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A Case Study of Air Quality in Kabul, Afghanistan

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ABSTRACT: The air quality in Afghanistan is severely affected by various pollutant sources, the impacts of which often cause acute health problems, particularly among the old, young and those suffering from poor health. The impacts of chronic exposure to air pollutants are also likely to become apparent over time. The purpose of this air quality dissertation is to assist policy makers in the design and implementation of policies, and in the development of monitoring and management tools to restore air quality in Afghanistan. Since 2001, Kabul city's population has grown from four hundred thousand to six million people. Estimates of various pollutant emissions indicate that vehicular traffic, windblown dust, brick kilns, residential heating during winter season, and domestic and commercial generators are the major sources of air pollution in Kabul. The estimated total annual emissions in Kabul are 17,363 tons of PM_{10}, 16,183 tons of NOx, 2,484 tons of SO_2, 97,068 tons of CO_2, and 650,846 tons of CO_2 .In the article "*In Kabul, air pollution a bigger killer than war*" that every year around 3,000 people die in Kabul city due to air pollution whereas the total mortality rate due to war across the country is 2,777 cases.

KEY WORDS: Air, Quality, Kabul

INTRODUCTION

The area of Afghanistan is 652,000 square kilometers and it is a landlocked country, of which one-third is mountains. The Hindu Kush mountain area separates Afghanistan into south and north. The country's capital, Kabul, is also mountainous. Afghanistan has 34 districts. The city of Kabul is the national administrative, commercial, educational, industrial and communications center. At its initial stages, Air Quality Monitoring (AQ) is in the country. In line with an ADB-funded initiative a Kabul Air Pollution Monitoring Network will be set up. The Kabul network will consist of nine sampling stations to monitor levels of particulates not more than 10 microns in diameter (PM10), sulfur dioxide (SO2). The following selected sites will set up the nine stations. The survey collected the perception of the general public regarding the air quality of Kabul. Around 89% of the respondents stated that the air quality is unacceptable and poor. And the rest of the 11% thought that the air quality was acceptable and decent (Country Synthesis Report on Urban Air Quality Management Dec 2006).

One of the most severe problems in the world is air pollution. It relates to damaging substances that contaminate atmospheric chemicals or biologics. According to the Blacksmith Institute in 2008, two of the most polluted locations worldwide are urban air quality and indoor air pollution. The issues must be understood and methods of combating air pollution must be identified. High air pollution levels are presently reported in many towns in distinct nations in Afghanistan, although much air pollution has been observed in comparison to other nations, this is a potential issue. A significant issue that is hard to address, but even when the large majority of vehicles are h, for many reasons, air pollution and government transport gas are increasing every day. The scenario becomes dangerous when faults that increase the quantity of gases are well increased by quantities of the contaminants that match ordinary operation and strong particles are thrown outside. Vehicles are said to be markedly worn out or not toned correctly in engine components, to smoke out of their exhaustion, and to produce pollution that hundreds of times as much as normal since in Maturin, most publicly-built cars are poorly conditioned, so pollution can be presumed to be greater than it should. Human health is impacted by air pollution primarily because of the increasing air condition and the effects on the presence of carbon monoxide molecules moving oxygen to the blood irrigation induced by brain structures. Moreover, polluted air can have an effect not only on health but on the financial condition, such as agriculture and other manufacturing industries, which can adversely affected the country's economy and trigger a country's poverty rise. Poor nations like Afghanistan have poorer technologies that are hard to mitigate, with air pollution and climate change in order to improve sanitation, and to decrease poverty. Air quality in Kabul needs to be determined first for suggesting ways of increasing the quality.

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This study is conducted to look out on air quality situation in Afghanistan. The main objectives of this study are:

1- To determine and analyze the air quality in Kabul Afghanistan.
2- To manage the air quality of Kabul Afghanistan.
3- To improve quality of air and policy in Afghanistan.

Study Scope

Quality of air is one of the major factors of the environment that can affect both wild and human lives along with affecting the agriculture and economy of the country. So, the study emphasizes on the impacts, situation and policies of air quality.

Limitation of Study

There are many challenges faced by the researcher in least developing countries such as Afghanistan. The main constraints of this study are lack of data, limited environmental studies and lack of information and resources. We have therefore tried to use International Non-Government Organizations' (NGOs) data and information.

