holds		2	Interview
Cafe and restaurants		2	Interview
Factories / Industries / hospitals		2	Interview
Total		6	

Table 9: interviewed no. of Customers

Parties	Samples
Importers and gov't regulatory body	7
Whole sales and Retailers	7
Customers	6
Total	**20**

Table 10: total No. of interview

3.6 Data Analysis Techniques

Utilizing techniques for qualitative data analysis, this study examined data from both the primary and secondary sources. Data were collected in interview format and different literature review. The information gathered through individual interviews with open-ended questions from different Governmental bodies, importers and distributers, whole sellers and different targeted customers is analyzed using thematic analysis, which is suitable for analyzing people's opinions and Experiences . In thematic Analysis large data collected are grouped according to similarity of their raised ideas which are themes. In this Studies, large group of data is collected through interview from different participatory bodies of distribution process. Those interviews are transcribed and coded then different themes are outlined by the similarities of codes from different feedbacks and grouping them.

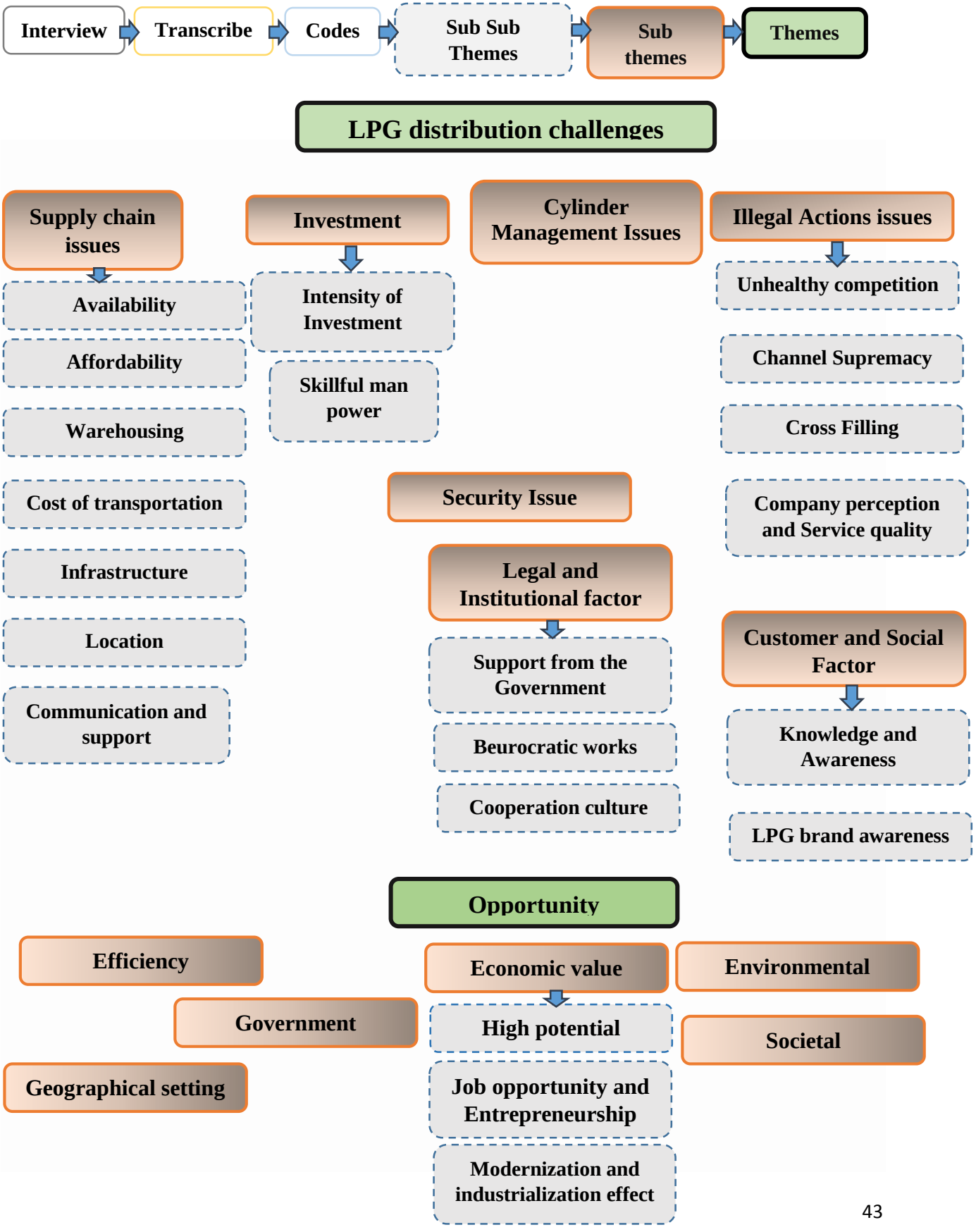
3.7 Credibility and Conformity

For ensuring the results found on the study to be credible and dependable the pilot interview is implemented for different LPG distribution participant's interview, and all those pilot interview respondents are eliminated from the final study. The pilot interview used as weather the real respondents were really support to get the desired outcome. And by sharing the output result for participatory personals which are on the LPG business and its conformity is achieved. Triangulation method also applied to crosscheck the result founds from different conclusions and information sources.

3.8 Ethical consideration

This study is being done on the data collected from different participants from Importers and distributer, wholesalers and retailers, different category of customers or end users and government officials through interview. All of the participants made to be aware about the research objective and acknowledge their willingness. All respondent identity is guaranteed to be confidential and listed by the name of "Respondent", "Participants" and "interviewer".

3.9 Data Structure



CHAPTER 4

RESULTS, DISCUSSION AND INTERPRETATION

4.1 Demographic profile of the respondent

Most of the Respondent of the interview are experienced in these field of specialization, especially respondent from importers and distributers are detail oriented in these field of expertize.

Table 11: Respondents Work Experience on distribution process of LPG for importers and distributers, wholesalers and retailers, then familiarity of the usage for how many years of time by end users.

No. of Respondent	Year of Experience (Year)		
	0-3	4-7	>7
No. of respondent	4	14	2
% Value	20%	70%	10%

4.2 LPG Distribution Challenges

Ethiopia with more than 100 million population plus vast growing industry, with Addis Ababa more than 5 million residents needs to satisfy energy means with accurate and compressive plan by using efficient and reliable source of energy for households. The current system of using energy by households and industries is mostly reliable on Electricity, kerosene, fire wood and charcoal, with a very minimum amount of LPG usage. Out of these LPG usage in Addis Ababa is very limited and the distribution process also surrounded by a lots of challenges and hustles, so Ethiopia as a country and Addis Ababa as a capital city lose a lots of opportunity and beneficiaries from these reliable and efficient source of energy.

4.2.1 LPG Supply Chain issues

4.2.1.1 Availability: As we have tried to list in the literature review of challenges in the LPG supply chain is lack of availability or inconsistency in the supply is one of the major challenges faced in the Distribution process in which the incompatible growth demand and supply constraint. There are many reasons for the unavailability or interrupted supply of LPG in Addis Ababa, most of them are due to Lack of foreign currency for Importation, limited storage capacity of distributers, insignificant effort on infrastructure investment and illegal activities by supply chain networks take the priorities. This unavailability situation goes to “fuel stacking” phenomenon and forced the end users to take other alternative energy sources or fully diverted to other available energy means.

Respondent from Importer and distributer ”currently we are covering 11,000MT to 12,000 MT of supply out of 15,000MT usage in Ethiopia, by importing and distributing to our partners and retail out lets.

Respondent from customers “Due to shortage of LPG gas we are in high trouble and eagerly seeing any other energy source opportunity like electricity even charcoal and to replace our machines “.

Respondent from wholesalers and retailers “I have never seen a time when LPG distribution process is smooth throughout the year, its common to see shortage of LPG like 3 months throughout the year.”

Respondent from wholesalers and retailers “due to shortage and price fluctuations customers gets bored and looking for another means of cooking like Electricity.”

Respondent from wholesaler and retailers “We didn’t get the product whenever we want, I think it’s either it takes for them long time to deliver the product for the city or there is shortage of gas from suppliers, we only get the gas whenever they want”.

Respondent from Importer and distributer “even though we encounter different economic hardships, lack of peace and security especially Sudan civil war makes everything hard “.

Respondent from Importer and distributer “we are idling more than 15 modernize cylinder filling machines because of shortage of gas and we are working below our operation capacity”.

