

Department of Civil Engineering

Air pollution Report

By:

Yazan madallah al-balawi
391110402
&
Abdullah sadd
391100693

Dr. Talal Obaid AL-shammari.

TABLE OF CONTENTS

Introduction.....4

Air pollution in Dubai.....8

Air pollution in Riyadh.....14

Conclusion.....19

References.....20

LIST OF FIGURES

Fig 1.1: shows all types of natural or industrails emissionds…….……4
Fig 1.2: shows all main causes of air pollutions……..……5
Fig 1.3: Shows what air pollution can cause to human's health……...…..8
Fig 2.1: shows some of climate and city emissions of air pollutions in dubai……....10
Fig 2.2: shows some of air quality index data about dubai……...……11
Fig 2.3: shows some of car and industrail emissions of air pollutions …….13
Fig 2.4 imaginry photo to what dubai intentions would be in the future for better air quality…….15
Figure 3.1 : Shows some city emissions of air pollutions in Riydh……...……16
Fig 3.2: Shows the air quality index data about Riyadh……17
Figure 3.3 : Shows some trees that was used…….18
Figure 3.4: imaginry photo to what Riyadh would look like in the future for better air quality…….……21
Figure 3.5 : Shows The King Abdulaziz Project for Riyadh Public Transport progress……..22
Figure 3.6: Shows the website interface. (https://aq.riyadhenv.gov.sa/).....22

Chapter One

INTRODUCTION

Any substance that alters the natural properties of the atmosphere, whether it be chemical, physical, or biological, is considered an air pollutant. Air pollution can occur indoors or outdoors.

Common causes of air pollution include motor vehicles, industrial operations, household combustion appliances, and forest fires. Particulate matter, carbon monoxide, ozone, nitrogen dioxide, and sulfur dioxide are pollutants of great public health concern. Both indoor and outdoor air pollution are significant contributors to morbidity and death and are known to induce respiratory and other illnesses.

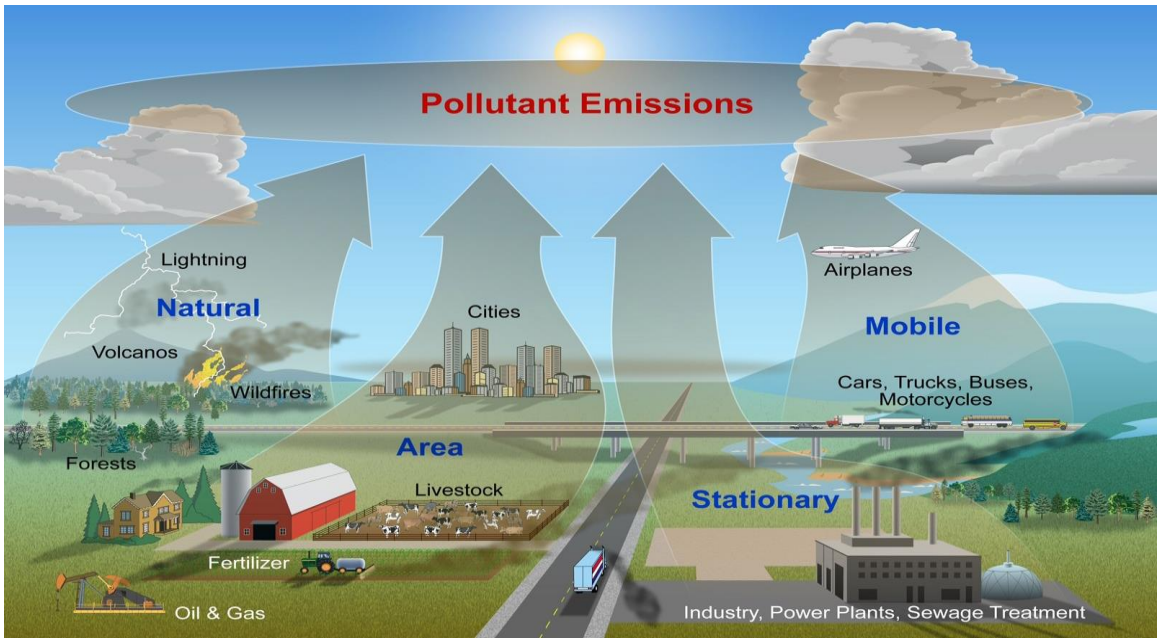


Fig 1.1: shows all types of natural or industrails emissionds.