MATERIALS AND METHODOLOGY

Study Area and Sample

The town of Kabul is pressed down and poorly populated. Over latest years, the city's ambient air quality has worsened so much that it is one of the dirtiest urban areas of the world. In most days there is less than one hundred meters of once unlimited view in the 1980s. It is very uncommon to see the Qurugh Mountains, the Paghman Mountains and the Plain of Shomali which once formed part of the snowy countryside of the city. A breath of fresh air cannot be bought at any price for city residences, on most days of the year. It appears that it has fired to look out from an advantage point at the town landscape. Burned pneumatically, plastically, motor oil and other carcinogenic substances generate various airborne cancers.

Particulate Emissions from Road Traffic

As replied by the Kabul Traffic Administration and the National Environmental Protection Agency of Afghanistan (NEPA), Kabul has over 300,000 passenger vehicles and 100,000 trucks in operation in Kabul. The United States Environmental protection Agency (US EPA) and the United States Department of Transportation (USDOT) calculation methods were used to calculate emissions of particulate matter from traffic on public roads in Kabul. Furthermore, it was assumed that the air polluted would be 250,500 m (4082 km^2), while the concentrations of PM2.5 and PM10, respectively, were calculated at separate atmospheric levels (Table 1). For simplicity, the pollutants are spread in the atmosphere as they are deemed uniform within the air strata.

Table 1: Particulate Emissions Attributed to Moving Traffic in Kabul Polluted

Polluted Atmosphere Thickness, m	Air Pollutants Concentrations µg/m3	
	PM 2.5	PM10
500	39,46	396.32
250	78.92	792.67

This is because the polluted air distribution in the vertical air distribution in Kabul is unknown, and air pollution is even present in high mountains around the city. The average annual level of PM2.5 in Table 6 is 39.46 µg / m3, 2 and half times higher than the 15 µg / m3 annual standard of the EPA.

Table 2: Total annual emissions of Particulate Matter Triggered by Moving Traffic

Particulate Emissions Attributed to Moving Traffic in Kabul			
PM2.5 Emissions		PM10 Emissions	
t/y	t/day	t/y	t/day
24564.41	80.53	246724.5	808.92

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Pollution from the Tail Pipes of Passenger Vehicles and Trucks

300,000 vehicles and over 100,000 Lorries generate serious grid blocks and jams in Kabul's tight roads. The traffic jams are so bad that people often cannot cross the highways or simply walk along badly kept sidewalks, which are overtaken by irritating drivers. For many citizens motorcycles once the most common mode of transport are now at great danger, because a car is overridden. In most vegetable vehicles, the quality of fuel is bad, air files are connected to a high level through the rapid accumulated air particulates and the oxygen pressure in Kabul decrease owing to high urban levels (1800 m). The result is unturned engines, excessive oil burns and unfinished fuel consumables consumption due to poor quality of fuel. The EPA Factor calculated from the United States was used to calculate emissions in all Kabul vehicles and trucks and is displayed in Table 8. As can be seen from a table: coal monolith, nitrogen oxides, unburying oil and other hydrocarbons, significant quantities of feathers disperse into the Kabul atmosphere from vehicle sources.

Table 3. Air Emissions from Vehicles Tail Pipe

Air pollutants	Emissions, t/y	Emissions, t/day
Hydro carbons (HC)	10257.14	28,10
Carbon Monoxide (CO)	77067.92	211,14
Nitrogen Oxides (NOx)	4942.01	13.54
Carbon Dioxide (CO2) Lead	769066.75	2107,03
Lead (Pb)	227.74	0,62
Fuel consumed	325348.81	1730,00

Emissions from Burning Tires

It is prevalent practice to mix shredded scrap tires in Kabul and the suburbs in the town. In brick stoves, public baths, lime stoves the pneumatics are labeled. Petrochemical products, black carbon, steel wires, heavy metals and chlorine in pneumatic compounds are used for natural and synthetic rubber piping. Metals such as plum and other tires are not decomposed in the environment, and concentrations in the ground are steadily increasing. In the event that a whole series of pipes is replaced each year with a new set, about 1,600,000 pipes are disposed of as waste and usually burned. (Sediqi, 2010).