Not only is the LPG itself not available also the Accessories materials are not available in accordance with wholesalers and retailers.

Respondent from Wholesaler and retailer “we are not getting any accessories materials from importers and wholesalers, whenever they imported accessories they give to some personals that looks like there is some personal chain with the managers of importing company, I doubt!!!”

But according to importers and distributers they are not in shortage of Accessories materials also respondent from house hold and bulk takers they are not in severe shortage of Accessory materials.

4.2.1.2 Affordability: As we have tried to mention in the theoretical review part price fluctuation is one of the major challenges encountered. Since all participant bodies of LPG distribution process are private sector driven all the price adjustments are done by small importers and distributers. There is high fluctuation of the gas price due to different political, and economic factors. These boosted and abnormal

increase in the price becomes one of the major challenges faced by participant bodies' especially low level distribution channels (retailers) and end users.

Respondent from Importer and distributer "currently the price of LPG in Addis Ababa is around 190birr up to 200birr per kg of the product, which is very expensive in which we can compare to Khartoum town current price which 10 birr-15 birr per kg"

Respondent from House Hold "to be honest the price inflation of LPG is very unreasonable and as of my side am stopping using, I can't purchase one 12 kg cylinder by 2500birr, I can't afford and not logical for me. Am taking cylinder gas as back up for my electricity interruptions only."

Respondent from Retail stations" due to the high price increasing now a days households discarded the cylinder gas and currently hotels and different industries are the one who can afford and purchase by considering their profit by using LPG."

Respondent from Wholesaler and retailer "the customer comes with a long time and after they came up due to the big price difference in our station they don't buy".

Respondent from Importer and distributer "price fluctuations in the international market, current economic trend and the current incremental cost of logistics cars fuel becomes the major reasons for dramatically price increase.

Even though most of the respondents are complaining about the unbalanced price increase of LPG gas some respondents are arguing the price increase is not that much exaggerated in accordance with the current economic situations in Ethiopia and Addis Ababa.

Respondents from wholesaler and retailer "I say its slow and smooth increasing of price unlike other commodities, I can say that it is not that much exaggerated".

One significant obstacle to customers adopting LPG is the high initial expenditure of an LPG "starter pack." LPG requires a starting capital in the facilities, and refilling is typically offered for full storage containers, necessitating an upfront gas purchase for a few weeks or a month. This has already increased pressure and shut off some consumers. Many individuals cannot afford the initial expenditures of the beginning apparatus or the ongoing costs of routine refills, which are associated with using LPG for cooking.

Respondent from Customer “I have been in different countries for work and here in Ethiopia the cost of LPG accessories like regulators, pipes and hoses are four times expansive that of Turkey, and Cameroon, which is very costly and am always surprised”

4.2.1.3 Storage capacity and logistics: Lack of port is one big challenge as a country for Ethiopian which directly affect the Availability and affordability of LPG product distribution process in Addis Ababa. Sudan port is the only available high storage capacity port. Other ports don’t have enough storage terminals which can store bulk amount of LPG product. This leads to pay high cost to logistics and storage rent rather than the original LPG price. Due to lack of storage terminal and high payment cost most of the importers forced to purchase small amount of Shipment from main suppliers and transport to their storage in Ethiopia. This small amount of logistics transaction will lead to high transportation cost which lead to high operation cost and high price incremental in the end user.


Fig: 10 sample storage

Respondent from Importer and distributer “Previously we were renting terminal storage at Sudan Port and capable of purchasing large bulk amount of LPG product from suppliers in a range of full ship size, we store it and we were effectively supply the Distribution supply chain without interruption and cheap price like 34 birr per kg of the product. After sawing our effective operation the government of Sudan quite our agreement for terminal storage and start the Importation storage and distribution by itself”.

unlike respondents from Ghion which have more than 60,000 m^2 feet storage at Dukem and Nile petroleum 8,000 m^2 feet storage compound at sululta, most of the importers and distributers, wholesalers and retailers face lack of localized, decentralized in different parts of the city and large storage capacity depots for preparing filling facilities, in addition lack of coordinated means of transport channels for the city, which is aggravated by scarcity of road infrastructure. Limited storage capacity of depots by most of the importers is heavy challenge experienced by the participant bodies, since these storage facilities require substantial capital expenditures, longer time taking which takes more than a year or above to

construct, and absence of better capital system for infrastructure in the importing and distributing companies, its big challenge even worse for the new joined LPG marketer.

Respondent from Importer and distributer " we have tried to work on increasing storage capacity of the depot but since these huge size tankers need more space to each other and the expanding nature of the Addis Ababa to our storage depot (Dukem), which contradict to the safety issues of the city make us limitation our capacity to only 300MT".

From the currently actively importers and Distributers NOC, Ghion and Nile petroleum (Sudanese plate) have their own Bobtail cars to transport LPG gas from ports to their storage Depots near Addis Ababa. Companies like Allied Energy and Modern Gas use different rental transport cars from different transistors and local LPG importers for importation of bulk gas from port to depot nearer to Addis Ababa. Even though most of the importers and distributers in the city have their own depots, some of the bulk importers and distributers like Allied Energy (safe gas) and Modern Gas stores bulk imported gas through rent from other companies like Nile petroleum, WAS, Iran Merfic and so on. Again only Ghion Gas, Allied Energy (Safe gas) and Modern Gas have their own Bob tail car tanker for customer site tanker refilling, still big importer companies like NOC using rental Bobtail Tanker car to address and refill customers LPG tankers on their sites.

For Importation process currently Ghion Gas have 20 bobtail trucks, NOC have 6 trucks and Nile Petroleum is using Different Sudanese plate (petro Trans cars, sister company of Nile Petroleum) bobtail trucks.

4.2.1.4 Warehousing: As I have tried to discuss in the theoretical literature review part, ware housing is one part of physical distribution process that have great role in the distribution process. Except those of potential Importers and Distributers like NOC, Ghion and Nile Petroleum most of the supply chain members don't have enough standardized warehouse for empty and filled LPG cylinders, that let them faced with different routine transportation work, which leads to delay of customer service and additional cost. Most of wholesalers and retailers in the city also don't have standardized and enough warehouse to operate the distribution.

Fig: 11 Cylinder Warehousing

4.2.1.5 Cost of transportation: Transportation is one major part of the Physical distribution process and its price is affected by the journey from the source, as we have tried to look at in the literature review. Since Ethiopia is fully depend on Imported LPG product, all those means of transportation costs from importation from supplier companies to go through distribution channel members are costly. Transportation means for importation is mainly through shipping and road transport, as it depend on supplier origin, for example if the supplier company is from middle east like UAE the importer should pay for additional break down cost for water shipping and land transport from ports to their warehouse depots. But if the supplier origin is from neibours LPG producing countries like Sudan or Kenya


Fig 12: cylinder Transportation

There will be only Land transportation costs up to their warehouse depot, which greatly affect each shipment cost break down and have significant effect on price fluctuation. Again additional transportation cost served during the process of local delivery through supply chain channel up to end users or customers.

Respondent from Importer and distributer " we give the most affordable price for our customers but the big problem is we faced is cost of transportation we encounter from Sudan port to Addis Ababa which is around 1900km, which is costly when we compare if we take alternatives like Berbera - 900km, Aseb and Mitsewa - 953km, and Djibouti which is 928km". So the cost that we are required to work on Sudan port is twice as much as if they use from other ports.

4.2.1.6 Infrastructure condition: very uncomfortable road infrastructure, which impedes the channel's ability to deliver the product to consumers. Interrupted electric supply for the filling plant is one major challenge that's creates human made scarcity and delay service of LPG gas.

Respondent from wholesalers and retailers "Crowded roads and lack of sufficient empty cylinders are the major problems for effective delivery process

4.2.1.7 Location: As a retailer dealing in the distribution of LPG in a certain location, they have a better chance of reaching more customers because services are closer to end consumers. Location is one of the basic proper strategies to make the best alternative for whole sellers and retailers when it comes to the Gas market. The Retail sub-division is rapidly extending its reach and client base across the country, with the objective of being the preferred market leader in delivering LPG products to consumers across the city.

Here we can see the location retailing strategy performed by one of Importer and distributer to Address the all district of Addis Ababa, "we have given best location based strategies to overcome the location issues in our outlets as by dividing Addis Ababa in to Four Regions as East district from 22 area to Hayat, West District from Lideta to Jemmo, North District from Addisu Gebeya to sululta and south region from Saris to kality, and tries to reach every corner of the city as much as possible.

