

**Report On  
Internship at Islam Oxygen Limited**

By

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17304044

An internship report submitted to the BRAC Business School in partial fulfillment of the requirements for the degree of Bachelor of Business Administration

BRAC Business School  
Brac University  
May 2021

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## **Declaration**

It is hereby declared that

1. The internship report submitted is my own original work while completing degree at Brac University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

### **Student's Full Name & Signature:**

**Raihan Islam**

**Student Full Name**

Student ID: 17304044

### **Supervisor's Full Name & Signature:**

**Sang H. Lee**

**Supervisor Full Name**

Professor of Finance & Dean, Brac Business School

BRAC University

## Letter of Transmittal

Sang H. Lee

Dean,

Brac Business School

BRAC University

66 Mohakhali, Dhaka-1212

Subject: Submission of Internship Report

Respected Sir,

I am thankful to you for allowing me to do my internship report on Islam Oxygen Limited. I was assigned to write this report for the completion of my Bachelor of Business Administration degree from BRAC University. I had come across numerous challenges and experiences in the process of writing this report. I have learnt a lot in the duration of this internship program, which will be invaluable to my career in the future. I had completed 3 months of the Internship Program at the Tarabo factory of Islam Oxygen Limited. I hope you will find my report satisfactory and according to your instructions.

Sincerely yours,

Raihan Islam

Student Full Name

Student ID: 17304044

BRAC Business School

BRAC University

Date: May 30, 2021



## **Acknowledgement**

I would like to thank all my faculties at BRAC University for all the knowledge they had given to me. It would be impossible without their teachings and wisdom, for me, to complete this report. I am very grateful to my faculty Professor Sang H. Lee, for giving this opportunity and guidance to complete my internship report. I had also attended finance classes under him, being a finance major, and was inspired by his unique point of view on the subject.

I would also like to thank all the employees at Islam Oxygen Limited for the excellent cooperation. In addition, I had received constant support from the Senior Manager of Accounts and Finance of the Islam Oxygen Limited, Md. Rashed Mosharaf, who was my on-site supervisor. I was fortunate enough to be able to interview high level employees at the company and would like to acknowledge them as well, especially Mr. Mustain Billah (Chief Executive Officer).

I would also like to express my gratitude towards the people at M/S Islam & Brothers for providing relevant information to me regarding the market. Lastly, I am also grateful to all the people who took the time to fill up my survey questionnaire.

## **Executive Summary**

In this report, I have explored various aspects of manufactured oxygen, starting from my experience at Islam Oxygen Limited, to the history of the company and the market, ending with an analysis of the present capacity the nation of Bangladesh has and its implications in the case of a disaster. The main body of the report is separated into three chapters, the first being my experience Islam Oxygen Limited, the second being the overview of the company itself, and finally, on the third, ending with a research on what might happen if the pandemic gets worse and the capacity of oxygen production.

I had cited various newspaper articles, and other published papers to base my report on. I had chosen this specific topic as I know firsthand that the pandemic had in fact largely influenced the sale of medical oxygen from my time with IOL. I had also looked into how other sectors were affected by the shortage caused by increased medical demand. I hope this report comes to good use to someone.

**Keywords:** Oxygen; COVID-19; Manufacturing; Bangladesh; Medical; Gasses;

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## **List of Acronyms**

IOL	Islam Oxygen Limited
CEO	Chief Executive Officer
COO	Chief Operations Officer
AOL	Associate Oxygen Limited
BBA	Bachelor of Business Administration
BBS	BRAC Business School
MD	Managing Director

## Glossary

### Thesis

An extended research paper that is part of the final exam process for a graduate degree. The document may also be classified as a project or collection of extended essays.

### Glossary

An alphabetical list of key terms

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Use one table row for each item to allow sorting using Word's table tools.

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# **Chapter 1**

## **Internship Overview**

### **1.1 Student Information**

**Name:** Raihan Islam

**ID:** 17304044

**Program:** Bachelor of Business Administration

**Majoring in:** Finance

**Minor:** Supply Chain

**Department:** BRAC Business School

## 1.2 Internship Information

### 1.2.1 Company Information

**Company Name:** Islam Oxygen Limited

**Job Placement:** Internship

**Period:** 3rd February 2021 to 29th April 2021

**Department:** Accounting and Finance

**Address:** 11/1 Tarabo, Rupgonj, Narayangonj, Dhaka

### 1.2.1 Company Supervisor's Information

**Name of Supervisor:** Md. Rashed Mosharaf

**Position:** Senior Accounts and Finance Manager

**Email address:** [gm.accounts@iol.com.bd](mailto:gm.accounts@iol.com.bd)

### 1.2.3 Job Scope

I was assigned to work in the accounts and finance division under the supervision of senior manager, Md. Rashed Mosharaf at IOL. My responsibilities these included daily tasks like logging in physical vouchers into the company database and check for in discrepancies in the previous night's bills entries. Other than that, I was assigned to assist in the process of accounts reorganization which is still in progress at IOL. This included large tasks like communication with different divisions to gather data and organize them for use. I also aided in the process of paying government dues every month.