Table 4: Emissions of air pollutants from burning tires

Air Pollutants	Emissions t/y	Emissions t/day
Total Organic Gases	7,35	0,02
Reactive Organic Gases	4,54	0,01
Oxides of Nitrogen	990,27	2,71
Oxides of Sulfur	109,19	0,30
Carbon Monoxide	714,38	1,96
Carbon Dioxide	33311,82	91,26
Total Particulate Matter	37,84	0,10
Particulate Matter (<10 Microns)	30,92	0,08
Acetaldehyde	0,01	$1.99x10^{-5}$
Benzene	0,01	$1.80x10^{-5}$
Formaldehyde	0,03	$7.66x10^{-5}$
Hydrogen Chloride	5,00	$1.37x10^{-2}$
Total Metals	0,03	$9.32x10^{-5}$
PAH	$5.68x10^{-4}$	$1.61x10^{-6}$
Hexavalent Chromium	$1.05x10^{-5}$	$2.88x10^{-8}$
Dioxin	$9.30x10^{-9}$	$2.55x10^{-11}$
Furans 59	$1.28x10^{-8}$	$3.50x10^{-11}$

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3.3.4 Burning Wood and Charcoal Emissions

Firewood and carbon are a significant cooking and heating energy source in Kabul. Around 2,500 tons of timber is imported into Kabul daily for cooking and heating purposes. However, in winter every day for four months around 1000 tons of coal are transported in the region. In this table on the basis of calculations, the total air pollutants from wood and charcoal combustion are included. Burning wood and coal can, as shown from a table, cause damaging levels of carcinogenic atmospheric pollutants like carbon monoxide, sulfur dioxide and nitrogen oxides such as benzene, PCBs, polyromantic flavorings (PAH) (Sediqi, 2010).

Table 5. Air Emissions from Burning Wood and Coal in Kabul

Fuel/ Pollutants	Air Emissions t/y	Air Emissions t/day
Particulates Total	21681.25	59.40068
PM10	8372,75	22.93904
PM2.5	6296	17.24932
Carbon Monoxide	67345	184.5068
Polycyclic Aromatic Hydrocarbons (PAHs)	69.7175	0.191007
Furans and dioxins	1.37225	0.00376
PCB's	*2.538x10 -9*	$6.95x10^{-12}$
Benzo(a) pyrene	$2.26x10^{-6}$	6.18E—9
Benzene	4636.66	12.70318
Sulfur dioxide	2977.6375	8.157911

Fired Electric Generation Diesel Emissions

Although Kabul's generation of diesel energy is being gradually reduced because of electricity imports from Central Asian republics, the generation of gasoline as diesel fuel in multiple parts of the town is estimated at 50,000 to 100,000 kW in electricity. Assuming that air pollutants emissions have been estimated and are indicated in table 4 (Sediqi, 2010).

Table 6: Emissions from a 200,000 Kw diesel power generators

Pollutants	Air Emissions t/y	Air Emissions t/day
PM2.5	105,07	0,29
PM10	105,07	0,29
SO_2	98,29	0,270
NO_X	1,494.65	4,095
VOC	118.62	0,325
CO	321.98	0,8825
CO_2	216,372.00	592,8

Burning bags, plastic cans and Styrofoam emissions

A few years ago, in Kabul and elsewhere in Afghanistan individuals used paper bags for shopping. Unfortunately, in latest years, plastic bags have been substituted that have caused serious environmental issues. Plastics for heating in government baths and government halls are prevalent practice in Kabul. It is estimated conservatively that every individual is using roughly 35 g of plastic backs, bottles and Styrofoam per week in Kabul. In the city of Kabul, plastic is used and then incinerated, supposedly using plastics for one million individuals. Total CO_2 emissions were estimated at 30 tons daily. Annual emissions from plastic burning are estimated at 10,950 tons. Other emissions, depending on the plastic composition and catalyst used to manufacture plastic compounds may also be dioxin, styrene, dioxide, and particulate matter (Sediqi, 2010).

Burning used engine oil emissions

There are approximately 400,000 engine vehicles in Kabul with multiple engine capabilities. The car oil change is on average 6 to 12 times per year depending on discussions with drivers, petrol change workshops and individual vehicle owners (around 1000

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kilometers) and changes are observed. Assuming that approximately 5 liters of oils are changed at a time, the heating process in Kabul is carried out conservatively by at least 20 million liters of oil waste. Motor toxic metals such as barium, plumage, chromium, nickel, cadmium and zinc are obviously mixed with motor oils and released into aero-foils from the air, which can pollute the atmosphere and impact human health as a function of the combustion of used motor oil. Estimated atmospheric emissions of poisonous metals are shown below in Kabul provided 30% of engine cars use diesel, or 70% petrol.