It has become nearly hard to breathe clean, fresh air due to the increased number of air pollutants. Everyone is worried about their health as a result of the causes of air pollution. Over 7 million people each year are killed by air pollution, which is the leading cause of environmental death.

There are about 10 main air pollution causes which are they;

1. The Burning of Fossil Fuels.	2. Industrial Emission.
3. Indoor Air Pollution.	4. Wildfires.
5. Microbial Decaying Process.	6. Transportation.
7. Open Burning of Garbage Waste.	8. Construction and Demolition.
9. Agricultural Activities.	10. Use of chemical and synthetic products.

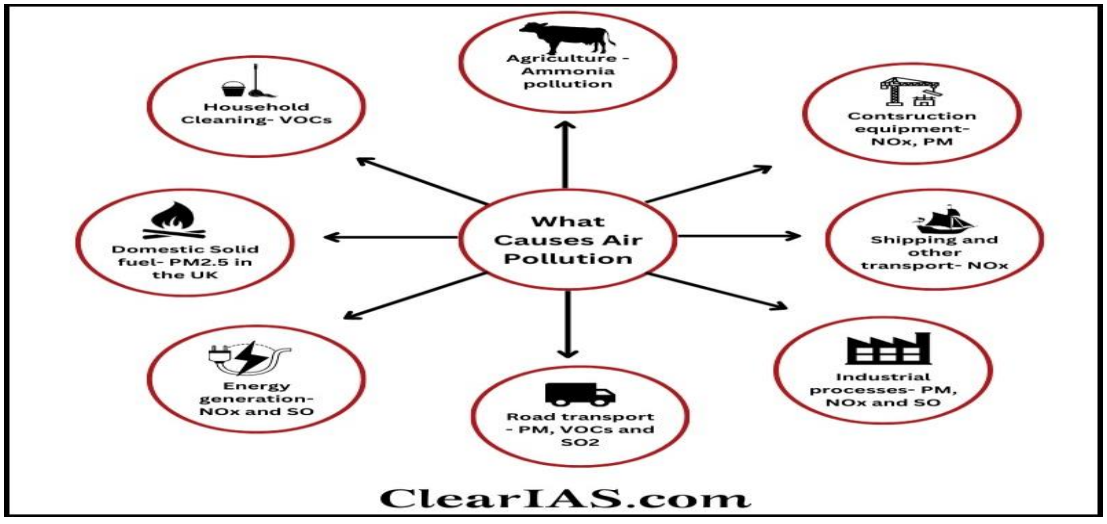


Fig 1.2: shows all main causes of air pollutions.

Effects on People

Exposure to air pollution has a wide range of negative health impacts on people. Short-term effects and long-term effects are two categories of effects.

Temporary consequences that are brief include conditions like pneumonia or bronchitis. They also include discomfort like rashes on the skin, eyes, nose, or throat. Headaches, lightheadedness, and nausea are among symptoms of air pollution. Air pollution also includes offensive odors produced by factories, landfills, or sewage systems. Although less harmful, these scents are nonetheless unpleasant.

Air pollution's **long-term impacts** can persist for a number of years or a person's entire lifetime. They might even result in someone's demise. Heart disease, lung cancer, and respiratory conditions like emphysema are some of the long-term health repercussions of air pollution. Additionally, long-term exposure to air pollution can harm a person's nerves, brain, kidneys, liver, and other organs.

Limit the harm that air pollution causes

At the rate that air pollution is rising throughout the nation, immediate action is now absolutely necessary. It not only has an impact on our life but also devastates the environment.