## 1.3 Internship Outcomes

### 1.3.1 Contribution to the Company

I believe I had put in a lot of effort and diligence into my work at IOL. Being my first full time service experience, I had tried my best to leave a good impression on my employers. I had not

missed any of my work days, despite the COVID-19 situation at the time. While I cannot verify my own performance there, I had no complaints or sense of dissatisfaction from anyone while I served. I may not have had much of an impact on the company, but I made sure to complete my assigned tasks and perhaps even take some of the load off of some regular employees in my department.

### 1.3.2 What I Had Gained

Working at IOL gave me a good perspective on how a company operates in Bangladesh. I got to experience the office culture here firsthand. My supervisor had gone out of his way to show me the workings of the company and how the finances are managed to run such a company. I was lucky to have gotten this opportunity. I have a deeper understanding of how a company actually runs now. A lot of misconceptions were dispelled from my mind. In addition, being situated right beside the actual oxygen plants, I had the chance to observe how all the gasses were manufactured, bottled and shipped. I was also lucky enough to observe how the paperwork for importing materials are processed.

### 1.3.3 Difficulties

My internship period was a little difficult in comparison for two main reasons. The first being that the location of the factory is 16 kilometers from my place of residence. That may not sound like much, but factoring in for Dhaka traffic, it was very time consuming and expensive for me. The other difficulty I faced was the COVID-19 pandemic. It was more difficult to do basically anything given that I had to take safety precautions. Also, transportation becomes exponentially more difficult under those circumstances. Other small issues like were present, but not worth mentioning as they were mere occasional inconveniences.

### 1.3.4 Recommendations

I do not have any recommendations other than maybe taking on more interns at a time. They were very good employers for me, so not much I can say regarding that. But I do believe that they could have more interns. During my time, there was one more intern, but at a different division. I was the only non-regular employee there and it would have been nice to have someone in a similar situation as me.

## **Chapter 2**

### **Organization Overview**

#### **2.1 Introduction**

I am analyzing the different aspects of business practices in Islam Oxygen Limited and oxygen industry as a whole, for the completion of my BBA undergraduate degree at BRAC University, in this report. I shall be using all the resources at my disposal for gathering and analyzing all the data necessary. I have included my findings from firsthand experience, interviews and analysis of company reports I had access to during my time at IOL.

I believe this report would be able to give the reader a good idea of how the operations of an oxygen manufacturer are conducted in Bangladesh and how this industry as a whole is. I will highlight the strengths and weaknesses of such a company and the challenges and opportunities they may have. I have tried my best to collect all the data that was possible for someone at my level. However, keep in mind that I am not an expert in the field and I am under restrictions from the acquisition and usage of certain data from IOL. Also, I could not get hold of all the people that I would have liked to, due to various difficulties.

This report would be significant as the compilation and breakdown of such data in this specific industry is rare and difficult to come across. My work may one day help someone to understand the company and the industry better and help make more informed decisions regarding them. This could also be used by IOL itself to raise awareness regarding the company or industry.

#### **2.2 Overview of the Company**

##### **2.2.1 About Islam Oxygen Limited**

Established in 2009, Islam Oxygen Limited had experienced tremendous growth throughout the years and amassed massive response from the market, being selected as preferred gas vendors for the numerous reputed hospitals and other industries. The company is owned by a board of directors and the managing director Mr. Nurul Islam, had been managing the concern



since its inception. They compete by focusing on high quality products and differentiate in the marketplace through strong knowledge of the industry and outstanding customer service.

Islam Oxygen Limited is the endorsed medical gas provider for most of the reputed hospitals and healthcare organizations and supply medical gases to hospitals across the country. They also provide nationwide coverage for industrial gasses as well. Their production includes gasses such as Oxygen, Carbon Dioxide, Nitrogen, Nitrous Oxide, Argon, Dissolved Acetylene and Medical Compressed Air. They also mixed gasses like Argoshield, Corgon, etc that are a mixture of gasses, assembled on site. In addition, they also supply imported gasses like Helium, Hydrogen, etc. Besides gasses, IOL is a supplier of medical hardware, such as valves, fitting, accessories, etc, and also provide pipeline construction services.

