

Air Quality Management

Public Perception Survey Study on Air Quality of Sri Lanka



This survey is carried out by Clean Air Sri Lanka in association with Air Resource Management Centre (AirMAC), Ministry of Environment and Renewable Energy, Sri Lanka, Fredskorspet, Norway, Sustainable Energy Authority, Sri Lanka, University of Moratuwa, Sri Lanka, Hong Kong Polytechnic University, Hong Kong and Clean Air Asia, Philippines.

Clean Air Sri Lanka (CASL) was established in 2004 as a non-stock, non-profit organization to work on combating air pollution. It operates as a partnership of a group of professionals and environmentalists from government organizations, private sector, non-government organizations, academe, and development agencies. It assists government agencies in implementing air quality management and climate change mitigation programs. In the government, CASL works closely with the Ministry of Environment and Ministry of Transport, among others.



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Air Quality Management Study— Public Perception Study on Air Quality of Sri Lanka

1. Introduction

1.1 Background

A report released by World Health Organization (WHO) estimated that around 7 million people died - one in eight of total global deaths – as a result of air pollution exposure in the year 2012. Globally, around 3.7 million deaths are attributable to ambient air pollution and 4.3 million deaths due to household pollution making air pollution. Today, air pollution is considered to be the single largest cause of deaths in the world. The South- East Asians and Western Pacific are more prone to this affliction and it is estimated to claim around 1.69 and 1.62 million lives every year respectively. ¹

A closer look at developing countries like Sri Lanka estimates death attributable to indoor air pollution and outdoor air pollution to be 4200 and 1000 deaths, respectively.² Children under the age of 5, elderly people are most commonly affected by the brunt of air pollution. The health of pregnant women and fetus are at risk when constantly exposed to the pollutants in the air. Health cases related to respiratory and cardio vascular disorders, strokes, lung cancer, eye and skin allergies are escalating every year in Sri Lanka. With several policy level interventions and strong monitoring procedures, the ambient air quality have drastically improved in Sri Lanka but management of particulate matter level in atmosphere is major challenge. A small percentage of particulate matter in air is significant enough to cause damage to human health. It is found that in the year 2011, PM10 related health damage in Colombo city alone cost around 5923321USD³. A study carried out in 1995 showed that diseases of the respiratory system were ranked as the leading cause of hospitalization.⁴

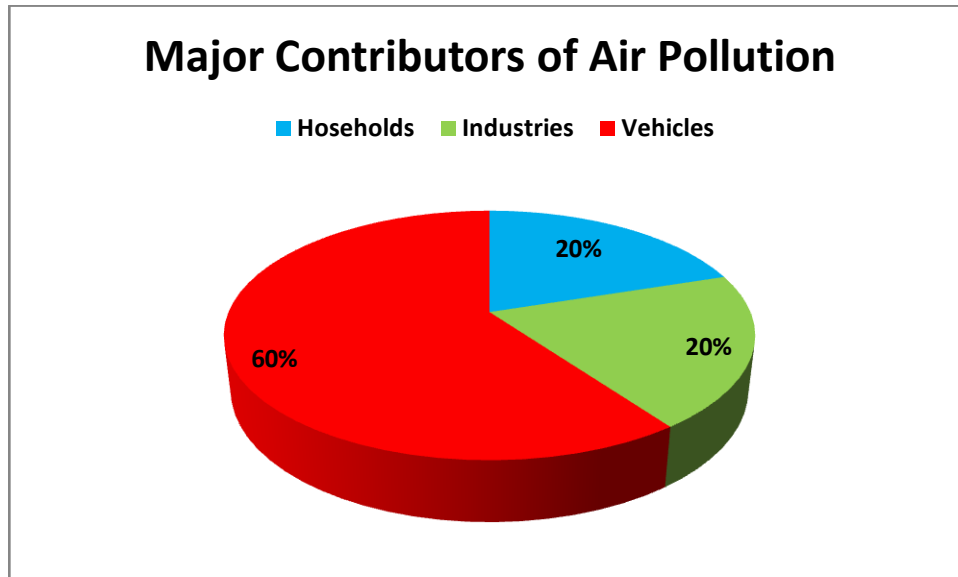
¹ http://www.who.int/phe/health_topics/outdoorair/databases/en/

² <http://www.sljol.info/index.php/JCCPSL/article/view/4932>

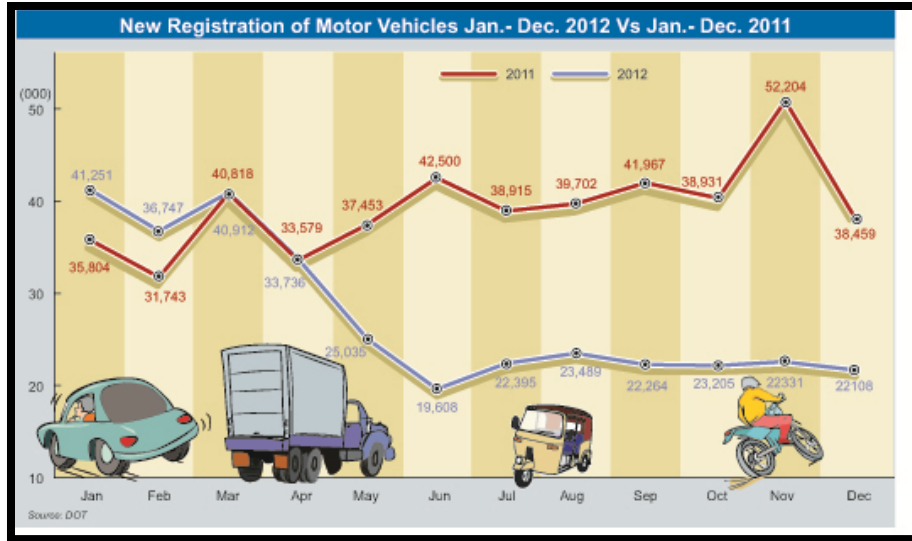
³ *Progress Report 2011 and Action Plan 2012*

⁴ http://www.yorku.ca/bunchmj/ICEH/proceedings/Senarth_C_ICEH_papers_489to501.pdf