According to famous Nelson Mandela sentence "Everyone has the right to an environment that is not harmful to their health or well-being; and to have that environment protected, for the benefit of present and future generations."

When applying and doing the below we can save us as much as possible from the harmful effects caused by air pollution:

1. The first step to a better future with pure air to breathe is energy conservation.
2. It's important to comprehend the idea of reducing, reusing, and recycling and to develop good habits in this regard.
3- To save on gas and cut down on automobile pollution, take the public transportation whenever possible.

What effects does air pollution have on people's health :

High amounts of air pollution can have a number of negative health effects. Lung cancer, heart disease, and respiratory infections are all at increased risk because of it. Air pollution exposure, both short-term and long-term, has been linked to negative health effects. People who are already ill are subject to more severe effects. The elderly, children, and those in poverty are more vulnerable. The most dangerous contaminants for your health are directly linked to a high rate of early death.

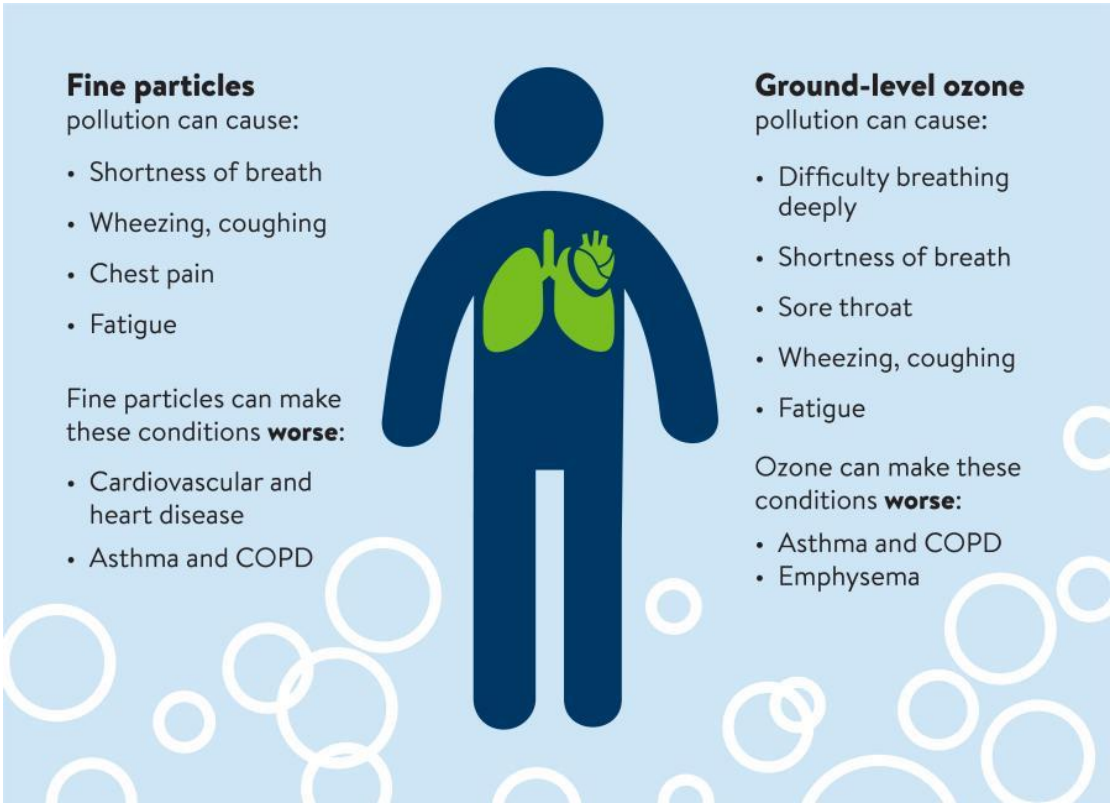


Fig 1.3: Shows what air pollution can cause to human's health.