Islam Oxygen licensed by the Directorate General of Drug Administration (DGDA) under the Ministry of Health & Family Welfare and the Department of Explosive, under the Ministry of Power, Energy and Mineral Resources, Government of Bangladesh. The manufacturing plant of Islam Oxygen is situated at Tarabo, Rupganj, Narayanganj and distributes it throughout the whole country via depots in different locations. Islam Oxygen Drugs Manufacturing License No: 500 & DGDA Registration No: 374 – 001 – 075.

### 2.2.2 Mission, Vision and Philosophy

#### **MISSION**

IOL wishes to establish long-term relationships with their customers and all other stakeholders. They aim to ensure quality service and products at an affordable price. Their aim is to develop and manufacture medical gas formulations in the most efficient manner and ensure the safety, efficacy and high standards of products.

#### **VISION**

IOL's vision is to meet local medical, industrial and specialty gas demands, to ensure the health and safety of all employees, contractors, suppliers, customers, visitors, and become the leading gas manufacturing company for Industrial and Medical Supply.

#### **PHILOSOPHY**

By producing quality full products and services, Islam Oxygen Limited always helps their clients achieve and maintain optimum standards in the healthcare sector. IOL is always

committed to serving their clients with utmost integrity and safety, keeping in mind that their business is not only to profit but to also benefit the nation. They believe in innovating and introducing new technologies to the customers and other stakeholders. IOL sees the empowerment and development of people as part of adding value to society and acts accordingly for the greatest wellbeing of everyone in the long run.

## **2.3 Management Practices**

### 2.3.1 Management Structure

Islam Oxygen Limited is owned by a board of directors. Among them, the MD, Mr. Nurul Islam, is in charge of running the entire concern directly. Under him are the Chief Officers, Executive, Operations and Financial officers. These officers are the heads of their respective departments, which consists of senior and junior managers, managing teams of employees.

### 2.3.2 The Unusual Aspects

Where the company may be a bit different from others would be the fact that the Operations department handles other internal aspect of the company like Information Technology, etc. Also, the Executive department incorporates the sales department, which do not have direct say in the steering of the company. They are simply supervised by the CEO personally. The Financial Department is the same as most standard companies.

## **2.4 Marketing Practices**

### 2.4.1 Marketing and Sales Department

The Marketing and Sales department in IOL consists of the usual members that you may expect in such a department. However, what may be a little unconventional would be the roles of the sales managers. Their roles include both marketing our products and dealing with repeat customers personally. They do not have people dedicated to marketing only as the product itself is not a consumer good. Senior members of the sales team are assigned a role in marketing

the products such as advertising, branding, etc. They do not have sophisticated marketing plans to execute. Majority of their clients are acquired by sales representatives.

#### 2.4.2 Marketing Strategies

Hospitals and industries being the biggest customers of IOL, their marketing strategies mostly revolve around pleasing such companies. They offer special offers such as personal handling, discounts, tours etc to bulk buyers. Modern websites are maintained and promoted on search engines instead of social media or other websites. IOL prints our gifts like company branded calendars, diaries, paperweights, card holders, and much more to present to business partners and their representatives. These items are provided to other stakeholders as well.



Figure 1 IOL Diary and Notebook

## 2.5 Financial Performance & Accounting Practices

### Accounting and Financial Department

The accounting and finance department in IOL was where I was assigned to, for my internship. I was under Md. Rashed Mosharaf, who was a senior manager in the department. He was promoted to head of the department soon after my departure. The department is relatively smaller and consists of mostly accountants and billing personnel.

### 2.5.2 Accounting and Financial Strategies

Most such relative strategies are formulated by the Head of department, and approved by either the board or the COO, depending on its cost or significance. They follow the standard accounting guidelines as the rest of the country and are funded by mostly bank loans and private funds. Their statements and records have not yet been made public and I was not granted access to the draft copies of said statements to conduct further analysis.

## **2.6 Operations Management and Information System Practices**

### 2.6.1 Operations Management

This department is run by Mr Badar Uddin (COO), who had interviewed me for my internship program application. The Operations team include people in the manufacturing process, procurement and most other operational tasks like expansion and building. It is a bit different than most other firms as the COO is also in charge of other internal management tasks such as Information Technology, security etc. However, they are not considered to be in the same department. Mr. Nazrul Islam is the Plant Manager and oversees all the production within the Tarabo factory premises.

### 2.6.2 Information System

IOL has a modern information system and up to date technological features. They used localized and cloud based systems for ensured safety and backup capabilities. They use Quickbook as their primary software. The Information Technology department is the smallest in the company, consisting of only a few people on site. This is mainly because much of the duties are outsourced to other professionals as the management feels that the company does not require a big in-house Information Technology division.

