

## NOISE POLLUTION AND ITS IMPACT ON HUMAN HEALTH IN THAILAND: A REVIEW

N. VATTANAPRATEEP

*Department of Survey Engineering, Bangkokthonburi University, Bangkok 10700, Thailand*

(Received 9 December, 2019; accepted 23 December, 2019)

### ABSTRACT

Noise pollution has become a major threat to Thailand's environment in recent years. Not just in Bangkok, the capital city of Thailand, but noise pollution has been spreading throughout the country in all the cities at a rapid rate. With the capital city being the most crowded and holds the greatest number of traffic in comparison with other cities. Even the rural areas have become the target of this alarming threat. Noise pollution is caused mostly by industrial activities and different transportation modes. Thailand is a major hub for industrial and commercial activities, which counts for the huge percentage of noise pollution in the country. Superbikes and bikes are also very common in the country, which is a terrible thing, because they produce loud and sharp noises. Diesel-powered vehicles cause more noise pollution as compared to gasoline powered vehicles. However, in recent times the popularity of electric vehicle (EV), which emits very low noise pollution, has increased among the people of Thailand. Skytrain -BTS and Subway-MRT links in Thailand, which is the only transportation mode that causes the least number of noise pollution. Suvarnabhumi airport produces high levels of noise on a daily basis and people living near the airport are deeply affected by this ruckus and disturbance. The law enforcement agencies are taking major steps to reduce the levels of noise pollution in the country. The government has imposed tax on those who pollute the country, this regulation prevents the people from polluting the country.

**KEY WORDS :** Noise, Pollution, Traffic, Human health

### INTRODUCTION

The World Health Organization (WHO) has stated the sound levels less than 70 dB(A) are not damaging to living organisms. But, in Thailand the noise levels are way more than that. In 2018 the government of Thailand introduced a Department to protect the labor and work force in the workplaces against noise pollution, it is called 'Department of Labor Protection and Welfare (DLPW)'. The Department set a time-weighted average (TWA) sound level of 85 dB(A) as a noise exposure limit for 8-hour work day. Noise pollution is the production and distribution of harmful and dangerous levels of noise. As Thailand is developing and emerging as a well-established country, many people from all over the world are migrating to the country to permanently reside and conduct their

daily matters. As of 2019, there are approximately 4.9 million non-Thai residents in Thailand, which is a huge increase from 3.7 million in 2014. In total, the population of Thailand is estimated to be around 66.4 million as of 2018. This massive increase in the population is one of the major factors causing the rise of noise pollution in the country. Due to this surplus the number of vehicles registered per year in Thailand has been rapidly increasing throughout the years. In 2019 there are currently more than 40.7 million registered cars and 21 million motorcycles in the country, and the figures continue to go up in a quick rate. This amounts to the huge proportion of noise pollution in the roads of Thailand. People working on the streets and walking by get deeply affected by the pollution spread by different vehicles. In fact, the noise pollution caused by vehicles and traffic annoys and disturbs people the

most (Langdon *et al.*, 1976). This does not only take toll on their mental health but also their physical health. People who remain in the exposure of noise pollution get prolonged physical issues and even some diseases (Sheldon Cohen *et al.*, 1981). People who commute and work around loud noises and disturbances tend to have more issues with social interactions at home and workplace (Eldred, 1990). This is the reason that social conflicts and issues are rising in Thailand among the common population. There is a huge number of cases of road rage in Thailand, even in the event of a small accident or mistake people tend to argue very strongly and, in some cases, there are weapons involved too. All these frequent road rages are a result of the consistent noise pollution on the roads of Thailand. Apart from the roads, there are a number of activities that are causing distraction and noise pollution at residential areas such as, partying and celebrating. According to a study, out of all the complaints registered nationwide in Thailand, 33% was regarding noise pollution, especially about disturbing noises from neighbors having loud parties. The construction and manufacturing practices in Thailand also produce very disturbing noises and sounds. This pollution is not only harmful for the workers but for the passersby as well. Thailand has rapidly converted itself from a primarily rural country to a contemporary urban country. This happened because of nationwide industrialization and installation of factories. There are constructions happening all the time in all the cities of the country. Due to this, the rate of noise pollution has amounted to alarming and threatening figures. To reduce these figures the law enforcement authorities are working very hard and the government is also introducing many regulations and notifications regarding the rapid noise pollution.

#### **Sources of Noise Pollution in Thailand**

**Traffic:** According to an annual pollution report, the levels of noise exceeded the standards mainly due to the amount of traffic in the country. As Thailand is progressing, the traffic in the country is substantially increasing day by day. In almost all the areas of the country there is traffic, especially in the capital city Bangkok, where the levels of traffic are the highest in the country. Recently, a famous navigation company deduced Bangkok to be among the world's worst places for traffic. There are many areas in the city where the traffic is very congested.

Din Daeng road, Sukhumvit road, Petchaburi road, Rama IV road, Silom road, Sathorn road and Ratchadamnoen road are some of the most crowded and traffic infested areas of the city. Along with Bangkok, there are other cities with huge amount of regular traffic. Chiang Mai, Phuket, Pattaya, Phitsanulok and UbonRatchathani are some of the major where the traffic is much worse just like Bangkok. This poor condition of the traffic accounts for the extreme levels of noise pollution. Traffic congestion leads to horn-honking and long exposure to loud noises which just results in more pollution.