Table 7: Estimated Emissions of Toxic Metals as a result of oil incineration Oil

Oil Type /Pollutants	Emissions t/y	Emissions T/day
Barium	0,165	0,0004
Cadmium	0,249	0,00068
Chromium	0,489	0,001
Lead	11,386	0,031
Nickel	0,099	0,0003
Zinc	163,548	0,448
CO_2	52,724	144,447

As shown by the debates above, the impact on air pollution can be from minor irritations to illness and premature death based on the length of the exposure and the concentration of pollutants. The emissions inventory is an significant tool for diagnosing and planning and offers a cautious decision-making strategy. However, the emission inventory information in Kabul contain a broad variety of uncertainties and shortcomings. Although the calculation in this paper is not based on air monitoring data, it can still be the starting point for development of air pollution management policies. All calculations in this research are based on EPA and other advanced countries norms (Sediqi, 2010).

RESULTS AND DISCUSSIONS

Air Pollution in Kabul

An overall perspective of Kabul's town shows the blanket of air pollution. War in Afghanistan can kill thousands of civilians a year, but shocking air pollution from ancient wagons, bad fuel and waste burning in the capital Kabul, say specialists, is even more deadly. War can kill thousands of people a year in Afghanistan, but the shocking air pollution of the capital, Kabul, is deadly, according to specialists. On the chaotic roads of the town are the silent indications of the murderer, old-style contaminants, low quality fuel, and waste-fired individuals. The males and females use their masks and bourka, respectively, to maintain their dust away (Kazemi, 2011).

The town was designed for around a million people but now has about five million inhabitants, a figure that is reported to have doubled in six years from the municipality of Kabul. Many newcomers live in illegal slums and the infrastructure in Kabul has difficulties coping with. The roads of the city are normally interrupted by old and ill-maintained vehicles, which are illicitly imported from countries like Canada, Germany and the United States.

Many of the roads are paved so they raise the dust that contributes to poor air quality when the cars are able to move. The households often use diesel power generators, while companies such as brick plants and public baths use them. In the bitterly cold winters, people often burn whatever they can, including old pneumatic and plastic, while fighting to keep warm. The Ministry of Health estimates that the number of Afghans who have respiratory illnesses has increased to around 480,000 in six years. Officials acknowledge that, given the scale of Afghanistan's problems after three decades of war and almost ten years after the US Invasion in 2001, the Taliban are struggling to overcome the problem.

In addition to Fridays in the past year in an effort to reduce air pollution, they made Thursdays an official holiday in Kabul. A resolution was also passed to prohibit the import of old cars by businessmen.

The office of the mayor insists the move "had a very good effect," but could not provide any figures.

"We cannot allow (use) government vehicles on holidays, which prevents all vehicles from moving, and which helps to reduce pollution," said Mohammad Ishaq Samadi, spokesperson.

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The country has been at war for the past thirty years and there has been little environmental control, no protection of the environment at all.
Doctors warn that unless action is taken, Kabul faces serious problems(Kazemi, 2011).

Urbanization and Population

The Kabul, with an estimated population of approximately four million, is the most populous and urbanized area in Afghanistan. The population of the City increased from 1,78 million people in 1999 to around four million in 2016, which reached 15% annually in 2002, which was subsequently slower to 1,25%. The population density of Kabul is higher in the outskirts than in the city centre; Kabul is thus much less central than other Asian cities with similar density. (Torabi & Nogami, 2016)

The urban population of Afghanistan has a 20.3% share (2005) and is growing at 2.9% annually (ADB, 2006). Kabul, the country's capital, is also the most urbanized region in the nation. The individuals are estimated at 29,86 million as of July 2005, with a small population of 46 individuals per km2 (more than 35 million inhabitants) and according to the 2005 United Nations. Kabul is projected to have more than 6 million people in 2018. Other major towns in Afghanistan are Kandahar, Mazar-e Sharif, Herat, Jalalabad and Kunduz. Afghanistan is split into another 34 provinces. Kabul City is the country's administration, business, training, industry and communication center. Khwaja Rawash International Airport is just 5 km from the city center. Limited opportunities for employment in the outer provinces, individuals were compelled to relocate to Kabul and other significant metropolitan regions, and urban energy and mobility resources were put under pressure. Villages and housing were spread in a poorly planned town and extra sanitation, waste management and issues with air pollution were added. A significant portion of the town is also dominated by small-scale sectors, bakeries, mechanical automobiles and other infrastructure. A big amount of steel mills, bathrooms, industrial plants, stone crushing plants and heat stations are using diesel generators (“Ctry. Synth. Rep. Urban Air Qual. Manag.,” n.d 2006).