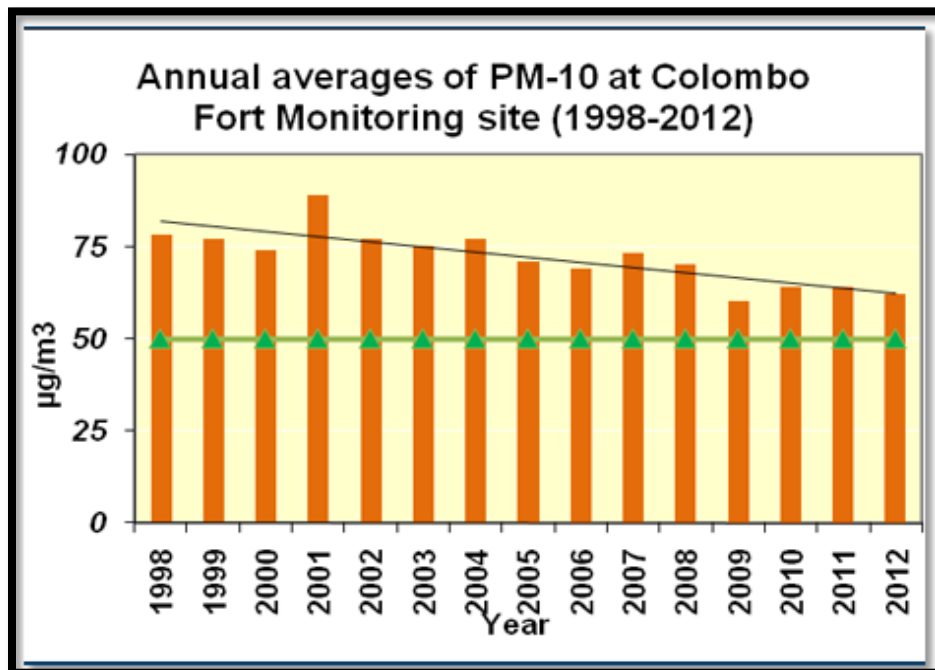
Air Pollutants, both indoor and outdoor have various sources like industries, vehicles, burning of biomass, smoking, several chemical and others. According to Sri Lanka's Action Plan 2012, vehicles alone contribute 60 per cent to the air pollution in the region.



A study carried out by Department of Motor Traffic, Sri Lanka made a comparative analysis on the number of vehicle registered for consecutive years 2010 and 2011. The study indicated that there was a remarkable increase in the vehicle registration for the year 2011 as compared to 2010. Increase in vehicle fleet on roads has contributed to problems like reduced health conditions, traffic congestion, lower walkability index and others. Considering the situation to be grave, amendments were made in governmental policies. The National Environment Act integrated some of the stringent policies which helped Sri Lanka in monitoring air emissions. Stringent air emission standards, higher tax on imported cars, ban on 2-stroke vehicles/imported used passenger vehicles, promotion of electric and hybrid cars are some of the initiatives that were taken in this direction. These events manifested and dropped the vehicle registration figures in December, 2012.



Studies carried by Central Environmental Authority, a governmental body under Ministry of Environment and Renewable Energy (CEA) reviewed the air quality standards in Sri Lanka as per the WHO guidelines. Under the 2008, National Environment Act, PM10 and PM2.5 were incorporated in the air quality standards. The study carried out by CEA projected that level of various pollutants (SO₂, NO₂, CO, O₃, VOC, etc) have been under the WHO limits. However, a comparative analysis on PM₁₀ reveals that the pollutant level has relatively been stable within 70-80 micrograms per cubic meters (70-80µg/m³). This was found to be much higher compared to WHO guidelines which indicate the maximum permissible level to be 50 µg/m³.



Source: <http://ceanew.lankapanel.biz/index.php/en/air-quality>

1.2 Purpose

The government is taking several initiatives for improving air quality in Sri Lanka. Much of the policy level discussions take place amongst practitioners, policy makers, research and development institutes and others. The general public which is a major stakeholder is many at times overlooked in the national policy development strategy. It is very important to integrate public opinion in the national development policies. Awareness and information sharing is one of the key features that helps in mitigating health risks associated with air pollution. The survey on Air Quality Management in Sri Lanka is carried out with general public and the response generated will be used to project public perceptions that could be utilized by decision makers in policy development.

1.3 Objective

The objectives of carrying out this survey were to:

- Determine public perception on air quality management in Sri Lanka
- Identify and rank the national policy depending upon its functionality and priority in improving air quality in Sri Lanka
- Recognize the leading health hazard associated with air pollution
- Engage young volunteers from University in the survey study thereby promoting participation and skill development

2. Survey

Survey Sample and Methodology

Four areas were targeted to carry out this survey. The objective was to have a heterogeneous sample size with diverse opinions, different socio and economic background. The four areas selected were—

- Petta- Public Transport Terminal
- Battaramulla- Residential Area
- Unity Plaza- Commercial Complex
- University of Moratuwa- Educational Institution

Volunteers from University of Moratuwa were engaged in the survey study. The survey sheets were translated into local language, Sinhala for better public participation. The survey sheets were distributed to the public for receiving their feedback on air quality of Sri Lanka. In total 293 filled survey sheets were received from the four locations.

3. Observation and Survey Response

This report is based on the feedback received from the respondents from Colombo city. We received 293 responses with an overall response rate of 58.6 per cent.⁵



⁵ Response rate was calculated on the basis of total number of survey sheets distributed and number of filled survey sheets. Some survey sheets were not considered relevant as they were unfilled or did not have sufficient information. Total sheets distributed=500. Total filled sheets received= 293. Response rate= $293/500 = 58.6\%$