What steps may persons take to safeguard themselves?

Everyone has a duty to fight air pollution. We all need to work much harder. with haste and initiative to lessen air pollution. It is essential to make concerted and coordinated efforts with the active participation of all sectors. Government (federal, state, and municipal), cities, the general public, and people are all included in this.

To national governments: lower emissions and establish national requirements that satisfy WHO air quality standards. Invest in clean air and pollution research and education—these are crucial resources.

Cities and local communities: All public initiatives must take into account public health from the outset and be supported by adequate data and evaluation methods.

Regarding people: Continue to speak out for your right to a sustainable and healthy environment. Require your governments to account.

We are all responsible, whether we are in the government, the commercial world, or as individuals. Consider and reconsider how you live, what you consume, and how you might make sustainable decisions for yourself, your kids, and their kids.

Chapter 2

Air pollution in Dubai

Dubai is located on the United Arab Emirates' shoreline on the Persian Gulf. Dubai has common boundaries with the Sultanate of Oman in the southeast, Sharjah in the northeast, and Abu Dhabi in the south.

Dubai has experienced remarkable expansion in its population, economy, and infrastructure, making it one of the cities with the greatest population growth rates in the world. Although the city has experienced expansion and development, it has also struggled to preserve a healthy and sustainable environment, notably with relation to air quality.



Fig 2.1: shows some of climate and city emissions of air pollutions in dubai.

The Air Quality Index (AQI) is used for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health effects you may experience within a few hours or days after breathing polluted air.

And here in the below photo it shows how Dubai is polluted according to the US AQI that air quality index reported.