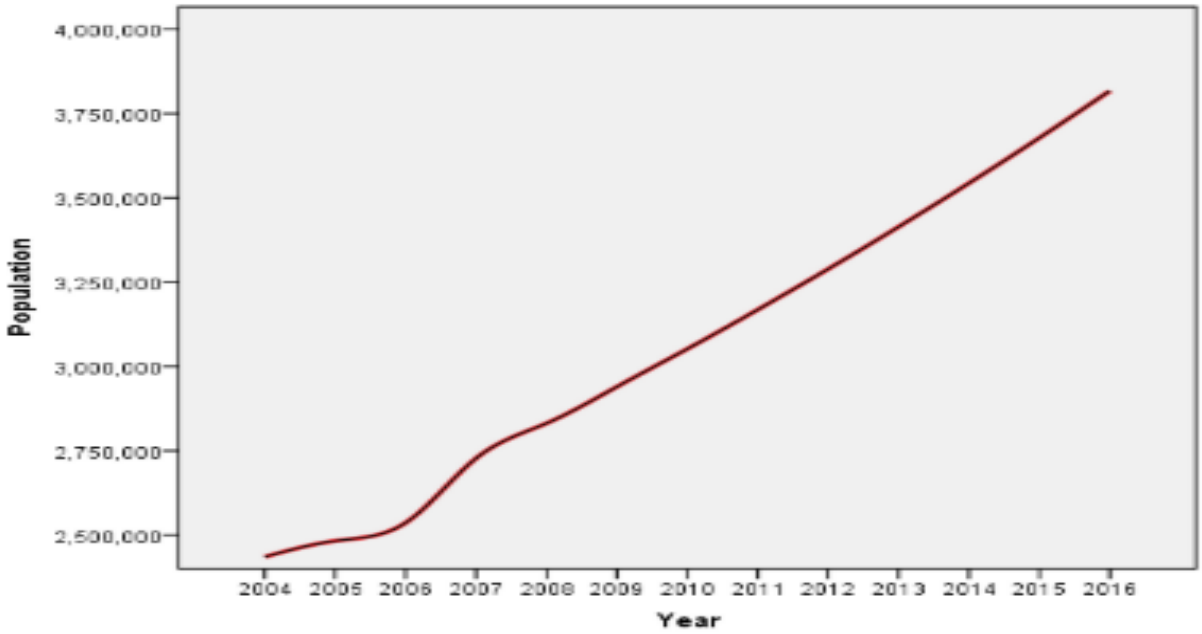

Figure 1 Growth of population in Kabul city

Health

The core metabolic requirements for human life are air, water and food in this order. A decrease in the quality or amount of any of these vital resources is an important threat to human health.

During the last 10 years, air pollution has gained in importance due to globalization of industrial production and energy needs and the increased number of acute air pollution episodes occurring in many cities all over the world, with increasing evidence of its dramatic health effects.

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The World Health Organization (WHO) considers air pollution to be the world's largest environmental health risk. Many studies showed its harmful effect on human health consistently. The polluted air in 2016, twice as much as AIDS, tuberculosis or malaria combined, is expected to lead to over 6 million deaths worldwide. The increased prevalence of a number of breathing and cardiovascular diseases, cancer, and even neurodevelopment disorders in children and adult neurodegenerative diseases has been associated with ambient particulates, nitrogen dioxides and other pollutants. Air quality data is increasingly available, and the science behind the associated impact on health is changing rapidly as well.

Health effects of pollution

Studies show that air pollution is linked to several adverse public health effects. These effects range from subclinical to premature death and include the following consequences in particular:

- Increased breathing disorders (bronchiolsis, rhino pharyngitis, bronchial hypersecretions),
- Lower respiration capability (asthma), cough;
- Eye irritation;
- Increasing cardiovascular morbidity;
- Depleted immune system,
- Impact on short-term breathing and cardiovascular deaths ;(Laxen, Kirk-Lloyd, & Beattie, 2017)
- Two central areas of concern remain health access and nutrition. 16.1 percent of Afghans say it improved when asked to explain the quality of their household's food in comparison with 12 months ago. This figure represents a decrease of almost 25 percentage points from a decrease of 40.9% in household food quality five years ago. In provinces with high rates of insurgent violence, poor nutrition appears particularly severe. For example, 75,9% of respondents in the province of Helmand indicate that the food quality has deteriorated in the last year in their diet, the worst in any province.