## 2.7 Industry and Competitive Analysis

### 2.7.1 The Industry

The market for gasses in Bangladesh started seeing growth in the early the 2000s with the explosion of steel manufacturing coinciding with the rapid development of the country. The next two biggest companies by sales, Spectra Gasses, Islam Oxygen were soon established later in the 2000s along with other smaller companies. The market leader in gas manufacturing is Linde BD, a company which had its roots in Bangladesh since before its liberation in 1971. It is a multinational company based in the United Kingdom, originally from Germany. Despite its strong presence, other companies are not too far behind in terms of sales. The non-fuel gas that has the biggest market share in Bangladesh is Oxygen. Due to this, most manufacturers usually have Oxygen as their primary focus of production.

Oxygen is relatively easy to manufacture, requiring only power to manufacture. There are no raw material requirements, therefore the variable price mostly depends on the cost of power. However, it does require certain licenses to manufacture gasses fit for human consumption and regulations have to be maintained. Oxygen can be produced in either a liquid or gaseous state. It takes less costly plants to manufacture in gaseous form, but manufacturing in liquid form is more efficient and can be stored in large tanks, unlike the gaseous form.

As of the time of writing this report, there are no manufacturers of cylinders in Bangladesh, meaning all new cylinders of gas have to be imported. This is usually done from China or India, being the most cost effective to ship from. Other gasses like Nitrous Oxide and Dissolved Acetylene require raw materials that are not produced locally and are volatile or explosive. These require additional licenses to import and store, and can be expensive to ship. Bigger industrial buyers require a number of gasses along with oxygen to fulfill their total demand. They seek out companies that can cater to all their needs to save of time and transport costs. Hence, an oxygen manufacturer cannot exclusively sell oxygen if they plan to expand their operation. Industrial buyers make up roughly half the oxygen demands.

## 2.7.2 SWOT Analysis

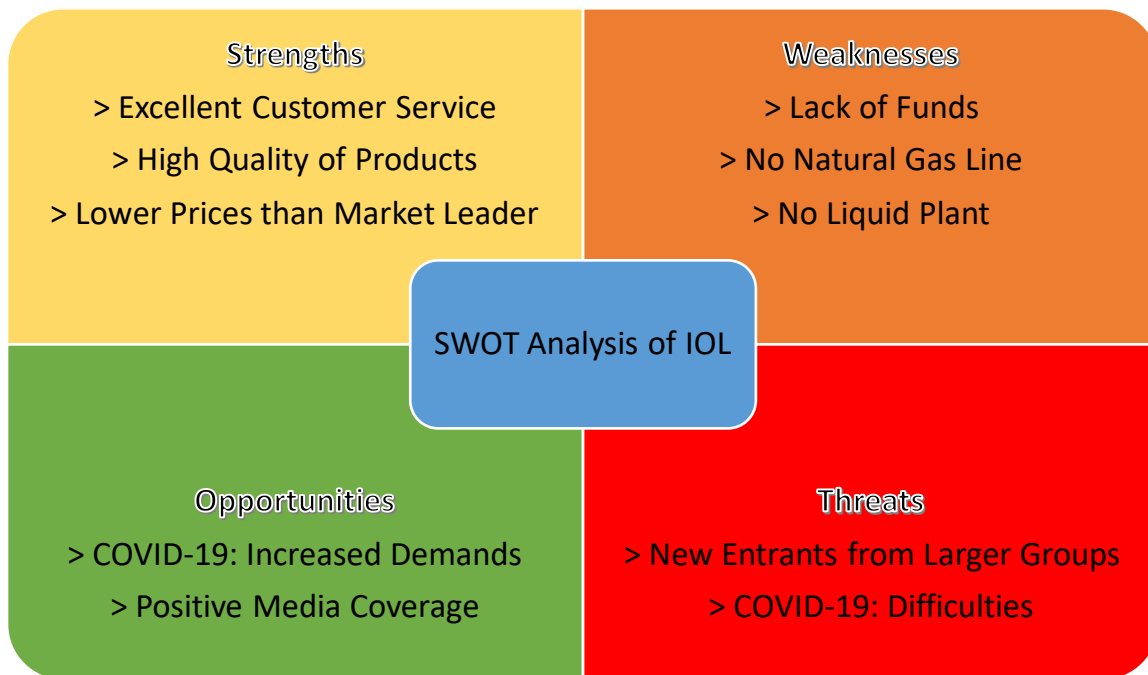


Figure 2 SWOT Analysis on IOL

### Strengths

One of the strong points of IOL is that their customer service is very good. They offer flexibility to their customers like the other big companies are unable to due to factors like bureaucracy and rigid systems. This is further enforced by the fact that the MD himself deals with larger clients and overlooks the customer relations side of the business from time to time. Adding to the excellent service, the reason IOL had diversified into so many different gasses, despite the low volume sales is because of customer demands. Buyer often ask for addition gasses besides Oxygen, Argon and other common gasses. For example, hospitals sometimes need Nitrous Oxide and IOL is able to provide it. The buyer can save on extra transport costs.