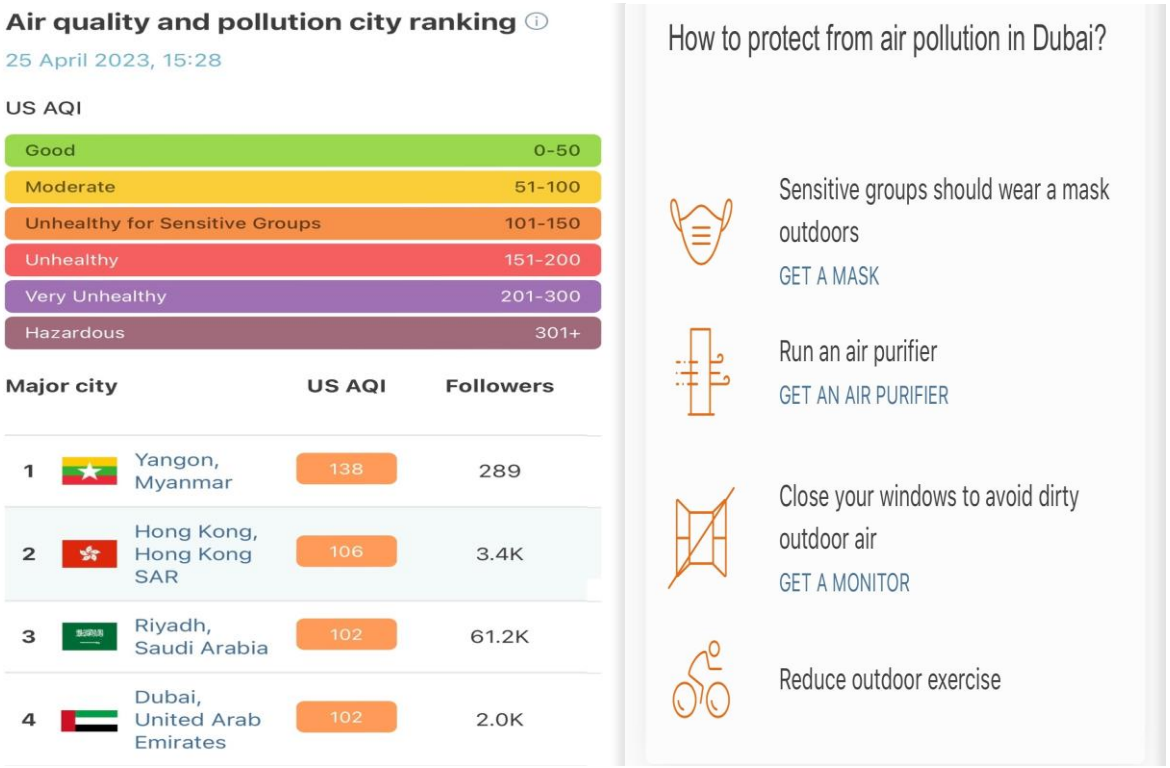


Fig 2.2: shows some of air quality index data about dubai.

Due to its high levels of pollution, particularly in the summer, the air quality in Dubai is a cause for concern. The primary causes of air pollution in Dubai include motor vehicle emissions, industrial processes, building sites, and dust storms. High pollution levels can have a negative impact on the health of locals and visitors, leading to respiratory disorders, heart disease, and other health concerns.

To improve the city's air quality, the Dubai government has implemented a number of initiatives. One of the projects involves putting strict controls in place for emissions from industrial sits , automobiles, and construction sites.

To cut down on dust emissions from construction sites, the Dubai Municipality has imposed severe controls on the construction sector. In order to lower emissions from the transportation sector, the Dubai Road and Transport Authority (RTA) has also been striving to adopt stricter restrictions for automobiles. The RTA has been pushing the use of electric and hybrid cars and trucks and also offers incentives for doing so.





Fig 2.3: shows some of car and industrail emissions of air pollutions .

The creation of parks and green spaces in the city is another project of the Dubai administration. By growing more trees and building parks and green spaces, Dubai has been making efforts to increase the amount of greenery in the city. By absorbing carbon dioxide and other pollutants, the plan aims to increase the city's green space, lower its carbon footprint, and improve air quality.

In order to lessen its carbon footprint and enhance air quality, Dubai's government has been supporting green building techniques. The city is also well-known for its famous buildings. The Green Building Code was established by the Dubai Municipality and mandates that all new construction adhere to green building principles, including the use of renewable energy sources, energy-efficient lighting and air conditioning systems, and sustainable building materials.

One of the best advances towards cleaner air and a healthier quality of life is embarking on major public parks revamp as part of 2040 vision. The project aims to make the parks more engaging to visitors as creative, social and natural spaces and falls within the framework of the recently-announced Dubai 2040 Urban Master Plan.

- The project, which is part of the recently unveiled Dubai 2040 Urban Master Plan, intends to increase the parks' appeal to tourists as artistic, social, and natural places.

- The master plan, which was unveiled by Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the United Arab Emirates and Ruler of Dubai, lays out a thorough future map for sustainable urban growth with the goal of making Dubai the best city in the world to live in.

- The collaborative park redesign project seeks to advance sustainable land use and advance the enjoyment and well-being of the community, both of which are important objectives of the 2040 Master Plan.



Fig 2.4 imaginry photo to what dubai intentions would be in the future for better air quality.

Chapter 3

Air pollution in Riyadh

Riyadh It is located on the eastern side of the Najd plateau in the middle of the an-Nafud desert and is the biggest city on the Arabian Peninsula. Around 5 million visitors visit Riyadh every year, ranking it sixth in the Middle East and 49th worldwide. In 2019, Riyadh had a population of 7.6 million, making it the most populated city in Saudi Arabia, the third most populous in the Middle East, and the 38th most populous in Asia.

Riyadh which is the largest city in Saudi Arabia is also its most polluted, with 15 times what a healthy average annual PM 2.5 should be. The city attributes the high pollution days in part to sulphur dioxide in the air, which predominantly comes from industrial activity.



Figure 3.1 : Shows some city emissions of air pollutions in Riydh.