Afghanistan Environmental Law

Laws concerning environmental issues, sustainability and public health impacts were published by the Islamic Republic of Afghanistan Environment Act (or more known as the National Environmental Protection Agency) in Afghanistan on 25 January 2007. The Islamic Republic of Afghanistan therefore has the duty to protect human well-being, adopt and implement program, rehabilitate the environment, prevent and manage pollution, and inform the public that it can help make human health, environmental and natural resource decisions. The publication states further that the company must obtain a permit for the potential or current impact on the environment. This permit shall not be issued until properly informed and time is given for the immediate affected public to have a hearing in the community. The company will have to renovate every five years after the license has been granted. If the holder breaches permit conditions for any reason, fails to provide or discloses false or misleading information, he is sentenced to half-term jail and/or cash penalty equivalent to the damage caused.

CURRENT SITUATION IN KABUL

Roads condition

In and around Kabul city there is no bypass route to pass south to north or east to west so that a driver can avoid traffic crowding in the central area. Hence, the driver is forced to inflow to the city center congested and this situation has been accelerating the increase of traffic congestion in the city. The severe and lingering traffic congestion in Kabul is causing by several factors in need of improvement, including the lack of driving manners as evidenced by the forcible entry into the traffic flow at intersections and driving in the wrong direction. The arbitrary crossing of roads by pedestrians also causes the disorderly traffic flow of vehicles.

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Figure 2: Traffic activity and emission from vehicles.

Road Traffic

Being a poor country, people in Afghanistan are unable to afford to buy fresh car brand. Most of the country's vehicles being imported are outdated. There is no periodic technical inspection in the nation of vehicles being imported. "Most of Kabul's cars are over 10 years old and more polluting than contemporary ones. Vehicle emissions are regarded to be a significant contributor to air pollution. Kabul's air issue is compounded by the extensive use of under-standard car fuel and ancient motors. Kabul City was constructed for one million inhabitants with infrastructure and a peak circulation of 75,000 vehicles. But there are presently about five million inhabitants residing in Kabul and around the town circulate 400,000 vehicles excluding buses. High population densities in Kabul and an enormous amount of cars circulating around the town are regarded in Kabul to be the main factors for bad air quality (The Causes and Effects of air Pollution in Kabul April 28, 2012).

Vehicle Type	2002	2003	2004
Lorries/Trucks	51,527	76,236	83,374
Buses	29,098	40,042	40,590
Passenger Cars (small Cars and Taxis)	71,222	176,723	197,449
Motorcycle	13,189	10,458	12,237
Rickshaws	419	3,044	6,355
Total	175,355	339,601	402,422

Source: Ministry of Economy and Planning (2005).

Transportation

Road traffic activity and vehicle emissions are a major source of immediate air pollution in Kabul City. Transport is challenged with illegal imports of used vehicles, ongoing use of vehicles that are very old and poorly maintained (some of them over the age of 60), passenger and cargo overload, poor transport quality and limited air pollution road capacity. Mostly smaller cars and taxis, which together account for almost 50 percent of the entire car number, dominate the car fleet in Afghanistan. In Afghanistan in 2005 a Kabul vehicle census recorded 341.047 cars mostly small cars (66.2 %) and trucks in the vehicle population data of Afghanistan. It is estimated that the vehicle population will increase by around 11 percent per year. Unlawful imports of second hand vehicles in the country are also a major issue. Estimates of the number of these vehicles are around 300,000 and most are operated in Kabul. By 2003, the total amount of road network in the country was estimated to be 43,789 kilo-meters, of which 76.34% were not paved. Unpaved road contributes significantly to the recovery of dust. In Kabul, only 25 000–35 000 vehicles per day are estimated to be accommodated in the road system, which is not enough for the rapidly rising number of vehicles. There is also no road that supports the city center's dense traffic. (Country Synthesis Report on Urban Air Quality Management Dec 2006).