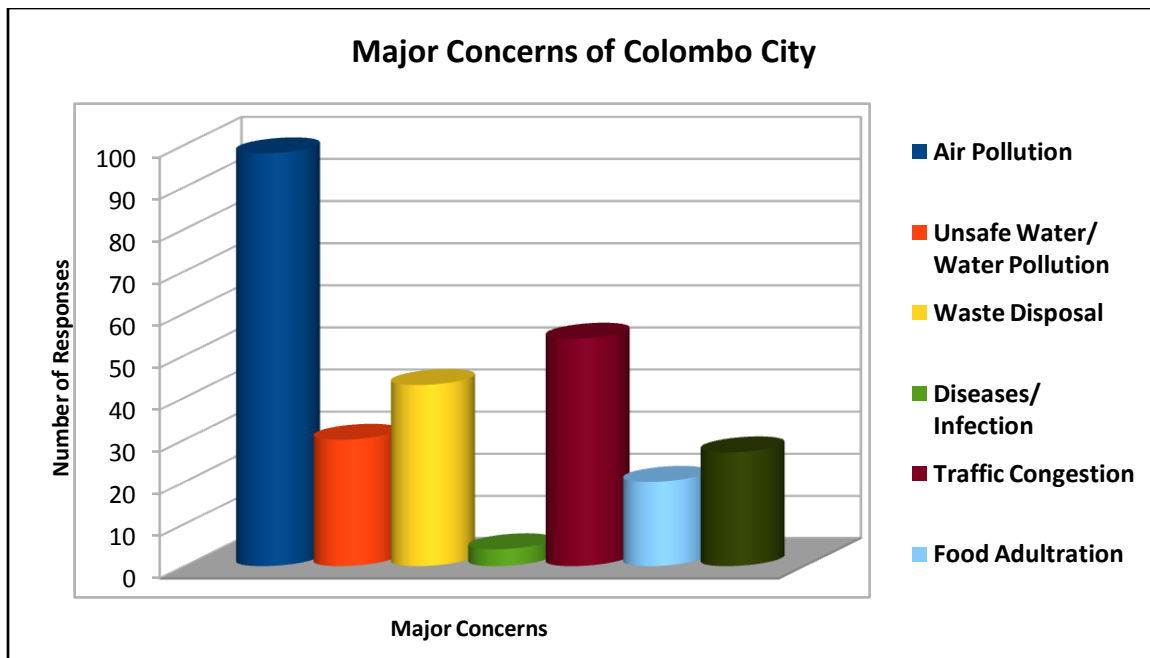
Question 1

Which amongst the most is affecting your city?

The respondents were asked to rate following concerns depending upon the threat imposed on their neighborhood area.

- Air Pollution
- Unsafe Water/ Water Pollution
- Waste Disposal
- Diseases/Infection
- Traffic Congestion
- Food Adulteration
- Loss of green areas

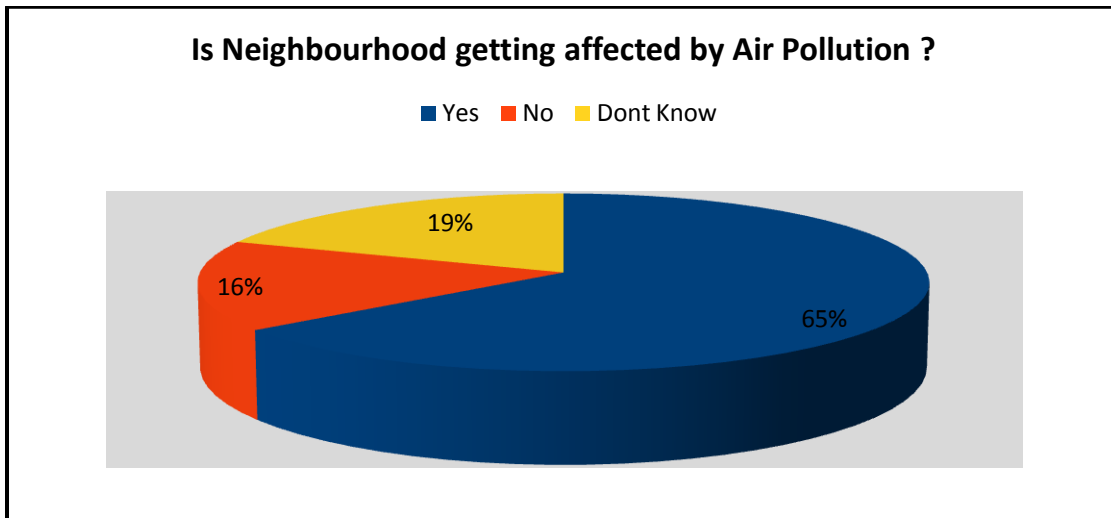
The survey sheets were analyzed and it was found that 'Air pollution' is considered to be a major threat to the city. This was followed by traffic congestion and waste disposal. This was basically because of the growing population and demand for more vehicles on roads. Though efforts are being taken to monitor vehicle ownership, demand for improved fuel quality, demand for advanced technology and better traffic management systems are still unaddressed or in the primary stage of development.



Question 2

Do you feel that your neighborhood is affected by air pollution?

The pie chart illustrated below depicts the perception of respondent to this question. Around 65 per cent responded Yes to this question as they felt their neighborhood is being polluted due to poor air quality. Contrary to this, 15 per cent felt that the air quality is good with no threat imposed on environment and public health. However, 22 per cent were unaware about the impact of air pollution. This is basically because Sri Lanka does not witness effective public participation in awareness and implementation strategies. Education and awareness is one of the greatest challenges that is making it difficult for government to implement monitoring strategies. A survey carried out by the National Institute of Health showed that higher the education level in Sri Lanka, lower the observed use of wood. Approximately 65 per cent of females who have an education level higher than grade 10 use biomass fuel, while 95 per cent of the females who have only primary schooling or an even lower level of education use biomass fuel⁶.