In terms of the Air Quality Index (AQI), the air quality was very bad by the end of 2020. The air quality was rated as "Unhealthy for Sensitive groups" with a US AQI of 102. With a concentration of 37.6 g/m3, or nearly 4 times the amount advised by the World Health Organization (WHO), PM2.5 was the leading pollutant. When the air quality is this severe, it is advised to wear a high-quality mask, cover doors and windows to keep the dirty air out, limit outside activity, and use an air cleaner if one is available.

Below is attached a picture showing air pollution in the city of Riyadh, according to the US AQI website.

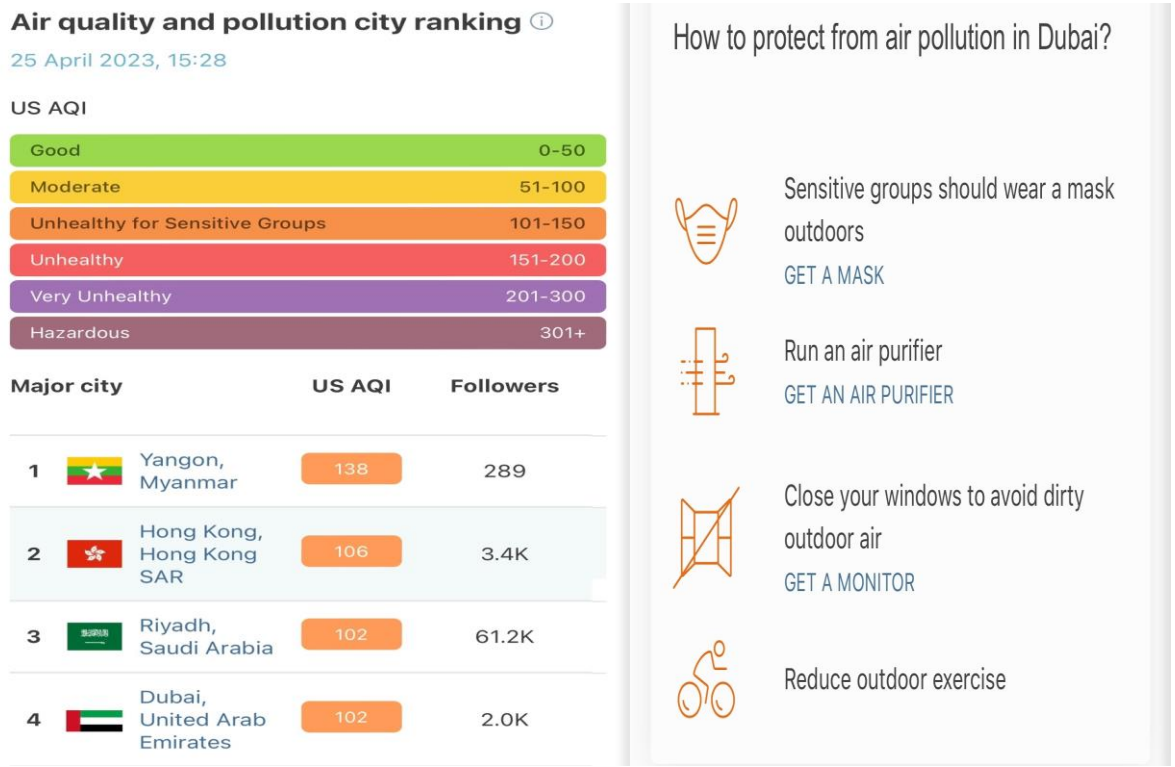


Fig 3.2: Shows the air quality index data about Riyadh.

As the air quality in Riyadh whether it's getting better or worse now. Ground, water, and air pollution from urbanization are major problems. More desalinated water is required for cities. Desalination facilities emit greenhouse gases and are incredibly ineffective. High levels of carbon dioxide are released during oil extraction, which also adds to air pollution. Overproduction of greenhouse gases lowers ozone layers and contributes to a rise in global temperatures.