IOL ensures good quality control on all their products and maintains certain standards set by the management. Smaller companies may be able to invest more time on customer service, but they do not maintain high standards of quality like IOL. As they deal with pressurized gasses in a regular basis, safety is also important; not just to the workers, but to the buyers too. They pressure test every cylinder to make sure no deformation occurs and the cylinders are safe to use before filling. This upholds the high standards of product. In addition to providing great

product, they also offer great value for product. IOL's rates are usually lower than that offered by Linde BD and Spectra on average. This keeps customer content and allows them to compete successfully in the current market. They have seen relatively healthy growth over the last few years using these qualities and acquire more market share.

### Weaknesses

Other large oxygen producers have natural gas lines which allows them to produce their own electricity. Electricity is the largest variable cost oxygen producers incur, therefore it saves a lot of money generating one's own power. A gas line would cut down electricity costs to IOL by a predicted 18% according to the plant manager. Several applications had been made to the governing body to grant a natural gas line, but due to vague matters regarding to their location, their applications had been denied in the past. However, the situation looks positive for the last time they had applied as positive feedback was received.

Another big weakness of IOL is a lack of funds. Various issues, both external and internal, prevents the management from acquiring funds at a reasonable interest rate. The company had also been going through some internal reforms and attempt at modernization, so the management is delaying further expansion until everything is up to date. This task was also at an end just before I had left them. As a result of this shortage in funds, IOL is unable to establish a liquid oxygen production plant. Liquid oxygen is much more efficient to produce and transport in comparison to the gaseous form. In addition, Argon gas can also be captured with such a plant. This is a huge disadvantage for IOL. Lind BD and Spectra Gasses both have liquid plants in operation. There has also been a shortage of workers due to increased demands during COVID-19. Since everyone has more work load and the reorganization is in progress, the company had decided to wait for a while. They have predicted to have established a liquid plant by the end of 2021.

### Opportunities

It is a sad event the world is going through at the time of writing this article due to the COVID-19 pandemic, but this is an opportunity for IOL to grab more market share. Although the association may be perceived as negative, it is actually a good thing as IOL is saving lives in a

difficult time. The price of oxygen was not raised by them despite increased demands due to ethical reasons. Related to this is the fact that IOL had a lot of positive media coverage in the news and such outlets. This had boosted sales as it was told to me that they were receiving a lot of outside customers that they had never dealt with before, and a lot of recognition and praise. This boosted the company image, making it easier to compete.

### Threats

COVID-19 had presented most companies with a slew of problems such as difficulty to attain labour (lack of transportation, lockdown laws, etc). Other problems such as cylinder and raw material shortage due to restrictions on shipping and other international trade were also faced by IOL. The condition of the economy as a whole in Bangladesh is unstable as a result and it is difficult to predict the financial direction of the company. Another big threat that is always looming over the industry is the threat of entry by a large group of industry or a foreign concern. This trend has been observed in the recent years in many industries in Bangladesh. These multinationals or groups of industries have a lot of idle funds and can take sustained losses and drive other smaller companies to either sellout or shut down. This usually happens if the industry in question is very profitable and/or has weak relations between the producers.

## **2.8 Summary and Conclusions**

Although not the biggest company in the market, I firmly believe that Islam Oxygen Limited has the potential to get the largest market share some day in the future. I say this because the hospitality they show to their customer is very welcoming and their presence in the market grew noticeably even in the short time I was with them. They have strong organization and cohesion within the company, which is difficult to build up in such a firm where brand identity is not as strong of a factor. Although I cannot verify the following details, being learnt from after my departure, I had heard that my on-site supervisor was promoted to Chief Financial Officer upon my departure and also that a natural gas line permission had been granted to IOL. This are positive signs that would give the company an even bigger competitive edge.



## **2.9 Recommendations**

The gas market in Bangladesh is rather sizeable although it is not often represented in the media without events that require immediate attention. Stock market representation is also weak. However, I feel like this industry is going to boom as Bangladesh would aim to reduce its dependency on foreign imports. I would suggest that manufacturers in Bangladesh should tighten up their competitive practices as I believe there are too many smaller firms producing oxygen inefficiently and still breaking even. I am sure some reforms and cooperation would weed out these smaller plants and make the large companies really blossom. The unstable rates would not be a problem then and the larger companies would have more name value than they currently do.