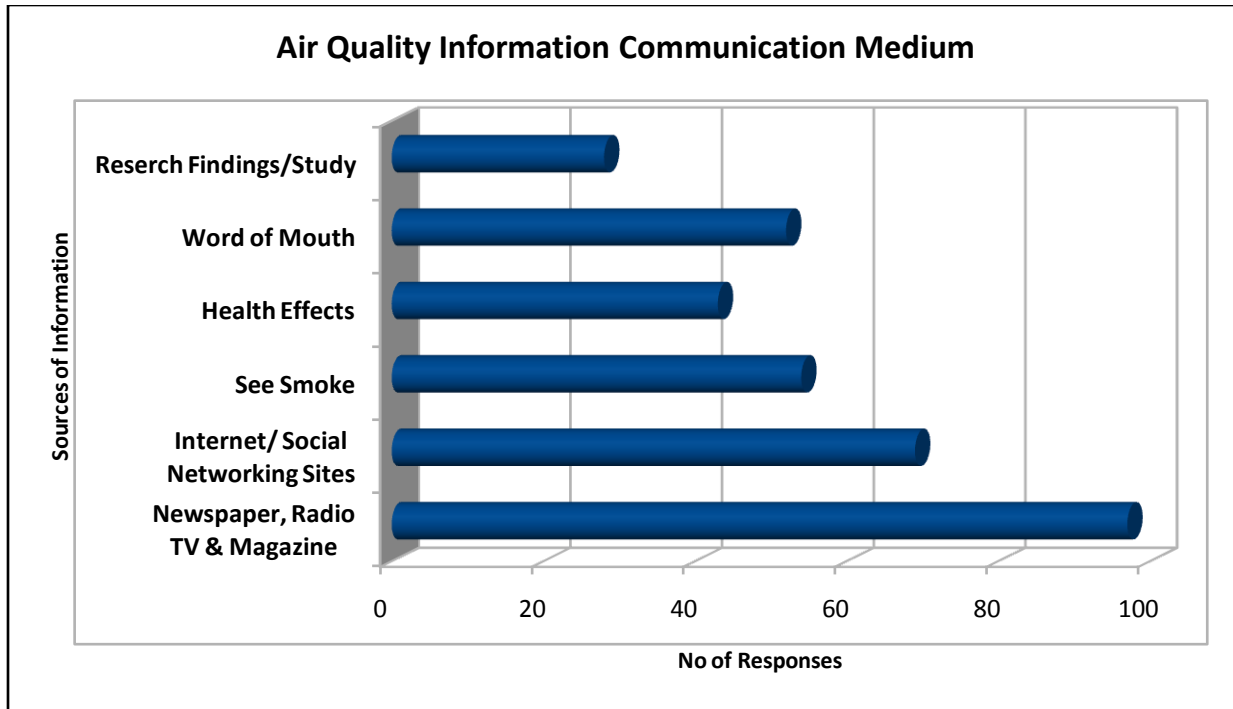


Question3

What medium/mediums is/are used for receiving information on air pollution?

Survey sheets analyzed showed that sources like print and electronic media, research papers, journals etc were commonly referred for accessing updates and receiving notification on air pollution. Print media, television and radio were the major medium used for knowledge transfer. Journals and research studies on air pollution was the next medium to comprehend poor air quality.

⁶ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3366602/>



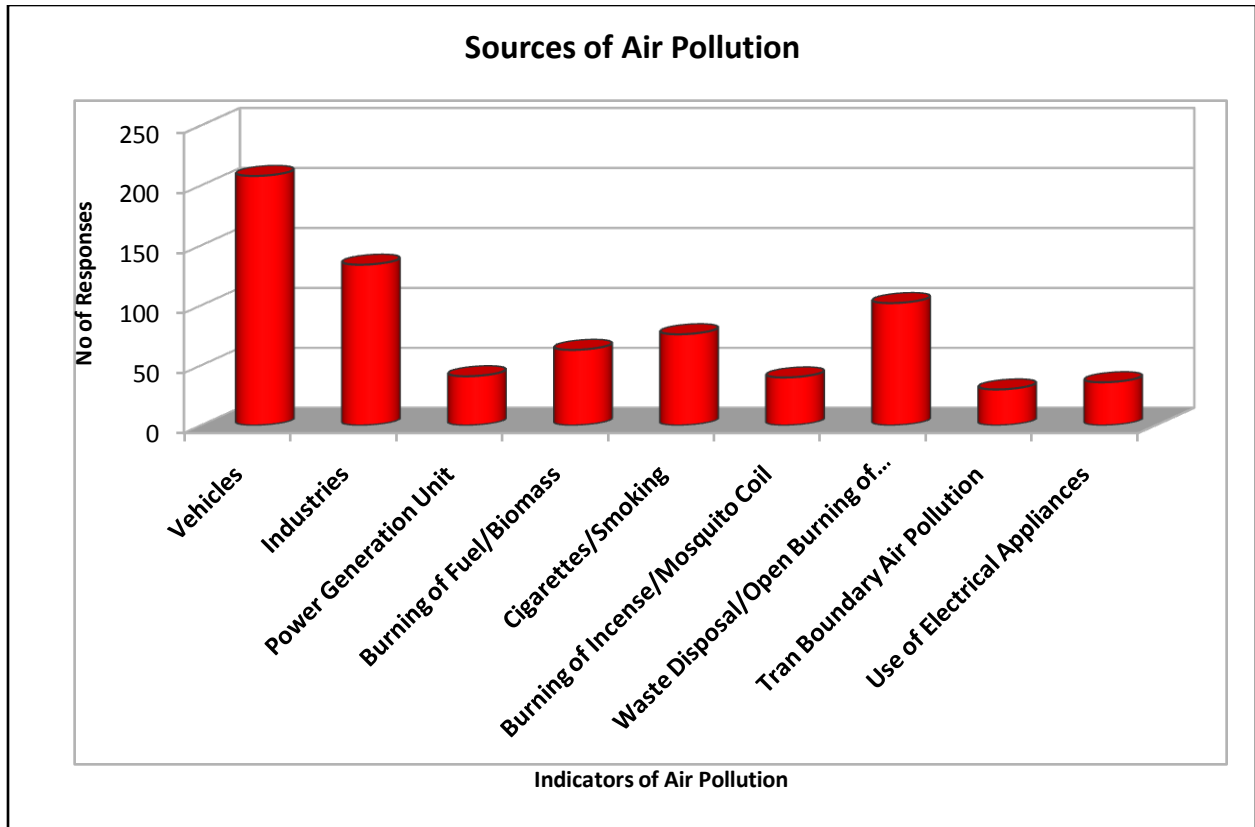
The various mediums have been ranked as listed in the below table.

Air Quality Information Medium	Rank
Print media, TV, Radio	1
Research study	2
Hazy weather and smoky air	3
Word of Mouth	4
Health effects	5
Internet and Social networking sites	6

Question4

What do you think is the source of air pollution in your neighborhood/city?