**Industries:** As aforementioned, Thailand has become an industrialized country through rapid urbanization. It is now the second largest economy in the Association of Southeast Asian Nations, because of the major industrial change and development. But this advancement of industrial and manufacturing activities has also brought some woes to the country. It is estimated that the increase in the industrial practices tend to deteriorate a person's hearing ability by a minimum of 20% (Limalemla Jamir *et al.*, 2014). There are huge industrial estates in Thailand that are responsible for producing so much noise pollution. Most of the country's industries are located in the Eastern Seaboard, and Ayutthaya and Pathum Thani. Some of the major industrial estates and parks in the country are Chonburi Industrial Estate, Amata City Industrial Estate, Pinthong Industrial Estate, Hi-Tech Industrial Estate, Bang Pa-In Industrial Estate and Saraburi Industrial Land. All the above industrial parks mainly contribute to the production of high levels of noise in the country.

**Automobiles:** Thailand is among the few countries to have almost every mode of land transportation. The automobiles in the country range from tuk-tuks to large trucks. The levels of noise pollution emitted from these different vehicles vary from sufficient to extreme. The ten-wheeled vehicles can cause up to 110 dB(A) of sound which is extremely above par. The superbikes produce up to 100 dB(A) level of sound pollution. A study deduced that pollution caused by vehicles is one of the major causes of noise pollution. And all these different automobiles are mostly powered by diesel in Thailand, which is harmful for the drivers and as well as for the environment. Even the prime minister of Bangkok has asked the drivers to refrain from using diesel-powered vehicles and only use it in case of an

emergency. Instead drivers should drive gasoline-powered vehicles to help reduce the pollution. There is also a new alternative which is eco-friendly and efficient, electric cars. Vehicles powered by electricity produce very low levels of noise pollution as compared to any other power source vehicles.

**Air Transport:** Thailand is among the top countries to have the greatest number of tourists in the world. In 2018, Thailand hosted around 38 million tourists and visitors. Due to this booming rate of tourism, there is a lot of air traffic operating to and from the country. In 2018, there were so much oncoming air traffic that some of the airports reached their maximum capacity. There are many airports in Thailand in the major cities. Some of the airports that face the most air traffic in Thailand are Suvarnabhumi airport, Don Mueang airport, Chiang Mai airport, Phuket International airport and Hat Yai airport. This huge traffic causes a lot of noise pollution, not just in the areas near the airport but all over the country. Aircraft noises spread annoyance to the people and also causes sleep deprivation. During take-off aircraft produces noise exceeding to 130 dB(A) which is non-acceptable and people working at the airport are affected the most due to this pollution.

**Railway Transport:** Even though there is a well-sustained system of Bangkok Mass Transit System (BTS) and Subway -Metropolitan Rapid Transit (MRT), there are still many people who travel by trains in Thailand. The BTS and MRT produce around 56-85 dB(A) of noise level. This is mainly because many people cannot afford to travel by BTS and that is why the railway system is still in operation throughout the country. Though, the train transportation system is financially feasible, it is not environmentally beneficial. Trains produce way more levels of noise pollution as compared to the levels released by BTS. The main station in Bangkok, Hua Lamphong Railway Station, is responsible for producing up to 90-120 dB(A) level of noise pollution.

**Late-Night Activities:** In Thailand there are various activities that happen after midnight and all these activities are usually associated with producing loud and disturbing amounts of sound. Night markets are one of the places that are filled with people at late night, with loud music playing. Many people are disturbed due to these night markets because of the loud noise. The levels of noise produced by night markets lie up to 90 dB(A) which

is clearly detrimental for the people participating in it and as well as for those who are not. Partying and clubbing tend to produce 120 dB(A) of noise pollution. Patpong, Khason road in Bangkok, Pattaya and Patong in Phuket are some of the most popular areas for late night activities and enjoyments.

These are some of the major sources that contribute to the exceeded levels of noise pollution in Thailand, and harm the environment. The unfortunate thing is that these sources continue to add up to the levels of pollution in the country.

### Effects of Noise Pollution on Health

Nowadays, noise pollution is increasing without skipping a beat in Thailand as a result of industrialization, population growth, urbanization and technological developments. This rise in noise pollution can affect in several major ways, which are listed and described below:

#### Sleep Disturbances and Cardiovascular Issues

Sleeping in a noisy environment can lead to serious problems. It is found that continuous exposure to noise while sleeping can cause high blood pressure and increased heart rate. This could be one of the reasons that hypertension is very common among the population of Thailand. According to a survey, one out of four Thais was suffering from hypertension.

#### Hearing Impairment

Most of the people in Thailand come into exposure with noise pollution during traffic, and in the country the traffic moves very slowly. This causes the people to remain surrounded by noise pollution for an extended period of time. People who get exposed to more than 120 dB(A) level of noise are prone to sudden hear loss. This also leads to permanent hear loss and poor hearing among the affected. Many people get tinnitus because of the loud noises and pollution.