Deforestation is a result of rising agricultural needs as well as rising energy usage. Wood is frequently treated as a throwaway material and is thus carelessly used. As the desire for additional agricultural land rises, deforestation happens both legally and criminally. Because mass the monocultures rarely make use of the natural resources, there is frequently a severe water shortage. Desertification may result in the end result of this.



Figure 3.3 : Shows some trees that was used.

The Royal Commission for Riyadh City launched the Air Quality Management Program with the goal of purifying the city's air by monitoring the quality of air in urban neighborhoods, on roads, and outside the urban area in an effort to lessen the effects of pollutants sources, which can cause harm. This program is based on the risks associated with air pollutants and the good measures that should be channeled toward appropriate decision-making on the reduction of these pollutants' harmful effects.

There are 32 air monitoring stations constructed by the Royal Commission of Riyadh City to measure the concentration of 10 specific pollutants such as sulfur dioxide, carbon monoxide, volatile organic compounds and lead. These stations will help and enable the city to take initiatives to reduce air pollution, including:

Developing disaggregated and accurate air pollution indicators, supporting scientific research and research on air quality, creating websites and applications to receive real-time air quality updates and indicators. These air quality monitoring stations have collected over 40 million validated measurements since they began operating in 2016. The minimum accuracy is 96.8%, while the international standard for acceptance of data quality is 75% or better.

The Royal Commission for Riyadh City has made actions to help improve the city's air quality, such as:

- The beginning of the Green Riyadh initiative, which aims to enhance air quality by reducing sand particles, growing trees to clean the air, and absorbing hazardous air pollutants.

- The King Abdulaziz Project for Riyadh Public Transport, which aims to decrease the percentage of vehicles polluting the environment by reducing automobile use to about 47%.

- Launching the website and the app to display, in real-time, air quality indicators in the user's immediate vicinity; they also offer data that can help studies and research in the field of science on the condition of the air.

The Green Riyadh project

By planting 7.5 million trees around all city features and services, as well as throughout all of its provinces, the Green Riyadh initiative will increase the per capita share of green space and raise the total amount of green areas. The irrigation network's recycled water will be used to irrigate all of the greenery. The city's air quality will be enhanced, and temperatures will drop as a result of the greening program. As a result, this initiative will motivate Riyadh residents to adopt a healthy lifestyle, which is a component of the Kingdom's Vision 2030.



Figure 3.4: imaginry photo to what Riyadh would look like in the future for better air quality

The King Abdulaziz Project progress is shown in the picture :

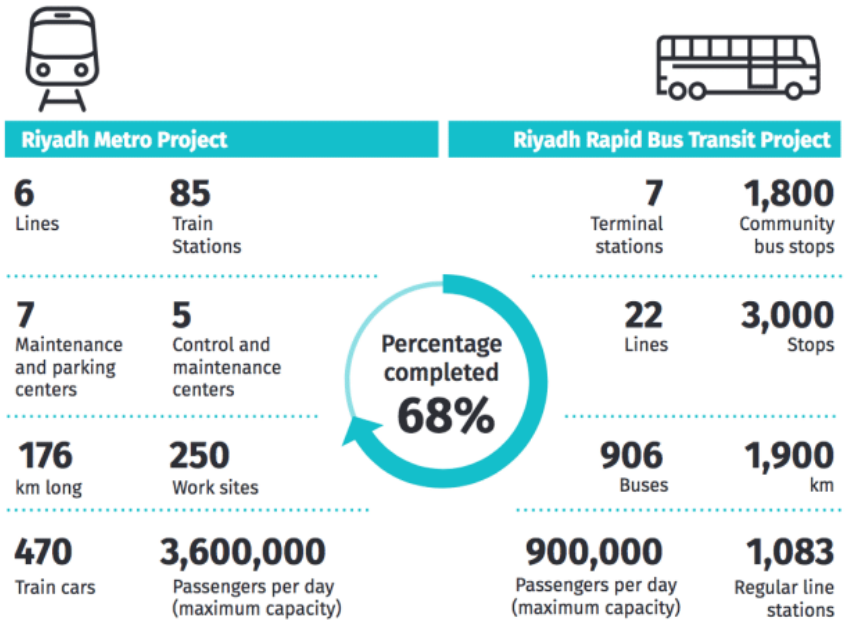


Figure 3.5 : Shows The King Abdulaziz Project for Riyadh Public Transport progress.