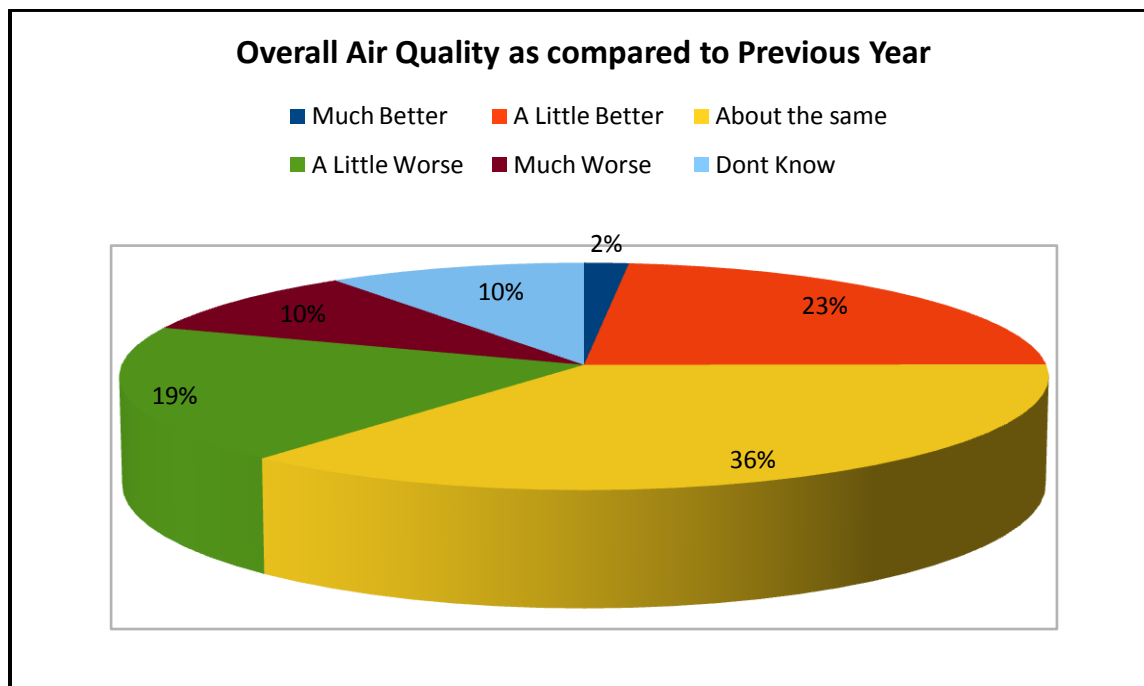
Similar to the Government's 2011-12 Action Plan report the survey responses accounted that majority of the air pollution in the region is contributed by vehicles. A study carried out by CEA showed that pollutant PM₁₀ is emitted mainly from diesel powered vehicles, which constitutes light duty vehicles, buses and trucks. The study also indicated that the emission levels are highest in light duty diesel vehicles, which contributes 2/3rd of the total particulates emitted.



It was also observed that respondents selected more than one source of air pollution. Industries and burning of fuels/biomass also received votes for their contribution to the deteriorating air quality.

Question 5

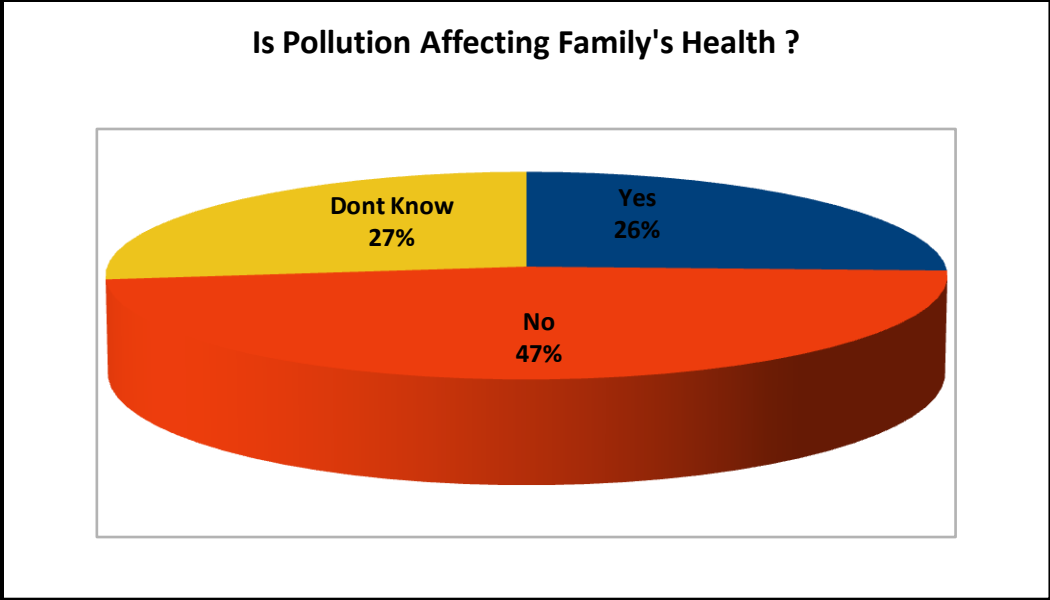
How do you rate the overall air quality in your city now compared to last year?