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Solid waste

Solid waste generation, types, and characteristics change during the four seasons of the year in Kabul. Many factors are involved in it, that force and put a sort of limitation on poor people to adjust themselves to the harsh winter by burning the waste for fuel purposes during the entire year which leads to weather and environmental changes. Waste treatment in Kabul is always an issue. Every day tons, before being thrown to the waste dumping point outside the capital, are collected from houses and street corners. The municipal workers mainly work at waste collection points, transport and waste collection from the main roads, waterways and transport them to waste sites; they do not collect waste from households. they do not collect waste. Dump sites and collection points are visible every- where around the city in a much-unplanned manner; landfills are situated approximately 16 – 20 Km away from the center of the city which is not standard at all(Torabi& Nogami, 2016).

Figure 3. Dustbins of solid waste along the road (by TORABI, 2016)

SUMMARY

This study's primary aim is to identify and handle the air quality condition and aspects in Kabul Afghanistan. The research is also directed at analyzing problems, managing and improving air quality through policy enhancements and also identifying future enhancement measures to improve air quality in Afghanistan. No significant epidemiological study on the effect of air pollution on public health, mainly owing to the failure of air quality information, was performed in Afghanistan. A number of newspaper papers report complaints from local citizens about the growing pollution and its health effects. The city of Kabul is under pressure and upper populated. In latest years, the city's ambient air quality has worsened so much that it can be categorized as one of the dirtiest towns in the world. Air Quality Monitoring (AQ) is at its original phases in the nation. Under an ADB-funded project, a Kabul air pollution surveillance network is being set up. A extensive inventory of emissions from various sources is being gathered through the Kabul ADB project in Kabul and two adjacent provinces. The first inventory of air pollution emissions in Kabul will be the country. The works of the ADB project include institutionalizing the emission inventory not only with the NEPA but also on a city-wide level. Inventory emissions have been shown to be the primary source of pollution in the town from mobile sources followed by generators. It was shown the principal causes of air quality deterioration are polluted roads, smoking and old vehicles still in use, tires and motor oil as fuel, together with plastic burning, urban sprawl, the bowl-shaped mountain landscape, which captures air pollutants and encourages inversion. The urban river, saturated with human waste, dirt, and soil, is transported along mountain roads through rain and snow. The mixture is based on the transmission of wind and moving traffic to very good powder and once dries. A large number of the necessary components of air quality management are still lacking, but with the recent establishment of NEPA, pending approval of the Environmental Act and air quality regulations, the recently installed AQ monitoring network of stations in Kabul, and the pending adoption and implementation of the air quality management plan, Afghanistan may be headed toward the right direction of building a good air quality management system.

There are several steps we can take to improve the air quality like avoid use of single use plastics as well as open burning of plastics and other waste, plant more tree, use eco-friendly mode of transportation like bicycle or take a walk if the distance to be covered is less, opt for technologies that can utilize unconventional or renewable sources of energy which does not contributes to air pollution like solar energy, wind energy. Avoid burning fire crackers during festival and occasions, quit smoking and spread awareness amongst the near and there ones as well.

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CONCLUSION

This research clarifies that air quality can be enhanced by various ways i.e. in Kabul and other significant towns in Afghanistan. Stricter testing and controls, town center car bans, promotion of e-mobility, more bicycle and public transportation space, and Greening the towns. Decreasing pollution of air would save lives and reduce the risks associated with many different diseases. Vehicle emissions are a major driving factor for air pollution. If governments do not control emissions from vehicles, the quantity of air pollution will improve exponentially. There are many ways in which governments can reduce emissions from vehicles. Offering busses and taxis enables more individuals to put out emissions in one car rather than more cars on the highway. Cities can also offer walking and cycling opportunities to enhance air quality. The Islamic Republic of Afghanistan therefore has the duty to protect human well-being, adopt and implement program, rehabilitate the environment, prevent and manage pollution, and inform the public that it can help make human health, environmental and natural resource decisions. After more than 3 decades of conflict, Afghanistan is busy rebuilding and establishing itself. A lot of preexisting services, facilities, and capacities have either been destroyed by war or no longer meet the growing demands of the population. As the economy grows, there are increasing demands for energy and mobility. Households and industries are forced to resort to using adulterated fuels and even garbage as fuels for heating and cooking second-hand vehicles using poor-quality fuel and with high rates of emissions are increasingly being imported into Afghanistan. The major sources of air pollution in Afghanistan are the transport and energy sectors. The country's main pollutant is particulate matter. The predicted ambient concentrations are very high and are likely to result in significant impacts on the health of the population. Toxic gas emissions may be expected from the use of plastic and rubber as fuels.

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