#### Interference with Spoken Communication and Mental Health

Young adults who suffer from long exposure to noise have a tough time communicating and performing in social interactions. It even affects their future opportunities, which is a terrible thing to happen to any teenager. Those teenagers who are exposed to loud noises for a long period of time lose their ability to speak with clear speech. Noise

pollution causes slurring in speech and the victims tend to have problems while conversing on a daily basis. This causes them to go into chronic depression and other deadly mental illnesses.

### Effect on Unborn Babies

The wrath of noise pollution can even reach to the unborn babies. It is suggested by various studies that if pregnant women are exposed to the high noise produced by aircrafts, there might be a minimal reduction in the birthweight (Passchier *et al.*, 2000). This is concerning for many people in Thailand because a lot of people reside near the airport in the country.

### Negative Social Behavior and Annoyance

Living near a noisy place can also affect a person psychologically (Van Kamp *et al.*, 2013), it is reported that people who live near loud surroundings are prone to annoyance and unpleasantness. A study found out that those who were exposed to loud noises such as traffic and such, released more amount of stress hormones as compared to those who were not exposed to such noises (Ising *et al.*, 2004). This is the reason that the victims of noise pollution get annoyed and agitated easily as compared to the others.

### Diabetes among the affected

Exposure to loud and boisterous noises and sounds can lead to diabetes and high sugar problems. That's why it is not a surprise to find out that there is a large percentage of Thailand's population suffering from chronic diabetes. There are also a huge number of cases, where people die because of diabetes.

The effects of noise pollution are not only limited to health but it also affects the economy of a country. Due to so much pollution in Thailand, the productivity in the workplace has reduced greatly. It also causes poor efficiency in work among the employees and workers.

### Avoiding Noise Pollution

Some tips and actions that you can use/perform to avoid getting affected by noise pollution are listed below:

- 1) If possible, make sure you pick your residential area and working place in a secluded area with no heavy traffic.
- 2) Choose jobs that are not prone to loud and elevated sound levels.
- 3) Try to wear earplugs whenever in contact or

exposure with noise levels more than 85 dB(A)

- 4) Establishment noise monitoring and controlling centers.
- 5) Special pollution control tax and incentives to make sure that people don't pollute. Alongside with contributions and activities to reduce noise pollution.
- 6) Creating awareness regarding the harmful effects of noise pollution on human health and noise-related laws to the Thai public.

## CONCLUSION

This review focuses on the effects of noise pollution on human health in Thailand. It studies why the rate of noise pollution in the country has risen up so quickly in the past few years, especially in the year 2019. This paper gives an overview of the problems Thailand is facing due to noise pollution. According to the review, the main source of noise pollution in Thailand is the traffic. Until the problem of traffic is not fully solved, it is impossible to eradicate noise pollution from the country. Even if a quarter of Thailand's traffic is controlled there will be a massive drop in the levels of noise pollution. But the current situation is, the traffic is getting worse and the levels of noise pollution are rising rapidly with no indication of stopping. Due to these extreme levels the effects of noise pollution are getting really dangerous and lethal for the residents of the country. Among all the effects mentioned above in the review, the effect that affected the people of Thailand the most is 'Sleep Disturbance and Cardiovascular Issues'. A huge proportion of the population is suffering from lack of sleep and high blood rate and pressure. This is a very negative sign and does not bode well in the way of progression. To protect the country from the effects of noise pollution, the government has imposed many laws and regulations against polluting the country through loud noise and disturbance. It also has introduced taxes and charges againsts the violators of the laws. This is to stop people from polluting the country.

## REFERENCES

- Eldred, K.M. Noise at the Year 2000. In: B. Berglund and T. Lindvall (eds) *Noise as a Public Health Problem*. Vol 5. Stockholm, 1990.
- Ising, H. and Kruppa, B. 2004. Health effects caused by noise: Evidence in the literature from the past 25 years. *J Noise and Health*. 6 : 5-13.

- Langdon, F.J. 1976. Noise nuisance caused by road traffic in residential areas: Part II. *J Sound and Vibration*. 47: 265-282.
- Limalemla Jamir, Baridalyne Nongkynrih, Sanjeev Kumar Gupta, 2014. Community Noise Pollution in Urban India: Need for Public Health Action. *J Indian Journal of Community Medicine*. 39 : 8-12.
- Saba Ismail and Shahid Ahmed, 2016. Noise Pollution, Its Sources and Effects: A Case Study of University Students in Delhi, *J EPRA International Journal of Economic and Business Review*. 6 (2) : 15-23.
- Sheldon Cohen, Neil Weinstein, 1981. Nonauditory effects of noise on behavior and health. *J Social Issues*. 37: 36-70.
- Van Kamp, I. and Davies, H. 2013. Noise and health in Vulnerable Groups: A Review. *Noise and Health*. 15(64): 153-159.
- Willy Passchier-Vermeer, Wim F. Passchier. 2000. Noise Exposure and Public Health. *J Environment Health Perspectives*. 108 : 123-131.