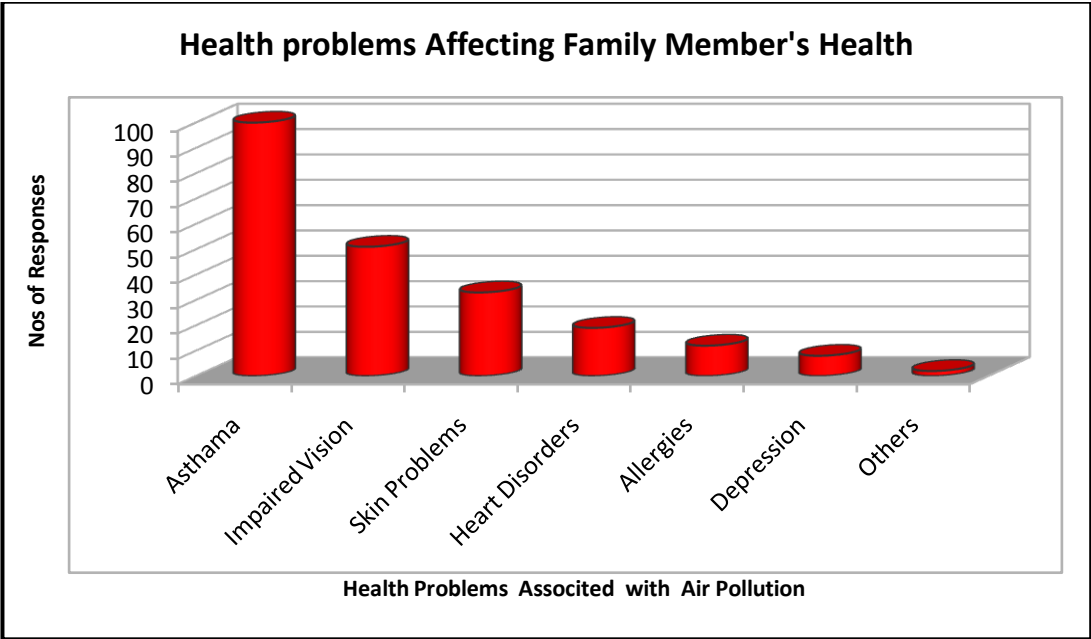
A large number of respondents believed that the air quality hasn't changed much when compared to last year. Around 10 per cent were unaware about the situation as they felt not enough information has been provided to them on air quality. Community level participation for improving air quality is considered to be a big challenge in Sri Lanka. Consultation and workshops are carried out by the government for tackling air pollution in the region but the general public is unaware about the developments happening at policy level. Efforts are being taken into this direction so that information and awareness could be shared with the masses.

Health Risks Associated with Air Pollution

Question 6, 7 and 8 were based on the health risks and economic losses associated with air pollution. Question 6 inquired respondents regarding the health risks related with air pollution. Only 27 per cent of the respondents felt that continuous exposure to air pollutants leads to reduced health, poor quality of life and financial losses. 27 per cent were unable to respond to this question as they couldn't relate the diseases and sickness with poor air quality. A few also felt that the diseases could be either an integrated or individual impact of air pollutants and other disease causing agents—disease causing vectors, chemicals, climate conditions etc.



Out of 26 per cent who answered ‘Yes’ to the above question also responded to the next question which inquires about the kind of diseases that they/their family members are affected due to poor air quality. A majority claimed respiratory diseases and asthma as the major health risk associated with air pollution. Increased vehicle fleet and traffic congestion are making it very difficult for young children and elderly citizens to breath. Women who are continuously exposed to smoke while cooking are also at high risks. Over 78% of Sri Lankans use biomass fuel for cooking, the major source of indoor air pollution in developing countries. 84% of these households are in rural areas, and 96% are households on rural estates. Even in urban areas, over 34% of the population uses wood as their main fuel source.



Reduced health and poor quality of life due to air pollution results in several economic losses. PM10 related health damage in Colombo city alone cost around 5923321USD in the year 2012. This section was mostly left unanswered by the respondents as they did not know the exact money that was spent on the diseases associated with air pollution. Secondly, a very little information is known about the diseases caused due to poor air quality.

“I really don’t know if I have breathlessness because I am exposed to smoky air every day. The health professionals never blamed air pollution for my health issue.”—

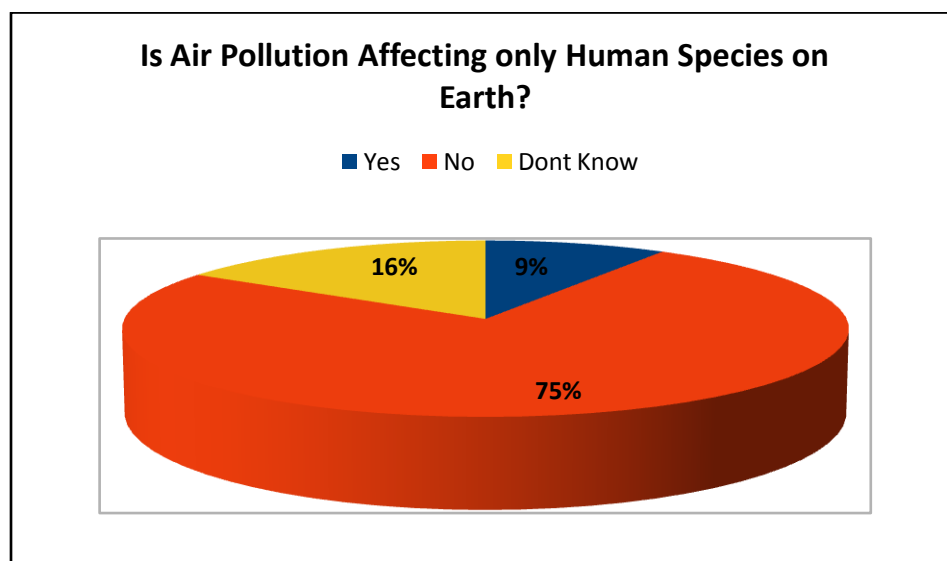
A Respondent from Pettah, Bus Stand

Question 9

Do you think that air pollution is only affecting human species on earth?

75 per cent felt that air pollution is a threat to human health and surrounding environment. Many of the respondents mentioned about the hazards related to air pollution like