Finding strategic location that is suitable for the distribution channel and the cost of house renting for warehousing is another challenge for participant bodies especially for retailers, which makes less competitive regardless of price and accessibility for the targeted customers.

4.2.1.8 Communications and support from channel members: This factor was widely discussed in the Channel membership structure of supply chain in the literature review. From different interviews I can observe that this challenges faced by especially by private owned wholesalers and retailers aside from importer and distributer owned brand outlets. Lack of effective communication and support through supply chain is another challenge for the channel members especially for low stream groups like private wholesalers and retailers. Interview from these groups highly emphasized that there is no any means of information flow regards of availability and affordability of LPG product in professional and standardized format. at some time LPG product becomes surplus in stock unfortunately at some point of time it becomes zero stock and because there is no guaranteed information from the upstream channels, the wholesaling and retailing operations guided by traditional manner.

4.2.2 Investment Issues

4.2.2.1 Intensity of Investment: still now there is a low level of involvement from international development partners, local and foreign investors, and the government itself in the area of LPG distribution business. The business is monopolized by some big companies with low level potential investment and effort on their infrastructure appliance and Assets (LPG cylinders, expanding depot services, LPG accessories and logistic materials) and these creates low level of opportunity, alternatively, affordability and accessibility on the distribution process this is one big challenge for smooth operation of

distribution process. Most of the distribution process participatory partners stressed that after they have guaranteed solving the different challenges faced on the business like affordability and availability issues they are interested to invest on the business, otherwise it's become very difficult to work on additional investment.

Respondent from Customer "am very up sated by distributers, they always gives excuses of delivery car is in garage due to small spare part and the delivery schedule will be delayed up to more than 2 weeks, that's very hard for us since we are factory based on daily KPI and daily production measurement."

4.2.2.2 Skillful workforce: In the LPG distribution process we can highly observed that there is lack of professionals and skillful workers in each step of Distribution process starting from distribution to customer service. Most of the job is handled by non-skillful traders and the market is ruled by random processes. some importers and distributers employee some skillful technical personals for handling different industrial and end user LPG line installation and sometimes advise end users for proper usage, aside from these I didn't observe any company based training prepared for customers. Again aside from Importers and distributers most of the customer handling and serving process is very unprofessional with in the downstream channels like retailers.

Respondent from upper supply chain highly criticize the customer side awareness regardless of working on LPG pipeline infrastructure work. "Most of them remember gas line after finishing all the building process, there is not that much consultant company which skillful and professional on these areas like different structural, electrical and sanitary designs."

In the contrary it can be observed from some company that, they are highly working on the technical skilled labor force and serving their customers.

Respondent from Importer and Distributer "we have organized technical team and try to solve any problem faced by our customers".

Even though there are some skill full technicians and professional workers in this business, there are complains regardless of available safety working materials.

Respondents from wholesalers and retailers (Delivery persons) "currently our company don't support on safety materials issue, no safety cloth, no safety shoes, no gloves in site areas. The government should focus on such issue and prepare some enforcement rules"

4.2.3 Cylinder Management Issues:

LPG Tanker and cylinders most of Distribution channels members starting from importers up to low level retailers don't have enough complete gas cylinder stock at all times to meet client orders immediately for ensuring effective supply of LPG gas, and don't have effective Cylinder management or follow up procedures to follow the status of their cylinders. Some potential distributers import their brand cylinders and transfer to the distribution channel members (whole sellers, retailers, and end users) through buying options and the others uses deposit based, but there is a weak follow up for the dispatched cylinders status and most of the Distributers doesn't know the status of their cylinders weather they are in good conditions or not , which is merely relied on unprofessional end users, which result in low distribution operation performance in the channels and risk of explosion on the customer side. From the currently active LPG importers and Distributers NOC, Ghion and Nile petroleum companies transfer their cylinder to the wholesalers, retailers and end users through sales, on the contrary companies Like Allied Energy and Modern gas deliver their cylinders on deposit bases.

As we have tried to cover widely about cylinder distribution in supply chain "BCRM, CCCM and management issue in the literature review. it is one of the major challenges faced in LPG distribution process of Addis Ababa. It is experienced with both methods we come to distribution process in our city. Both of the cylinder distributions process are experienced by Importers and Distributers.

Currently in all LPG marketers must operate in the Branded cylinder recirculation model" (BCRM) which is the most reliable rather than "customer-controlled cylinder model" (CCCM) brand owners, importers and distributers can only sell filled cylinders of their own brand, and any empty cylinders of other brands that are returned by consumers must be exchanged for their own cylinders or a deposit refund, as is the case with safe gas and modern gas. Consumers who no longer have to go without gas if their brand is not accessible were pleased with the exchange agreement for full sellers and retailing with mutual consensus of both parties and positive agreement of retailers , but with ensuring they have compatible regulator type, or the customer may change regulator of the available gas brand for convenience with buying option, with the reality of holding more than one type regulators for different brand, if the different brands don't have compatible regulators. Simply exchange an empty cylinder held by the consumer or store for a filled cylinder of the new brand with mutual agreement.

Respondent from Importer and distributer "Even though we are delivering the cylinders to the customers through sales based as in the CCCM model based whenever there is any safety issue happened on the cylinder we always care as it is our brand mark"

 Fig: 13 Sample Cylinders

One of the basic cylinder management issues challenges for the whole sellers and retailers is that the no. of available stocks in the ware house which actually plays significant role for fast transaction. When a customer purchases a filled cylinder, it will take some time before the gas in the cylinder is finished, so the whole seller or retailer must have enough inventory too smoothly over run the business until the empty cylinder comes and exchanged.

Another challenge with the cylinder management issues is turn round time of one brand cylinder by distributers, Whenever one brand of filled cylinder is bought and used by customer, Customers anticipate discovering packed cylinders in their retail locations., whether it is the neighborhood shop, or nearby supermarket. If the desired brand is not available, they will immediately select another option from the wide range of choices offered. and if the customer exchange the used one brand empty cylinder by another available refilled cylinders or illegal refilling of the original cylinder will affect the turn round rate of one brand cylinder, leads to shortage of own brand cylinders due to high waiting time for refill and over run less gas refilling transaction which heavenly harm the smooth operation of the distributer. With so many brands available, a marketer who lacks enough cylinders must spend a lot of time and money obtaining any cylinders held by the illicit competitors. If the cylinder quantities are little, the visits become uneconomical. When a marketer has gas for sale but no cylinders to fill it with, a crisis ensues, which will cause crises to develop in the future.

Controbanding Cylinders and accessories becomes another hustle for the Distribution process

Respondent from Importer and distributer “it’s well-known that we are one of the bulk suppliers in Ethiopia and Addis Ababa, in which we dispatched more than 700,000 cylinders across Ethiopia, but unfortunately we are facing illegal cylinder Controbanding activities to Eretria, which seriously affect our distribution operation and our country economy.”

There are also some fake cylinders dispatched that doesn't qualify the technical standard of safe cylinder quality and that actually looks like the well-recognized brand, that will erase legally brand acceptance whenever accidents happens.

When we come to LPG tanker most of Importing and distributing companies like Ghion, NOC, allied Energy and modern gas provide bulk usage LPG tankers for their potential customers through free loan based and we can see there is a better follow up on those cylinders when we come to technical assessment and safe usage.

4.2.4 Illegal Actions issues

4.2.4.1 Unhealthy competition: even though there is huge potential and opportunity in the LPG distribution business in Addis Ababa, the occurrence of unhealthy competition and unsupportive bad culture by different participant bodies in the business, which focus on hurting and removing competitive companies rather than collaboration working culture seriously make obstacles for the healthy function of distribution process. The need of controlling these attractive distribution process by monopoly is a serious challenges for the existing compitators company and new emerging companies. Any new company who want to participate on the LPG distribution process will be affected seriously, and the existing ones will also suffer hardly and forced to terminate the LPG business.

Respondent from Wholesaler "it's very hard to compete and also to create more close relationship with another wholesalers and importers and distributers, I have been tried too many times to get dealership or being agent relationship with the potential Distributers by fulfilling all the necessary criteria's needed (financial ability, necessary infrastructures), but the business or distribution process looks corrupted and works only through personal chain and incentives method, that's really hurting and we are forced to re bounce and doesn't have any motivation from the working structure."