## Chapter 3

### Research Paper

#### How has the demand and supply for oxygen in Bangladesh change during the COVID-19 pandemic?

### 3.1 Introduction

Bangladesh and India are very similar countries in term of socioeconomic conditions. Judging by the inadequate supply of oxygen in India, I think Bangladesh might face similar shortages if the COVID-19 pandemic gets worse. The virus, its spread and potency are unpredictable, hence it is difficult to predict how serious the situation might develop to become. Hence it is important to analyze what could happen if the situation takes a turn for the worse. As of the time of writing this report, the death rates are at an excess of 100 daily, which is nearly double of what the numbers were when the first wave of the virus hit Bangladesh.

In this paper, we aim to see how COVID-19 has changed the oxygen industry and the possible effects this had on other related industries related to the industry in question. We shall be looking at potential shifts in the supply and demand of the gas and their root causes. With the information, we may then speculate how the future of the industry may look, and see how the inflated demands may affect the industry when the pandemic dies down.

This analysis is will help us understand what the full scope of the situation is and the reality of the matter behind the newspaper headlines. It may be of significance to know what could happen if certain factors change in the future by analyzing the present changes. Understanding the possibilities of the situation escalating into something worse can help us prevent potential disasters in the future regarding oxygen manufacturing and learn a lesson before it is too late to do so. Therefore I think that this is an excellent way to possibly curb a crisis before it takes proper hold.

## **3.2 Methodology**

For conducting this research, I have interviewed a handful notable of candidates such as Mr. Mustain Billah (CEO of IOL), Nazrul Islam (Plant Manager at IOL), Md. Rashed Mosharaf (Senior Manager of Accounting and Finance at IOL), and a few more employees at the company I finished my internship under. Additionally, I had interviewed Shahidul Islam (Director of M/S Islam & Brothers), the proprietor of a steel trading company, in addition to some marketers that sell to M/S Islam & Brothers from different steel manufacturers. I had crosschecked all the information I had derived with one another and rejected any contradicting accounts for accuracy. The interviews, while very informative, were mainly qualitative in nature as a more quantitative approach was not viable because of company policy and the difficult nature of getting hold of said people.

I had carried out some quantitative research as well, in the form on analyzing sales data at IOL and carrying out a Google forms survey to people who had purchased medical oxygen in the recent months. The sample size of my survey was 15 people, and I had collected many types of end user related data through that survey. Although I was restricted from taking or disclosing any said sales data outside of the office, I was allowed to analyze trends and percentage figures in sales. I am permitted to use non-exact figures for the purposes of this paper.

Taking all the collected data into consideration, I have deduced the possible direction the oxygen market could head in the case of a further spike in demand or if a third wave of COVID-19 outbreak occurs in Bangladesh. This deduction is based on the current situation in India that has risen due to the second wave of COVID-19 effecting the country at the time of writing this report.

## **3.3 Findings and Analysis**

### **3.3.1 Conditions in Bangladesh**

The manufactured oxygen market in Bangladesh is dominated by a handful of companies, such as Linde BD, Spectra Gases, Islam Oxygen Limited, Associate Oxygen limited and a few others. Numerous small producers also exist, but they primarily supply steel plants and are

owned by the same people. Industrial oxygen makes up roughly half the sales of IOL as per sales records for the period I had worked there as an intern. Under normal circumstances, that is mostly the case for most companies of the nature, except for Linde BD, who has more medical sales on average, according to Mustain Billah, CEO of IOL.

Medical oxygen is mostly used to treat patients for various ailments, recently added to that list, being COVID-19. This has boosted the demand for medical oxygen as it is necessary for some patients suffering from said virus. There is also a market for pharmaceuticals that require medical oxygen. The majority of industrial oxygen is used for cutting steel from ships, to make the plates from them transportable via trucks to steel factories. These pieces are cut again by using oxygen in the factories to make portable pieces, ready to be cut and shaped into rebar, steel angles, etc. In addition, any cutting of steel, and some aspects of metal working also require oxygen.

### 3.3.2 Conditions in India

During the first wave of the COVID-19 pandemic, the oxygen supply in India was relatively unaffected due to them having excess production capacity for exports and industrial supply. IOL was purchasing oxygen up until one week before the second wave of COVID-19 struck India. They had seen what happened in the first wave, but did not do much about it instead of rely on stopping exports to fill up the increased local demand (Usher A. D. 2021). It had become so bad that imports had to be made from other countries, although it was a very slow process.

Although production was not insufficient all over the country initially, the poor logistics and difficulty of transporting oxygen was enough to cause an accelerated disaster in certain regions (Bikkina, S. 2021). Medical oxygen requires cylinders or tanks with a special coating on the inside to make it safe for human consumption. Such tanks, transporters, and cylinders are not available in such huge quantities on demand. Later in my findings, we will see this is very much true for Bangladesh as well.