Finally, the website interface is shown below to track the air quality directly in the city of Riyadh, knowing that there is also an application for smart phones.

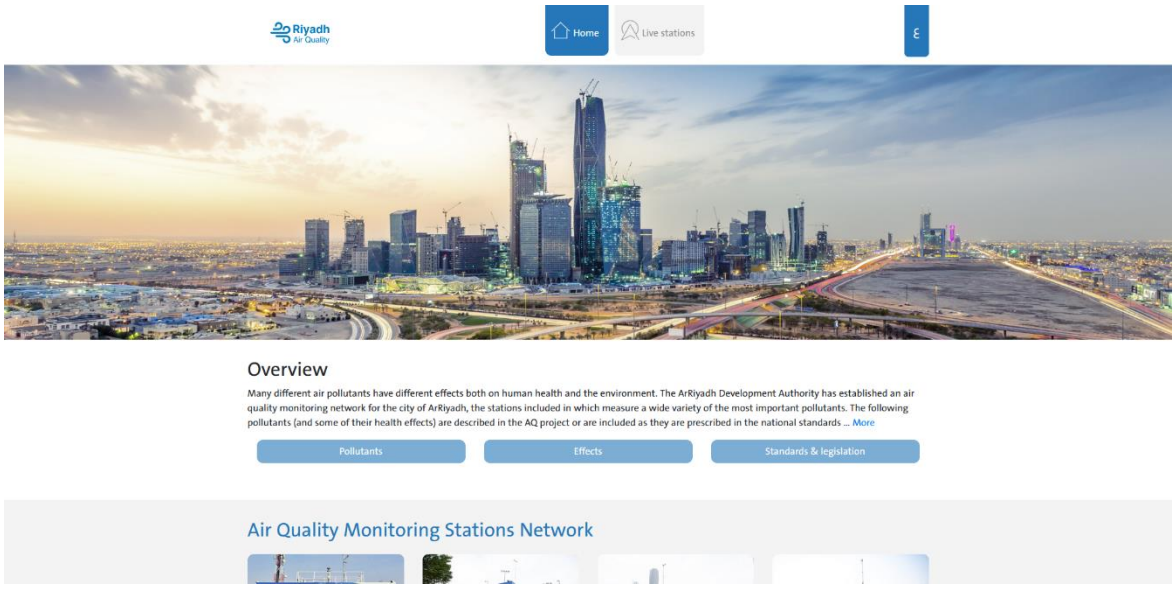


Figure 3.6: Shows the website interface. (https://aq.riyadhenv.gov.sa/)

Conclusion

We talked about an easy and simple introduction on air pollutions and it's effects in so many harmful ways, air pollution may cause harmful effects on human's health and human activities and may lead to Numerous illnesses, including stroke, chronic obstructive pulmonary disease, trachea, bronchus, and lung cancer, aggravated asthma, and lower respiratory infections, can develop as a result of both short-term and long-term exposure to air pollution.

We also did a comparison section between two cities which are Saudi Arabia (riydh) and united arab emirates (dubai)

And we discussed all the sources of air pollution and where it comes from and what procedures the government did to save its citizens and protect their environment.

References

- https://www.iqair.com/world-air-quality
- https://www.eea.europa.eu/en/topics/in-depth/air-pollution/eow-it-affects-our-health
- https://www.pca.state.mn.us/air-water-land-climate/air-quality-and-health
- https://www.envirotech-online.com/news/air-monitoring/6/international-environmental-technology/understanding-air-quality-in-dubai/59679
- https://www.riyadhenv.gov.sa/en/news/air-quality/
- https://www.rcrc.gov.sa/en/projects/green-riyadh-project