Even though I can observe there is less attractive cooperation culture by most of the respondent from importers and Distributers, there is some kind of optimistic suggestion by respondents to do not fully enclose by fully negative conclusion.

Respondent from Importer and Distributer "Currently there are limited Importers and Distributers in the field and we have worked in a collaboration way and have a good relationship with other brand suppliers."

Respondents from wholesalers and retailers "We don't have that much sense of rival, and also i didn't see cooperation behavior also."

4.2.4.2 Channel supremacy since the LPG product is controlled and ruled by private sector aside from governmental control, there is Advantageous opportunity by supplier member channels over end users or customers. Despite the distributions channels adjusted price based on several factors like cost of business, lack of currency and supply shortage the uncontrolled manner of cost estimation by suppliers create a huge hustles for the end users and adaptation process of these efficient source of energy.

4.2.4.3 Cross filling: as discussed in the literature review Decantation and Cross filling one of the major problems faced in distribution of LPG**.** It is one of the illegal activities performed by most of distributers, wholesalers especially retailers that are closer to the end users. One Respondent from Retailers express these cross filling action is a result of continuous interruption and shortage of the Gas.

The refilling of brands by parties other than the brand owners has grown to be a very delicate subject. This activity currently becomes a tremendous problem for distribution process of LPG in Addis Ababa. Many unlawful supply chain participants decant gas from one cylinder to another using illegal methods, which causes customers to receive underweight, dangerous, and counterfeit refill gas. These actions have a high potential for causing gas leaks and explosions, which would cause significant harm to both property and people's lives. Many distributors are found to be refilling other brands of cylinders in Addis Ababa without entering into any formal agreements with the other brand. And also different whole sales and retailers are participating in such activities without any hesitate and even looks like its legalized, this makes a big problem for the smooth distribution process.

We can observe that there were some such cross filling issues brings to the court. Respondent from one distributer informed me that as they have sample cylinders of illegal cross filling with the other brand seal label done by another distributer brand which highly affect the trustworthiness of their brand due to weight loss and insecure filling and brings those case to the court, and respondent from another distributer informed as such kind of occasions happened during the shortage time and these actions were happened by optimistic assumption to help end users for the easily accessibility of the gas and already the disagreement is settled by now.

It is observed through different interviews from importers and suppliers that there is no any regulatory laws and regulation that states about illegal cross filling but Major Importers and Distributers are working by mutual consent to only fill cylinders of their own brand only.

Respondent from Importer and Distributer “In other countries there is a ‘uni’ law which says no other brand can refill other brand cylinders.”

Also the necessary quality and standard of the filling machines must be checked.

Respondent from wholesaler "when we check the net weight of filled cylinders from some distributers we always encounter loss weight, and give us the reason of error from cylinder measurement machine, but we all knows that there are some fraud action with knowingly, for example if the person who fill the 12 kg cylinders might fill 11kg each of them and fill 12 pieces of he can easily stock one 12 kg cylinder and when we consider in the price it will be average of 2100birr, this is very serious issues as we wholesalers and retailers lose customer trust by fault kg measurement, so am forced to take my own measurement tool for confirmation of each cylinders, which really affect mine time for checkup and transportation cost.

4.2.4.4 Company perceptions and service quality: Service quality is one major concept that is widely covered in the literature review and have different dimensions of measurement.

Respondent from bulk customer" I have been working with three different importer and distributer company, and normally since Addis Ababa is at around 2300m elevate below sea level the standard conversion factor from (Liter to kg) supposed to be 0.58, but one of the company is calculating by 0.606 which is illegal and the government should strictly take the necessary measurement since they are charging money without the standard." For example if the price of 1kg LPG is 150birr, and let us say I have filled the tanker with 200liter, so when we convert Liter to kg,

= if it was through normal standard 200 * 0.58 =116 kg, 116kg * 150 = 17,400birr

But with the illegal conversion rate 200 * 0.606 = 121.2 kg, 121.2kg *150 = 18,180birr so these shows we are paying additional payment for the same amount of quantity than others.

Again As we have seen in the literature review delivery of LPG service can be home to home delivery or the customer might go to the shop, which depend on the customer service behavior of the service provider.

Respondent from Hospitals" I have been working in this hospitals for the past 7 years, we have been one of the potential users of LPG product for cooking purpose of our patients, we have been working with one potential supplier and am always pleased by their service quality like customer handling, cooperation and so on except delay of delivery time of the product but since we are dealing with patients of hospitals its very serious issue for us." As we have explained delivery is one component of the service quality.

Again aside from such complained service quality there are good aspects raised from the Customers regardless of customer experience.

4.2.5 Legal and institutional factors

4.2.5.1 Support from the government: There is lack of regulatory law enforcement for all participant distribution channel members starting from importers to end users across Addis Ababa, these absence of enforced rules and regulation let the distribution market to be unhealthy and disturbed. This concept is widely discussed in "Government policies and actions, as well as market structure and regulation, are covered in the literature review.

Ethiopian Energy Authority that will inspect the activities of petroleum products in which LPG is one sub unit, it have the responsibility of give competency check for LPG companies, but don't have any regulatory body that will assess the distribution process.

Respondent from the Government body "we have the responsibility of to check the technical assurance of companies and give competency license through our technical team of Electrical, civil, mechanical and petroleum engineers, as the LPG companies full fill the necessary standards regardless of their materials and guided by international standards, and as they satisfy the Ethiopian charter 838/2014 for starting LPG business. We don't have heard any complain on illegal activities performed in the distribution process and it's also not our responsibility, whenever such dispute occur it will judged by local courts, all the retailers' license is approved and given by local trade bureau in their respective areas."

Again since most of the cylinders age dispatched by importers through importation, which also requires substantial capital expenditure, getting financial support is huge challenges for the business to run. Each level of the distribution system is constrained in the number of cylinders it can manage by its operating budget, which has a direct impact on the number of clients it can service and the efficient distribution of LPG. Due to a lack of working capital, retailers and lower-end whole sales channels frequently run out of inventory. Many of the respondent from supply chain stressed that they are focusing and giving emphasis on LPG product itself rather than working on LPG cylinder importation due to foreign currency shortages and liquidity issue aside from the current economic challenges of the country. They informed that there is a big challenge to get foreign currency from banks and support from the government is low.

Respondent from Importer and distributer "Even though we are heavenly working on exporting products we are not having enough support and attention form the government regardless of the foreign currency as expected."

Respondent from Importer and distributer “even though the government gives LPG as priority for undertaking foreign currency currently we are not getting enough foreign currency for importation, the foreign currency priority is still theoretical.”

Respondent from Nile Petroleum “since our company is foreign we have not that much big deal issue with foreign currency, especially the government give us special support in the importation of last two shipments.”

4.2.5.2 Bureaucratic works: LPG distribution process starting from importation to supply for end user is full of uncomfortable bureaucratic procedures, which arises from lack of offering foreign currency for importation from banks and different governmental procedures and customs analysis lagging from Ethiopian customs agency. These and other many bureaucratic factors heavenly affect the importation and distribution chain by interruption and delay of supply chain network, besides these bureaucratic procedures produce loss of interest for new LPG participants.

4.2.5.3 Cooperation Culture: lack of cooperation between participatory bodies of the distribution process and lack of standardized LPG distribution participatory bodies Unions to overcome different illegal activities is another challenge faced.

4.2.6 Customer and social factors

4.2.6.1 LPG Brand Awareness Maintaining a brand-loyal network is one of the main problems of operating an LPG business in Addis Ababa. Channels substantially dominate and rule this distribution business which starts from importation, distribution, whole sales and retailing, in which all of them becomes beneficiary when the price getting rise and increase their price margin. Most of the time, it is the brand a customer chooses and the way that brand is distributed that is most important to their decision to buy. End customers, who make up the majority of the LPG market, do not have much negotiating influence along the supply chain. Thus, for LPG firms, creating brand awareness continues to be a costly, time-consuming, and long-term task. The opportunity-rich sector of the economy is expanding, but unhealthily. From the interview members specifically from customers LBG brand awareness is very low except knowing of two major brands like NOC and Ghion Gas.

If these illegal cross heavenly proceed such activity without any law boundary, shareholders trust on the LPG business and customers perception on the safety and health highly erode, it degrade cylinder investment by LPG business participants, also affect the welfare and safety of LPG. It is best for the

government to put regulations into place that restrict the actions of this group of people. Following that, government must maintain effective enforcement throughout the industrialization period.