Oxygen production cannot be increased over maximum capacity overnight (Kandavel S. V. S. 2021). Therefore, in addition to supplements from foreign sources, the Indian government had

taken some steps to speed up the process of getting more medical oxygen to COVID-19 patients. They had banned the sale of liquid oxygen to industries (Sharma, N., & Achom, D. 2021) to free up that production capacity to try and meet the inflated demands. Indian government, in addition, has also made it a priority for officials to process any documents related to medical oxygen and generally decreased red tape for them (Suraksha, P. 2021). In addition, steel producers had also stepped in to boot the oxygen supply by producing and supporting producers of medical oxygen (Singh, A. 2021). Despite all the efforts, a lot of COVID-19 patients passed away due to a lack of oxygen. This is due to a lack of forethought on the matter. Hence it gives rise to the question: should steps be taken to prevent such a disaster in the case of Bangladesh, where the situation has not yet deteriorated to such an extent. There is still a risk to both countries if a new variant of the virus is to emerge in the future or a new hike in demand was to occur.

### 3.3.3 Producer's Point of View

From interviewing various people involved in the manufacture of oxygen in IOL, I have made a number of interesting findings. Firstly, for most producers in Bangladesh, the sale of oxygen is roughly uniformly divided between medical and industrial sales. This data also coincides with the sales figures in IOL during the time I had been working there as an intern. What this means is that industrial demand makes up for a large portion of the demand for bottled oxygen. As of April 2021, supply to industries were almost completely cut off to make up for the increased demand in hospitals. This, along with the lack of imports from India, had tested our capacity to supply to hospitals to the maximum. This heavily implies that if the pandemic situation worsens, producers in Bangladesh may not be able to meet the demands. Cutting industrial supply has given a rise to all steel prices in the country by at least one to two thousand taka per ton according to the proprietor of M/S Islam & Brothers, over few months. This rise in price had affected other sectors of the industry as well, much like a ripple effect throughout the entire economy.

Oxygen can be manufactured as either a gas or liquid. There are only two companies that have liquid oxygen production capabilities, Linde BD and Spectra Gases. Liquid oxygen is more efficient to produce and much easier to transport and store. It is possible to install a tank at a hospital and use tankers to transport the liquid oxygen directly to it from the factory. This

circumvents the necessity of individual cylinders for the delivery of oxygen. One of the bottlenecks that medical oxygen manufacturers face is the shortage of medical grade cylinders for delivery. None are manufactured within Bangladesh and all cylinders are imported mostly from China and India. Medical cylinders are the same as the industrial variants in all aspects but a special coating that is applied on the inside walls. This makes it medically safe. Also, individual cylinders are heavy and expensive, hence it is much more practical to supply hospitals in larger tanks.

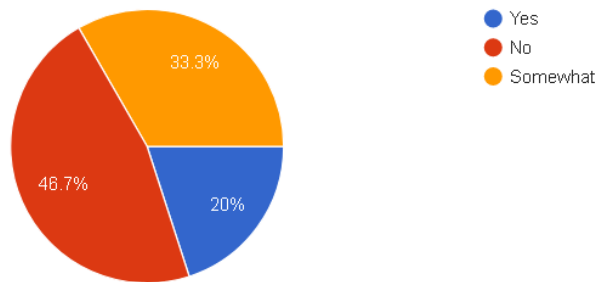
Liquid oxygen plants are expensive to establish. Companies like IOL receive no tax break or any other privileges of the kind to expand their operations. Not only that, but Bangladesh government refuses to give such companies natural gas lines which may ensure smoother and non-stop production. Frequent power outages plague IOL and decrease their production capacity by a substantial percentage on average. It takes a while for the pumps of the machines to reach peak production, therefore every power outage reduces efficiency for a while even after the electricity is back. No priority has been given to such companies except for some exceptions to the lockdown laws, which are also applicable to other less immediately necessary companies, like garments and steel.

#### 3.3.4 Customer's Point of View

End users of medical oxygen are usually people with lung damage or undergoing some sort of surgery. There are many causes of lung damage, but in recent times, a big portion of said damage is a direct result of the COVID-19 virus. People who had purchased oxygen cylinders for home usage in the survey report it to be expensive, whereas people purchasing from hospitals claim otherwise.

Do you feel like medical oxygen is too expensive?

15 responses



*Table 1 Opinions on pricing of medical oxygen*

The people who had purchased medical oxygen outside of a hospital mostly seem to claim it is too expensive. What this ultimately means is that people are including the price of the cylinder, flow meter, trolley and pipes along with the price of the gas. For a bottle of size 1.36 m<sup>3</sup>, the all-inclusive price in the market is around Tk. 15000 to Tk. 17000, whereas the refill cost is only a Tk. 100. Hospitals do not require you to pay for the cylinder, therefore the customer does not have to bear all the expenses. Initially, there were reports price fixing by some ill-informed or questionable reporters. But in reality, the price has not changed since 2016, after a rise in electricity costs. It is the shortage of cylinders that made retailers charge more for the full package of cylinder, meters and gas.