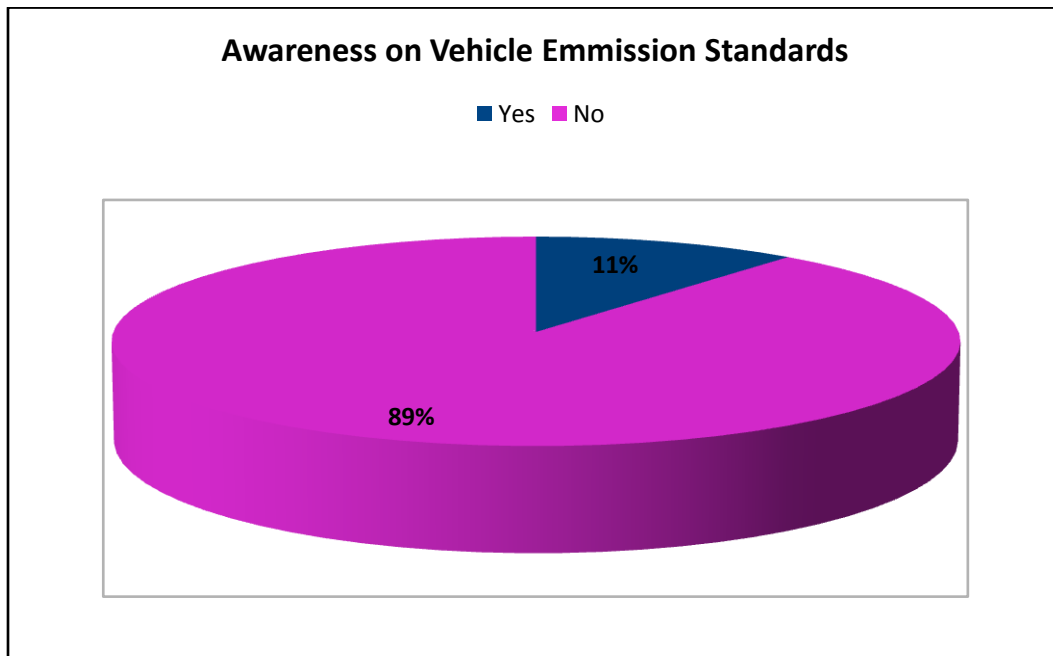
- Loss of biodiversity
- Unpredictable climate conditions
- Rise in food insecurity and poverty
- Damage to building and monuments
- Low economic development



Question 10

Do you know the existing emission standard limits upto which your vehicle can release toxic pollutants into the atmosphere?

Similar to question 2, respondents were unaware about the existing frameworks made by government for reducing pollution levels in Sri Lanka. Only 11 per cent answered yes to the question which indicated that the awareness level is still at a nascent stage. The 11 per cent population mainly comprised of respondents who were working, or studying in areas related to air pollution.

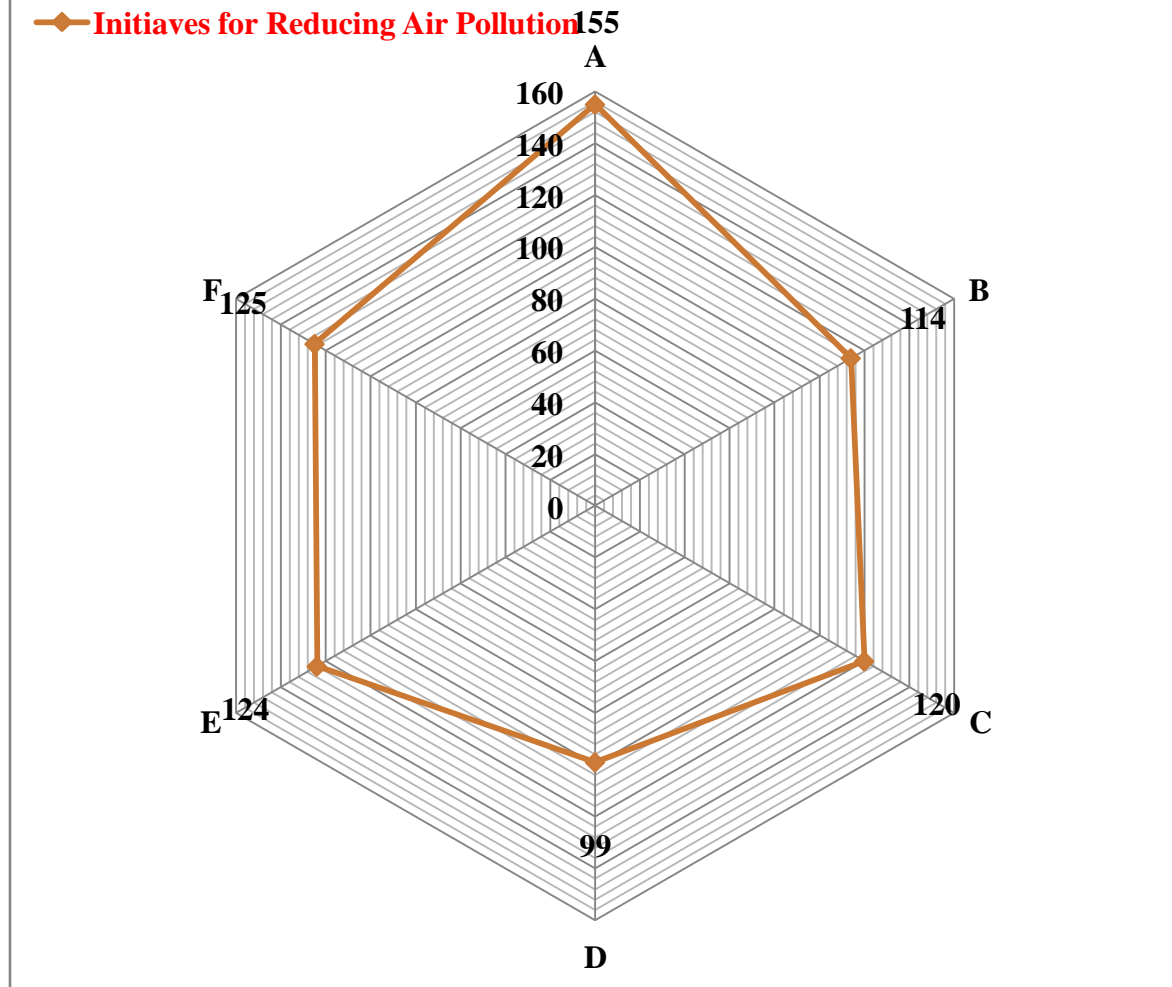


Question 11

What initiatives should be taken to reduce air pollution in your region?

The survey sheet carried recommendations which may be used for tackling air pollution in the region. The respondents were asked to rank these recommendations on the basis of their priority and functionality. Based on the feedback received, recommendations were ranked in the order of A to E.