4.2.6.2 Knowledge and Awareness: Lack of knowledge from the government official about competitive advantage of LPG in our Modernization and industrialization process of Addis Ababa, that leads to low level of attention in the business is one big challenges faced in the Distribution process.

Again fear of explosion risk, Misunderstandings and misconceptions among customers and end users, Concerns about safety prevent many markets homes from converting to LPG. In order to encourage the use of LPG, it is crucial to overcome misperceptions, fears of explosions, and a lack of understanding about its safe use features. Lack of awareness about technical and safe usage of the LPG product and accessories with in the society even on the modernized society members is very low.

Since the work done by the government and LPG participant bodies is very rare such misconceptions are heavenly spread and so many households with LPG stove didn't use the LPG product. Due to worries regarding the fuel's handling and usage safety, a lot of homes are hesitant to transition. This is one major problem for the effective penetration, adoption and market growth which result in lower usage of and create trouble for smooth operation, distribution of LPG.

Respondent from wholesalers and retailers "Most of the customers are full of fear about gas and consider it as deadly matter."

Respondents from wholesalers and retailers "Accessories like regulators once failed they cannot repaired easily, even though they are good in quality, but the technical awareness of the customers is low its can be failed"

Users with knowledge find LPG equipment to be straightforward and simple to operate.

4.2.7 Security issues: currently: The security issue becomes one of the prominent challenges of the distribution process, which severely affect the smooth and consistent distribution of LPG gas.

Respondent from Importer and distributer "even though we encounter different economic hardships, lack of peace and security especially Sudan civil war makes everything hard ".

Respondent from Importer" East Africa Is in trouble, Sudan is at war, Ethiopia is at war, Ethio Sudan border is very dangerous territory, and ways to enter Addis Ababa is mostly closed due to security issues" the security issue becomes the most challenging issues in these days in the LPG Distribution process.

Sudan port was the major port used by many importers due to its storage capacity and cost effectiveness other than Kenyan or Djibouti ports. But now a days there is instability in Sudan (Sudan is at war), which leads to bulk shortage of supply, interruption and high price amendment in Addis Ababa.

Respondent from Importer and distributer "we are charging additional payment for military convoys, our drivers are working at high risk, in the nearer time two of our Trackers were under attack.

4.3 OPPORTUNITY

4.3.1 Efficiency: LPG is capable of cooking faster than kerosene and firewood stoves. LPG is a very efficient and reliable source of energy, when it is entirely contained within an enclosed structure from the source of generation to the final point of consumer utilization.

Respondent from bulk user "LPG is very fast in terms of cooking, which we need prominently as we are food manufacturing industry."

Respondent from Importer and distributer "I can see the importance of the LPG with regards to cost wise, price relative to effectiveness, time wise which is the time usage and Quality wise which is the materials itself".

Cooking fuel	Calorific value(KJ/kg)
LPG	45750
Kerosene oil	41500
Charcoal	29600
Wood	14400-17400

Table 12: Efficiency comparison Source: WLPGA 2019

4.3.2 Government: Even though LPG storage and handling procedures have not had well-developed rules and practices for decades, new governmental attention is given for these sector, knowing that the city is one of the fast growing capital across Africa and the government is really hard working on the standardized and professionalism of urban life and energy usage. By allowing the LPG market to develop

in line with the global market through the free market policy, the government has genuinely taken some promising steps. Currently, more LPG firms are taking part in the importation and distribution process. This development really results in more supply on the market and more rivalry. Eventually, only the most effective and experienced players will be able to dominate the scene. It is now time to begin implementing laws and regulations, controlled distribution channels, service quality, and raising awareness. The prioritization of foreign currency for LPG importation is also one further step ahead for the distribution process.

4.3.3 Economic value

4.3.3.1 High Potential demand As stated in the theoretical literature review, The majority of the world's population, or close to 3 billion people, rely on food prepared with traditional fuels including wood, charcoal, coal, and kerosene. In Sub-Saharan Africa, 80% of the population utilizes these fuels, whereas Addis Ababa has a usage of less than 1%. LPG distribution business in Addis Ababa is considered as one of the profitable business. Urban lifestyles have a large and unrealized potential with the high optimistic future of increasing high demand form the households, different LPG gas users and industries in accordance with the vast increased of population in Addis Ababa and the modernization effect which opens for adaptation of LPG usage in the city by households for modern cooking purpose. In addition the vast economic development of the city like different standardized hotels, restaurants, different coffee roasting and exporting companies, different standard workshops and urban based heavy industries with the high demand of LPG which is source for effective source of energy will create huge opportunity for the LPG distribution business in Addis Ababa.

Respondent from Importer and Distributer “when we see the 2020 data Hotels Restaurants factories and households were the potential customers, especially coffee roasters are bulk takers”.

Here also there are optimistic news from the government that there will be surplus production of natural gas from Somali region which will be around 4.9Billion m^3 of accumulation which will enhance our LPG production from the domestic use that will solve all foreign currency, availability and affordability issues.

4.3.3.2 Job Opportunity and Entrepreneurship LPG is currently a private sector driven industry in Ethiopia that generates a sizable number of career possibilities and business ownership. Subsequently the enhancement of these sector will future becomes one of the major Entrepreneurship field and create vast and diversified job opportunity.

4.3.3.3 Modernization and industrialization effect. We have described different demographic factors that play great role that result high demand factors in the literature review coverage. Along with the expanding demographic circles, Addis Ababa households have a huge and unfulfilled potential. in Addis Ababa following the essence of modernity with the need of efficient and healthy cooking environment and growing demand of LPG as a raw materials to different small medium and large industries.

Respondent from retailer "I have seen a lot of vehicles that work through LPG in Egypt, which are energy efficient and fuel saver, am very surprised"

4.3.4 Environmental: in the theoretical literature review it is widely discussed the different aspects and benefits of LPG in environmental section**.** Optimistic Green Energy effect LPG is one of the best option for effectively replacing wood and charcoal for a large part of household and industry energy in Addis Ababa, and potential source of energy for the Sustainable development goals by 2030, including Access to Energy, Climate Change and Health. Even though LPG is nonrenewable, it is one of clean and sustainable means of energy and can have a significant positive influence on a variety of key sustainability variables, including as reducing GHG releases, deforestation, and the number of deaths per year brought on by internal pollution. The evidence of the combined emissions of a given operation from the manufacturing and use of LPG, as well as the everyday consumption for the user, is negligible, and the actual carbon dioxide release from using LPG in cooking are very low, and its magnitude is lower than compared to all the alternatives like kerosene and solid biomass fuels. By moving from wood to LPG, there is a 60% to 70% chance of reducing carbon emissions. Again the current high rate of deforestation and climate changes is highly linked with the use of wood fuels and charcoal. Utilizing clean fuels in place of ordinary techniques like LPG and technologies will improve health especially respiratory related diseases, the monetary loss of these premature deaths.

4.3.5 Geographical settings: Urbanization Adoption and use seem to be more prevalent in urban areas like Addis Ababa, where the population is dense and supply system points are more available and feasible for more people. Additionally, Addis Ababa's average income levels are higher than those of other sub cities and per urban areas. The access of getting charcoal and wood fuel in Addis Ababa is less than other parts of Ethiopia and relatively low logistic cost from refilling stations, which leads to use of LPG more competitive.

Respondent from Importers and Distributers " Even though we are considering the population potential, in Sudan and in Kenya the daily consumption is 1000 ton, but in Ethiopia its very low".

The capital of both Africa and Ethiopia, Addis Ababa, with the high growing rate populations and boosted economic activities, plan to make urban living style with international standards with modern life style and healthy living environment by replacing traditional forms of fuel. This plan will be successful by implementing efficient and healthy source of energy. They will be replaced by effective, healthy, safe and environmentally friendly energy sources like LPG in aggressively manner by the government, which is the major target to build the standardized urbanization of Addis Ababa with healthy and environmental friendly energy sources across the city. Considering this LPG usage and business in the city will have greater support and follow up by the government result in high opportunities for those who will join the Distribution Process and also to boost their business for those who are in the distribution process chain.

4.3.6 Societal : Increased consumption of LPG and implementing effective distribution capabilities could contribute to enhanced individual life status of the city residents, Regardless of security, wellness, and time savings, reduced poverty and a particularly better condition for women and girls, who are primarily involved in the fuel collecting and cooking processes are two goals that are particularly important.