As for shortage, only a minority faced shortages or difficulty availing oxygen (only about 13.3%) again, due to the shortage of cylinders. However, a vast majority of the surveyed had concerns regarding possible future shortages and some agreed to the possibility of stocking up on bottled oxygen. This could lead to further shortages.

Are you concerned about possible shortages?

15 responses

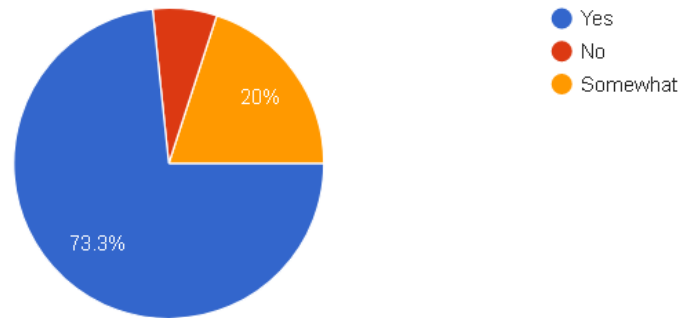


Table 2 Concerns about possible shortages

Another consensus that has an overwhelming one sided was the view of government intervention. People believe that the government should in some way aid the medical oxygen producers. This is a point that the producers also agree with the consumers. As we know, the government intervention and efforts in India was too little too late for many who were in need of medical oxygen. It was a sad event that no one would like repeated. It can be agreed that government should take a closer look at this situation and preemptively take steps to prevent any disasters of that sort.

Do you think the government should subsidize or incentivize the oxygen industry?

15 responses

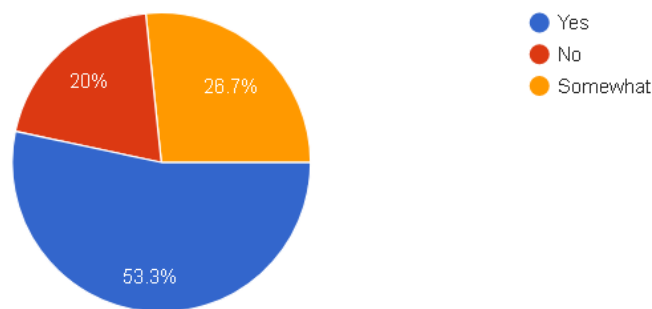


Table 3 Opinions on government intervention

### 3.4 Summary and Conclusions

The medical oxygen production and supply is adequate for the current situation in Bangladesh. However, the production is made adequate by denying industrial oxygen. This means that the



actual production capacity is close to maximum. A further rise in demand in the future might strain the production and eventually lead to a shortage such as seen in India if the capacity is not expanded. I believe there needs to be more redundancy or spare production capacity, even if only temporarily until the pandemic ends.

There also needs to be more cylinders imported into the country as that may cause a bigger bottleneck in supply when production capacities are expanded. Also, the people need to be more aware about medical oxygen so that they do not hoard in the time of emergency and also possibly encourage contribution by steel plant owners who also produce oxygen.

The most important factor of all this is government intervention before disaster occurs. There needs to be proper power supply to these companies, tax breaks or subsidies (temporary), for expanding capacities. It is the government's responsibility to work towards the welfare of the public, more so than the privately owned businesses, which are more focused on paying their bills and interests. By comparing situation in Bangladesh to that of India, it is concerning how little the government did to a vital sector of saving COVID-19 patients. Yes, more temporary hospitals can be erected, vaccines acquired, but nothing so far had been done to prevent any possible oxygen shortages. We are at risk of the new deadlier strain of the virus coming into the country and not guarantee of supplemental oxygen from India, as we used to receive before the second wave of the virus broke out over in India.

### **3.5 Recommendations**

I would recommend that the government of Bangladesh give especial privileges to oxygen producers until the pandemic subsides, for example subsidizing interest payments and reduction of red tape, especially when importing equipment such as machines and cylinders. On the most basic of levels, they at least need to grant permission for natural gas lines to the manufacturers in order to ensure the smooth operation of existing plants and raise their efficiency.

Further steps such as incentives could also be offered if government surveys justify them. More awareness should be raised on the usage or misuse of medical oxygen to prevent further unnecessary usage of them. Further recommendations would include planning with other countries about possible need for importing oxygen in the case of an emergency, so that the actions can be executed swiftly if the need arises.

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