Rank the Initiatives/Policies that will help in Monitoring Air Pollution



- A. Monitor and ban vehicles that fail emission tests and prohibit old vehicles from entering city limits.
- B. Stronger and mandatory legal framework should be implemented by the Government which prohibits industries, vehicle owners and others to emit pollutants into the air. Or shift polluting industries to outside the city limits.
- C. Government should establish air quality plans, both short and long term plans that look at controlling emissions from all sectors
- D. Industries and power sectors should adopt innovative and eco-friendly technologies for controlling and monitoring the release of emissions into the air.
- E. Improve the quality of fuel and establish independent fuel quality testing mechanism

3. Limitations and Mitigation Plans

3.1 Limitations

Even though the survey went smoothly, there were a few hurdles that the team faced while interviewing respondents. Some of them have been listed below:

- A few of the respondents did not take the survey due to lack of time and information. Out of 500 sheets only 293 sheets were filled as some were left blank or due to unavailability of relevant information.
- Many of the respondents were unaware about the topics covered in the survey sheet. Lack of knowledge sharing and information access is a major challenge which made it difficult to answer the questions.
- Communication was another obstacle as a few respondents spoke only in Sinhala while others in Tamil. A very few respondents understood English language which made it difficult to communicate.

3.2 Mitigation Plans

Sri Lanka is fortunate enough as the nation hasn't faced major problems associated with air pollution. However, development and growing demand for more vehicles, industries could possibly bring it closer to the threats imposed by pollutants. It is important that government take strong initiatives which are sustainable and improves the quality of life. In order to understand these sustainable action plans the team met officials working on programmes and project related to air quality improvement. The officials were interviewed for the development of recommendation list which comprises of various sustainable actions that need to be taken for combating air pollution.

The Mitigation Plan

- Stronger and mandatory legal framework should be implemented by the Government which prohibits industries, vehicle owners and others to emit pollutants into the air. Shift and prohibit polluting industries and vehicles respectively to outside the city limits.
- Provide more funds to the research institutions for introducing cleaner fuels and improved public transport system in Sri Lanka.
- Promote and subsidize tax on industries that use renewable sources of energy.
- Introduce three wheelers with CNG tool kit and hybrid/electric cars for lowering the emission levels.
- Regularly update the online air emission standards.
- Awareness and training programmes like stakeholder consultations, workshops, campaigns should be carried for spreading the message across a larger population.
- Community level participation for improving air quality should be encouraged.
- Air pollution and related topics should be introduced in academics both at formal and non-formal education.
- Use media, issue articles, magazines, newsletters that promotes awareness and mobilize public participation.

ANNEXURE 1



AIR QUALITY MANAGEMENT SURVEY SHEET

SURVEY SHEET

This survey is carried out by Clean Air Asia (<http://cleanairinitiative.org>) in order to understand the issues related to air quality management in your city/neighborhood/local area. Your responses will remain confidential with us. Please spare a few minutes for filling up the survey sheet. We appreciate your participation.

PERSONAL INFORMATION

Name:

Gender:

Age:

Profession:

Email Id:

Neighborhood/ Residence/City:

Country:

SURVEY QUESTIONS

Please select the most appropriate answer.

1. Which amongst the most is affecting your city? Based on the impact, rank the issues in the order of 1-3.

- Air Pollution
- Unsafe Water/ Water Pollution
- Waste Disposal
- Diseases/Infection
- Traffic Congestion
- Food Adulteration
- Loss of green areas

2. Do you feel that your neighborhood is affected by air pollution?

Yes

No

Don't know

3. If your answer is yes for the above question, how did you come to know about it? Tick the options

- Newspaper
- Radio
- TV
- Magazine
- Internet/Social networking sites
- See smoke
- Health effects
- Word of mouth
- Research findings/study

4. What do you think is the source of air pollution in your neighborhood/city?

- Vehicles
- Industries
- Power generation unit
- Burning of fuel or biomass
- Cigarettes/ Smoking
- Burning of incense/mosquito coils
- Waste disposal/open burning of waste
- Tran boundary air pollution (pollutants coming from other countries)

- Use of electrical appliances like air conditioners, refrigerators, generators etc

Please mention the source below if not listed

5. How do you rate the overall air quality in your city now compared to last year?

- Much better
- A little better
- About the same
- A little worse
- Much worse
- Don't Know

6. Does air pollution affect your health/family member's health?

Yes

No

Don't know

7. Which of the health issues seem to affect your/family member's health? You may select more than one.

- Asthma/ difficulty in breathing
- Impaired vision/itching of eyes or throat
- Skin problems
- Heart related disorders
- Allergies
- Depression
- Others

Others, please specify _____

8. How much money do you spend annually for the below listed diseases?

- Asthma/respiratory diseases
- Heart related disorders
- Eye irritation
- Depression
- Blood related disorders
- Any other diseases linked with air pollution

- Don't Know

_____ USD/LKR

9. Do you think that air pollution is only affecting human species on earth?

Yes

No

Don't know

If your answer is No, please describe how others are affected by air pollution.

10. Do you know the existing emission standard limits upto which your vehicle can release toxic pollutants into the atmosphere?

Yes

No

Don't know

If Yes, please mention the limits _____

11. What initiatives should be taken to reduce air pollution in your region? From the following options mentioned below please select any 5 and rank them in the order of 1 to 5 depending upon the priority list.

- Monitor and ban vehicles that fail emission tests and prohibit old vehicles from entering city limits.
- More stringent the existing emission standards
- Improve the quality of fuel and establish independent fuel quality testing mechanism
- Improve public transport and reduce private vehicles on the road.
- Industries and power sectors should adopt innovative and eco-friendly technologies for controlling and monitoring the release of emissions into the air.
- Government should establish air quality plans, both short and long term plans that look at controlling emissions from all sectors
- Stronger and mandatory legal framework should be implemented by the Government which prohibits industries, vehicle owners and others to emit pollutants into the air. Or shift polluting industries to outside the city limits.
- Community should step in for implementing strategies that keep a check on emission.

- Awareness programmes like stakeholder consultations, workshops, campaigns should be carried for spreading the message across a larger population.
- Recycling programs should be put in place and promoted across the whole city.
- I alone can't contribute.
- I am not interested and I don't see it as a problem.

12. Any action that you take or would like to take to reduce air pollution.