By taking into account that most end-user homes and businesses in Addis Ababa have conservative consumer preferences and little knowledge of the advantages and safety, With a planned, sustainable and long lasting efforts by the different participatory shareholders of the Distribution process with regard to Information and promotion focusing on high efficiency, being secure, much healthier, and cleaner will enhance up taking the consumption in higher level and create a considerable amount of opportunity for supply chain members.

4.4 Discussion

The main purpose of the research was to explore the distribution process of Liquefied petroleum gas in Addis Ababa city. The study tries to explore the current usage status of LPG, the different challenges faced in the distribution process from importation to end user, the future smooth operation and distribution opportunity in this effective energy source area and suggest the necessary measurement to be taken. The study's use of qualitative research techniques was a good fit for achieving the general and specific objective of the study in accordance with the raised research questions by considering the listed limitation on the study.

Based on the findings Addis Ababa, the capital city of Ethiopia and Africa, the home of different international citizens and conference, the and country economic hub faced with high scarcity of energy sources, and can't get the competitive advantage of these efficient, environmentally friendly Liquefied Petroleum gas energy source unlike other cities and countries with high level of imbalance between demand and supply. The distribution process of LPG in Addis Ababa is surrounded by a lot of challenges and hustles from importation to addressing end user.

Shortage of foreign currency for Importation process is a very big challenges for Importers and Distributers. Most of the respondents from importation and distribution companies agrees about shortage in foreign currency. Currently it's observed that the government gives special attention for this business and put the LPG product as first priority list for foreign currency permission. Even though the government is working on such issues, most companies from import implies still they did not experience any tangible, actionable and significant action on the ground.

Absence of terminal storages services at the ports also have huge impact on the purchasing power of importers and put limitation on their working capacity.

Absence of wider and standardized Warehouse is another challenges faced by most of wholesalers and retailers, which have significant effect on interruption of supply. Even though such issue raised mostly by wholesalers and retailers, respondents from importers didn't consider it as sensitive matter.

High Cost of transportation from importation up to end user delivery becomes another difficulties that comes consequently after absence of terminal storage service for importers. Even though port Sudan is the only service provider for terminal storage in small scale it came up with long Journey while compared to other ports and let the importers to came up with high cost of transportation, which intern have high impact on price incremental on the end users. Again since the size of cylinders are large and takes much

space it takes high redundancy of routines for delivery of the LPG to the end users, which intern results in high cost of transportation.

Poor Infrastructure condition like uncomfortable roads, frequent interruption of electricity power at the filling plant have also huge impact on delaying distribution process of LPG product.

Absence of strategic location for accessing end users, inadequate and unstandardized Communications means through supply chain members and insufficient support from channel members especially from upstream supply chains to the downstream makes obstacles to the effective distribution process.

Low level Intensity of Investment by potential participatory bodies due to fear of shortage in the supply and experienced low level return of investment due to high operational cost, put those participatory from high level of investment on their company and let the importation and distribution process to be seen in suspicious way.

Absence of Skillful workforce and bad service quality are also another challenges experienced with both the suppliers chain and customers side. Most of respondents are informing that such issues makes the distribution process hard, but also there are respondents as they don't agree with such issues and replied as they have organized different technical and customers service officers to effectively handle to different issues that arises from customer side and respondent from the customers side also give accreditation for some companies for their effective services.

Unhealthy competition and poor cooperative culture between participatory parties in the distribution process have put significant negative effect on effective distribution of the LPG product. Most of the respondents implies it's very difficult to highly participate in the business due to absence of cooperation and limited support. Respondent from Wholesalers and retailers implies Even though some one has potential regardless of financially and fulfill the necessary requirement need to participate in the supply chain the upstream channels member's shows less commitment. In the contrary the study shows there are respondents which experience positive implication towards healthy competition and good cooperative culture with compitators and participatory supply chain members.

Illegal activities like Cross filling and decantation becomes one of the major obstacles for effective distribution. It's mostly observed on wholesalers and retailers and this actions have a high risk for causing gas leaks and explosions, which would cause significant harm to both property and people's lives. There are also some case brought to court through refilling of another brand cylinders even though one party assume the action as helpful for customers to tackle the shortage of gas due to cylinder issue.

Absence of standardized rules and regulations from the government, complicated Bureaucratic works and absence of supportive measures like tax subsides also becomes hustles for the distribution process. Currently Ethiopian Energy Authority is responsible for only Accreditation of LPG start up and technical investigation of the materials. Aside from this responsibility there is no regulatory body which follow the distribution process.

Low level of Knowledge and Awareness through the customers or end user about safety issues also have high impact on the potential consumption of LPG. Fear of explosion risk, Misunderstandings and misconceptions among customers prevent the end users not to shifting to LPG product, in contrast let the end users to stick on traditional means of energy.

Absence of peace and security in the east Africa, and in Ethiopia are another critical issues and are major challenges faced in the distribution process which creates supply interruption and high price inflation, which leads to in availability and in affordability of the product and forced the end user to look forward other means of energy.

Even though the distribution process is experienced with such challenges there is high level of population with High Potential demand of energy source form the city due to urbanization, Modernization life style and highly growing industries especially in the field of hotel and restaurants, coffee roasters and metal industries is good opportunities for supply chain to widen the business.

The focus point of government in greenhouse effect, green legacy, planning of environmentally friendly, non-hazardous energy source and the need of enhanced woman's and children life style with the current given priority for Foreign currency permission list gets the opportunity for future increase demand of reliable energy source LPG and effective distribution process.

LPG product with effective distribution environment has vital role for reduction of deforestation, carbon emission and respiratory related health problems which result in highly reduced rate of deaths due to environmental and indoor pollution which was heavenly affect women's and children's.

CHAPTER 5

SUMMARY AND SUGGESTIONS

5.1 Summery of the findings

The generalized recap from Discussion and Interpretation shows that, LPG is one of the most efficient and reliable source of Energy. Even though Addis Ababa which is the capital city, most populated and the country economic hub have big potential and high demand for the consumption of LPG, the Distribution process is surrounded by different challenges from importation to accessing end user. The major challenges are explained as follow:

- Foreign currency availability for Importers and Distributers for LPG and its accessories becomes a big challenge for the availability and affordability of LPG, and hold the potential participatory bodies to don't go further.
- Absence of terminal storage services at ports highly affect the effective importation process and makes the product costly and interrupted supply.
- The Importation and distribution process is controlled by very few companies and since they don't put much effort on their material asset like importing cylinder, bobtail cars and low investment on their storage capacity result in interruption and shortage of LPG in the city.
- The distribution process is experienced with full of supply interruption, thus distribution process in the middle level and down ward streams are forced to face illegal activities like Cross filing, and decantation.
- Absence of cooperation culture between some of potential distribution participatory bodies makes the distribution process rough.
- Absence of awareness through the society in the safety issues and small effort on the supplier's side on awareness creation becomes the obstacle for incremental usage of LPG.
- Over rated Price fluctuation and interruption of supply forced the end user to look another source of energy and make LPG as alternative.
- The government didn't take fundamental measurement steps to enhance and support the business, and no specific rules and regulations have not been made yet regardless of distribution process.
- Absence of stability in the east Africa region and local areas becomes challenges of distribution.

Beside these major challenges the Distribution process have optimistic future, while considering the high economic growth, modernization, environmental and health attention of Addis Ababa city.

5.2 Suggestions

1. Individual LPG Marketers starting from importers to low level retailers should comply and obey the rules and regulation of the energy policy and must be supportive for the implementation of regulation in each step of distribution process. Additionally, Distribution participants should make an effort to raise safety awareness among their channel partners during their supply chain and hold sessions to inform them of the laws, regulations, and ethical standards will lead to a distribution method and successful, sustained market growth. Subsequently, raising awareness and educating people about safety issues can significantly reduce the number of accidents and eliminate common untruths and misunderstandings about it.

2. LPG marketers must put high effort on informing their clients on how to use LPG safely through safety awareness programs and regular training. LPG must be made more widely known as a clean and safe alternative. Programs for customer based training should be part of any firm offering. Training sessions, conferences, urban activation programs, the distribution of safety awareness leaflets, and seminars on accident handling skills should all be a part of these initiatives. To inform the community about the safe and advantageous uses of LPG, technical specialists from LPG firms will visit end-user customers.

3. LPG marketers should actively engage in technical advancements and build businesses that develop software and advanced metering systems for the LPG percentage information. Through developing research centers for the industry or opening their door for those technological and research developing companies for integrated work like pay-as-you-go (PAYG, in Tanzania and Kenya), which is useful for upgrading the industry and increase the profit of these energy source for every participant bodies and get economic advantages like developed countries. By improving safety along the LPG value chain and tackling barriers to market adaptation and the distribution process, technical innovations can be an efficient for addressing safety issues.

4. A policy framework that encourages investment must be implemented for an LPG supply chain to run efficiently and for actors and investors in the supply chain to make the necessary capital investments. In order to maintain the market growth of LPG in Addis Ababa, there needs to be efficient financing across the supply chain, comfortable conditions for a safe, banking-oriented LPG sector, and stimulation of the necessary infrastructure investment.

5. All parties engaged in the distribution, control, and usage of LPG should be aware of the safety risks and potential solutions in order to promote higher fuel use and supply network investment.

6. There must be effective clear, consistent, facilitated and long lasting Communication should be implemented. The supply chain is being worked on by multiple LPG players, and there must be efficient means of controlling the feedback loop.

7. A transparent regulatory framework for investments should be in force and appropriate regulatory law enforcement for all participant distribution channel members starting from importers to end users across Addis Ababa. To maintain public safety and to provide Distribution participants the confidence they need to participate, LPG laws must be very clear. This will enable them to make the fair profits and return on investment they need.

8. Supply channel members must have strong and legalized property rights associated with their cylinders, in relation to their distribution network on the policy frame.

9. It is important to establish and uphold national standards of excellence. Any breach must result in monetary fines and, eventually, the revocation of their licenses. To prevent harmful activities, the policy framework should also assign responsibility to LPG marketers for their own distribution systems and cylinders.

10. Governments should construct a combination of quantitative and qualitative a set of key performance indicators to track, assess, and report progress in the growth of the LPG market and its effects on the economy's development in light of their efforts.

5.3 Directions for further research

This study mainly focuses on exploring major challenges and opportunities distribution process specified in Addis Ababa. Further study details can be carried out on the areas of

- ✓ Expanding other different potential cities and country level,
- ✓ Quantitative studies can carried out which specific factor is majorly challenge the distribution process, and necessary measurement that could be taken
- ✓ Analysis of feasibility study on potential energy sources alternatives in urban and rural areas
- ✓ Research studies on distribution process and getting competitive advantage, comparing with other potential and experienced countries in the field of LPG

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INTERVIEW

Dear Participant of the interview,

I would like to thank you for your corporation to be interviewed for the thesis work of the title “

Exploring Distribution Process and Customer Experience: the case of Liquefied Petroleum Gas in Addis Ababa”

Your participation highly supporting the success of the study. All responses will be kept Confidential. No attempt will be made to identify individual respondent.

Completing the interview will take about 30-60 minutes. Thus, you are kindly requested to have your utmost patience in spending your time to complete the interview, as your contribution has great value to the study.

Thank you for taking part in this interview.

With Regards,

Hailu Ayalew

AAU, Collage of Business and Economics

MBA Department (Management Stream)

INTERVIEW AND QUESTIONARIES

1 Interview: Selected questioner samples Petroleum policies, laws, regulation

1. Which ministries are in charge of LPG, environment and internal trade?

2. What is the role of the current minister in facilitating LPG distribution?

3. Are there any specific policies, laws and regulations governing petroleum supply?

4. What are the regulations so far implemented by the responsible minister?

5. How have the regulations been followed by the LPG distributors?

6. What has been the challenges that this ministry has been facing in relation to policy crafting, regulation, sustainability, and ethical issues related to LPG distribution?

7. Is there a body responsible for standards and also environment?

8. Are there any standards for LPG? If there are no standards, why?

9. How have the standards been implemented so far? Have they standards achieved their intended purposes? If not, Why?

10. What is the tax structure for petroleum products and LPG in particular? How has the tax structure facilitated/hindered the petroleum distribution?

11. Are there any past studies done for the government on LPG? How has it been helpful in setting policies/regulations, and so on?

12. What is the Government's position and motivation for promoting/not promoting increased use of LPG?

13. Which measures does the government apply in order to promote use of LPG? (Such as

VAT exemptions, subsidies, etc). What are the reasons for these selected government support mechanisms? How have it been successful so far? What has been the challenge?

14. Can you explain the illegal activities observed and how do you deal with it in the distribution process?

2 Interview: Importers and Distributers

1. Can you introduce your company background? (Date of establishment, how many years on the business, company type)?

2. How do you explain the current aspects of LPG business in Addis Ababa its addaptivenes and acceptance in the market? To what extent do large industries, small and medium-sized enterprises, such as restaurants and workshops, use LPG?

3. How do you explain availability and consistency of the LPG supply in the market and challenges faced regardless of LPG supply in the market?

4. Can you describe briefly how the LPG business supply chain and distribution process is organized from import to the final consumer or end users? And challenges you faced in the distribution processes?

5. Can you explain your opinion on the challenges your company faced regardless of logistics materials and your company status regardless of logistics availability (Depot, transportation cars)

6. How do you explain institutional culture in the LPG distribution process business? (Other brands, government bodies)

7. Can you explain the illegal activities observed and how do you deal with it in the distribution process?

8. Can you explain the main barriers in the distribution process on increasing the use of LPG from the customer side?

9. What is your opinion on what should the government do to help guarantee effective distribution process of LPG?

10. How do you express the future opportunity in the business?

3 Interview: Whole sellers and retailers

1. Can you introduce your company background? (Date of establishment, how many years on the business, company type)?

2. How do you explain the current aspects of LPG business in Addis Ababa its addaptivenes and acceptance in the market? To what extent do large industries, small and medium-sized enterprises, such as restaurants and workshops, use LPG?

3. How do you explain the role of suppliers in the distribution process? Inconsistency of supply of gas (Shortage or Excess) and their necessary support?

4. How do you see the overall LPG distribution process regardless of marketing perspective (Price, location, promotion and product)?

5. How do you deal with warehousing and logistic/ transportation affect the distribution process?

6. Can you explain the illegal activities observed and how do you deal with it in the distribution process?

7. How do you see the availability LPG cylinders accessories materials and effects on the distribution process?

8. What is your opinion on compitators marketing and distribution process with regard to healthy competition of LPG business?

9. How do you see technical assistance, information sharing and business support from the suppliers in the distribution process and customers compliant times?

10. How do you measure the awareness status of customers and experience in the business (awareness, trust, security and purchasing power)?

11. Can you explain the main barriers in the distribution process on increasing the use of LPG from the customer side?

12. What is your opinion on what should the government do to help guarantee effective distribution process of LPG?

13. How do you express the future opportunity in the business?

4 Interview: Customers Interview

1. How do you see the LPG product in the market, what benefits have you experienced in relative to other energy sources (Electricity, wood, charcoal, kerosene……)?

2. What is your opinion about the availability, affordability and cost effective of LPG product in the market?

3. How do you see the service quality of LPG distribution process? (Delivering time, compliant response time, support of technical professional in the business)?

4. How do you see the availability of LPG accessory materials and installation cost?

5. What illegal activities have you noticed in the distribution process and how you are dealing with?

6. Can you explain the main barriers in the distribution process on increasing the use of LPG from your perspective?

7. What positive implication have you seen in the LPG distribution process that makes you comfortable and more usage in the business?

8. How do you see the future opportunity of LPG usage with your consumption for your specific field?

Quotations from the respondent

Category	Respondents	Quotation
Gov't Official	Respondent 'A'	# "we have the responsibility of to check the technical assurance of companies and give competency license through our technical team of Electrical, civil, mechanical and petroleum engineers, as the LPG companies full fill the necessary standards regardless of their materials and guided by international standards, and as they satisfy the Ethiopian charter 838/2014 for starting LPG business. We don't have heard any complain on illegal activities performed in the distribution process and it's also not our responsibility, whenever such dispute occurs it will judge by local courts, all the retailers' license is approved and given by local trade bureau in their respective areas." # There is good news from the government that there will be surplus production of natural gas from Somali region which will be around 4.9Billion m3 of accumulation by one Chinese company, which will enhance our LPG production from the domestic use that will solve all foreign currency, availability and affordability issues".
Importer and Distributer	Respondent 'F'	# "currently the price of LPG in Addis Ababa is around 190birr up to 200birr per kg of the product, which is very expensive in which we can compare to Khartoum town current price which 10 birr-15 birr per kg" # "Previously we were renting terminal storage at Sudan Port and capable of purchasing large bulk amount of LPG product from suppliers in a range of full ship size, we store it and we were effectively supply the Distribution supply chain without interruption and cheap price like 34 birr per kg of the product. After sawing our effective operation the government of Sudan quite our agreement for terminal storage and start the Importation storage and distribution by itself" # we have tried to work on increasing storage capacity of the depot but since these huge size tankers need more space to each other and the expanding nature of the Addis Ababa to our storage depot (Dukem), which contradict to the safety issues of the city make us limitation our capacity to only 300MT".

Importer and Distributer	Respondent 'F'	# Most of them remember gas line after finishing all the building process, there is not that much consultant company which skillful and professional on these areas like different structural, electrical and sanitary designs. # "even though the government gives LPG as priority for undertaking foreign currency currently we are not getting enough foreign currency for importation, the foreign currency priority is still theoretical."
	Respondent 'G'	# "we are idling more than 15 modernize cylinder filling machines because of shortage of gas and we are working below our operation capacity". # "price fluctuations in the international market, current economic trend and the current incremental cost of logistics cars fuel becomes the major reasons for dramatically price increase. #"Even though we are delivering the cylinders to the customers through sales based as in the CCCM model based whenever there is any safety issue happened on the cylinder we always care as it is our brand mark" # "it's well-known that we are one of the bulk suppliers in Ethiopia and Addis Ababa, in which we dispatched more than 700,000 cylinders across Ethiopia, but unfortunately we are facing illegal cylinder Controbanding activities to Eretria, which seriously affect our distribution operation and our country economy." # "Even though we are heavenly working on exporting products we are not having enough support and attention form the government regardless of the foreign currency as expected."
	Respondent 'H'	#"currently we are covering 11,000MT to 12,000 MT of supply out of 15,000MT usage in Ethiopia, by importing and distributing to our partners and retail out lets. # "even though we encounter different economic hardships, lack of peace and security especially Sudan civil war makes everything hard ". # " we give the most affordable price for our customers but the big problem is we faced is cost of transportation we encounter from Sudan port to Addis Ababa which is around 1900km, which is costly when we compare if we take alternatives like Berbera - 900km, Aseb and Mitsewa - 953km, and Djibouti which is 928km". So the cost that we

	Respondent 'H'	are required to work on Sudan port is twice as much as if they use from other ports. # "we have given best location based strategies to overcome the location issues in our outlets as by dividing Addis Ababa in to Four Regions as East district from 22 area to Hayat, West District from Lideta to Jemmo, North District from Addisu Gebeya to sululta and south region from Saris to kality, and tries to reach every corner of the city as much as possible. # "since our company is foreign we have not that much big deal issue with foreign currency, especially the government give us special support in the importation of last two shipments." # East Africa Is in trouble, Sudan is at war, Ethiopia is at war, Ethio Sudan border is very dangerous territory, and ways to enter Addis Ababa is mostly closed due to security issues" # "we are charging additional payment for military convoys, our drivers are working at high risk, in the nearer time two of our Trackers were under attack.
Importers and Distributers	Respondent 'I'	# "Currently there are limited Importers and Distributers in the field and we have worked in a collaboration way and have a good relationship with other brand suppliers". # We have organized technical team and try to solve any problem faced by our customers".
	Respondent 'J'	# " Even though we are considering the population potential, in Sudan and in Kenya the daily consumption is 1000 ton, but in Ethiopia its very low". # " when we see the 2020 data Hotels Restaurants factories and households were the potential customers, especially coffee roasters are bulk takers".
	Respondent 'J'	# " I can see the importance of the LPG with regards to cost wise price relative to effectiveness, time wise which is the time usage and Quality wise which is the materials itself". # "In other countries there is a 'uni' law which says no other brand can refill other brand cylinders".
		# "we are not getting any accessories materials from importers and

Wholesalers and Retailers	Respondent 'U'	wholesalers, whenever they imported accessories they give to some personals that looks like there is some personal chain with the managers of importing company, I doubt!!!" # "it's very hard to compete and also to create more close relationship with another wholesalers and importers and distributers, I have been tried too many times to get dealership or being agent relationship with the potential Distributers by fulfilling all the necessary criteria's needed (financial ability, necessary infrastructures), but the business or distribution process looks corrupted and works only through personal chain and incentives method, that's really hurting and we are forced to re bounce and doesn't have any motivation from the working structure." # "when we check the net weight of filled cylinders from some distributers we always encounter loss weight, and give us the reason of error from cylinder measurement machine, but we all knows that there are some fraud action with knowingly, for example if the person who fill the 12 kg cylinders might fill 11kg each of them and fill 12 pieces of he can easily stock one 12 kg cylinder and when we consider in the price it will be average of 2100birr, this is very serious issues as we wholesalers and retailers lose customer trust by fault kg measurement, so am forced to take my own measurement tool for confirmation of each cylinders, which really affect mine time for checkup and transportation cost. # "I have seen a lot of vehicles that work through LPG in Egypt, which are energy efficient and fuel saver, am very surprised"
	Respondent 'V'	#" I have never seen a time when LPG distribution process is smooth throughout the year, its common to see shortage of LPG like 3 months throughout the year". #" I say its slow and smooth increasing of price unlike other commodities, I can say that it's not that much exaggerated". #" Crowded roads and lack of sufficient empty cylinders are the major problems for effective delivery process". # "We don't have that much sense of rival, and also I didn't see cooperation behavior also". # Most of the customers are full of fear about gas and consider it as

Wholesalers and Retailers	Respondent 'V'	deadly matter". # "currently our company don't support on safety materials issue, no safety cloth, no safety shoes, no gloves in site areas. The government should focus on such issue and prepare some enforcement rules".
	Respondent 'W'	#" due to shortage and price fluctuations customers gets bored and looking for another means of cooking like Electricity". # Accessories like regulators once failed they cannot repaired easily, even though they are good in quality, but the technical awareness of the customers is low its can be failed".
	Respondent 'X'	#" due to the high price increasing now day's households discarded the cylinder gas and currently hotels and different industries are the one who can afford and purchase by considering their profit by using LPG." #" If the Accessories damage is from our side, we will change. And there is enough stock regardless of accessories materials". #" The business is very potential in the city but because of its not produces locally and nee foreign currency it is difficult to easily get".
	Respondent 'Y'	#" the customers come with a long time and after they came up due to the big price difference in our station they don't buy". # " We didn't get the product whenever we want, I think it's either it takes for them long time to deliver the product or there is shortage of gas from suppliers, we only get the gas whenever they want".
	Respondent 'Z'	#" In my shop there is good sales than other branches and all customers have knowledge about the gas".
	Respondent 'M'	# "I have been in different countries for work and here in Ethiopia the cost of LPG accessories like regulators, pipes and hoses are four times expansive that of Turkey, and Cameroon, which is very costly and am always surprised" # "am very up sated by distributers, they always gives excuses of delivery car is in garage due to small spare part and the delivery schedule will be delayed up to more than 2 weeks, that's very hard for us since we are factory based on daily KPI and daily production measurement." # I have been working with three different importer and distributer

Customers	Respondent ‘M’	company, and normally since Addis Ababa is at around 2300m elevate below sea level the standard conversion factor from (Liter to kg) supposed to be 0.58, but one of the company is calculating by 0.606 which is illegal and the government should strictly take the necessary measurement since they are charging money without the standard.” # “LPG is very fast in terms of cooking, which we need prominently as we are food manufacturing industry.”
	Respondent ‘N’	# I have been working in this hospitals for the past 7 years, we have been one of the potential users of LPG product for cooking purpose of our patients, we have been working with one potential supplier and am always pleased by their service quality like customer handling, cooperation and so on except delay of delivery time of the product but since we are dealing with patients of hospitals its very serious issue for us.”
	Respondent ‘O’	# “Due to shortage of LPG gas we are in high trouble and eagerly seeing any other energy source opportunity like electricity even charcoal and to replace our machines “. #" Always there is shortage and high price increase every time we want".
Customers	Respondent ’P’	# “to be honest the price inflation of LPG is very unreasonable and as of my side am stopping using, I can’t purchase one 12 kg cylinder by 2500birr, I can’t afford and not logical for me. Am taking cylinder gas as back up for my electricity interruptions only.” # there is no technician available and whenever we faced problem with the accessories we will try by ourselves".