

Workshop on Air Quality and Environmentally Sustainable Transport

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Dialogue

Air quality and Sustainable Transportation Challenges -- Towards Clean and Livable Cities in South Asia: A briefing note

The South Asia dialogue series on clean air and sustainable mobility in South Asian cities is part of the ongoing effort of the New Delhi based Centre for Science and Environment to find the solutions to the scary air pollution challenge and the mobility crisis facing our cities today. This is part of the effort to engage with the policy makers and people of the South Asian cities to deepen public understanding and strengthen the policy action on air pollution and urban mobility and also share lessons from Indian cities like Delhi to chart the future course of action.

Delhi and Colombo both are rapidly growing cities in the South Asian region. There are already serious concerns about the likely adverse impact of motorization in these emerging cities. While the mega metro cities have an acknowledged transport crisis that has attracted major planning efforts, and extensive large-scale investment, the remaining cities largely remain neglected. For effective management of air quality and transportation, the cities in the region must take note of the emerging learning curve at the early stages of motorisation.

At the same time each city will have to address the unique local challenges and potential and work according to its own imperatives. So far strong public opinion, judicial and executive actions have come into play to accelerate action in Delhi and other Indian cities. The common minimum programme has evolved with milestones and timeline based on the first generation action in cities. The city action plans on clean air and mobility have created an opportunity for change. This provides the framework for controlling different pollution sources – transport, industry, power plants and helps to achieve the balance between the composite action and priority action. This experience can be used to inform action in other South Asian cities which are facing similar challenges.

What are the key challenges in our cities today?

The South Asian cities of Colombo and Delhi are falling into the toxic grip of motorization as well as dieselisation without clean vehicle technology and fuels. This is worsening the air pollution related public health crisis. At the same time their sustainable urban commuting practices – bus usage, cycling, walking etc are under tremendous pressure. Sustaining them will be the toughest challenge. Both the cities have begun to take action to cut pollution but this must build momentum to curb the toxic threat and the growing energy guzzling in the region.

Delhi, one of the most polluted cities in Asia has made strides in meeting air quality challenges, but it has also slipped and made terrible mistakes of promoting pro-car policies and also slowed down the improvement in vehicle technology and fuel quality to meet the global clean benchmark. As a result, speed of change has overwhelmed the initial gains.

Colombo can take note of Delhi's experience and initiate preventive policies quickly – leapfrog to clean vehicle technology and fuels as well as strengthen sustainable mobility practices – bus, walking and cycling. . In fact Colombo is fortunate to have the advantage of its strength in high current usage of public transport – more than 60 percent. Colombo has the opportunity to build on this advantage and strength and avert the crisis.

The rapid review of the emerging information in these two cities has brought out the unique challenges and potential of this sub-region in South Asia: Vehicles pose a special challenge in the region. The numbers are increasing rapidly and emitting noxious emissions within the breathing zone enhancing the public health risk. : In Colombo vehicles are responsible for 60% of the air pollution load, in Delhi –more than 70%. This demands urgent and immediate intervention.

What are the serious concerns associated with air quality and vehicles in our region?

The region needs to strengthen air quality monitoring and risk assessment

- Expansion of air monitoring grid has just about begun in the region. Delhi has expanded its monitoring network and also included more pollutants including PM2.5 and ozone for monitoring. In the meantime the new ambient air quality standards have also made provision for monitoring of PM2.5, ozone and air toxic on a nationwide scale. This will now have to be done with clear milestones and deadline.
- In Colombo the discussions have started to improve the monitoring system. At the moment air quality monitoring is done only in the Fort area which is close to the sea. But the experts from the University of Colombo and others have pointed out that the grid should be expanded and more suitable localities should be identified for better risk assessment.

Emerging health concerns

- Indian as well as Sri Lanka cities have begun to generate their own evidences on health impact of air pollution. Quite a few studies have been carried out in Indian cities that bring out the magnitude of the scourge.
- Similar evidences have begun to emerge in Colombo. According to the studies carried out by Prof Oliver Illeperuma of University of Colombo 45% of the total outpatient morbidity in two leading hospitals was due to diseases of the respiratory system. Diseases of the respiratory system even after excluding diseases of the upper respiratory tract, pneumonia and influenza has ranked as the second leading cause of hospitalisation in Sri Lanka over past 5 years and it has become the second leading cause of death among children aged 5 – 14 years.
- Another study carried out by Prof. Amal Kumara, University of Moratuwa has estimated health damage due to fine particles(PM10) at Rs. 32 billion for the city of Colombo alone. Lag in vehicle technology and fuel quality adding to the public health crisis in our cities.
- Only rapid, aggressive and effective action can help these cities to protect public health.

- **Technology lag:** The region is suffering from serious technology lag and is far behind the global clean emissions benchmark. The region is motorizing at a poor level of vehicle technology and fuels. Colombo has initiated Euro I/Euro II technology that is far behind Europe. India has just about implemented Euro III/ Euro IV but is still maintaining a lag of at least 5 to 10 years with Europe.

The region can beat its pollution problem if the new vehicles emit as little as possible and therefore technology improves as quickly as possible. Otherwise, polluting technology will continue to grow and also continue to pollute for a much longer time as the fleet turn over rate is slow. This will also lock up climate forcers as well as the toxics. The region is generations behind the near zero emissions targets and the current regulations are not technology forcing. If we delay decision we will suffer the adverse consequences. In fact the limited monitoring carried out by the research bodies in Colombo and Candy show that these cities are also falling in the grip of particulate and NOx pollution.

- **The region is in the grip of deadly dieselisation:** The current level of diesel technology and fuel quality represents very special risk. Diesel vehicle fleet is expanding in a maniacal pace – especially in India. This has serious public health implications. In India the diesel cars are already 30% of the new car sales and is expected to be half soon. In India cars are already the second highest user of diesel in the country as it is taking advantage of the low taxed diesel meant for agriculture, freight etc. Diesel combustion is responsible for high PM2.5 levels in Indian cities. Studies have shown that its share can go as high as 61% during winter in cities like Kolkata.

Similarly, in Colombo and Sri Lanka diesel vehicles are 45% of the total fleet that already use up more than 90% of the diesel fuel. The policy to undertax diesel fuel and maintain a wide gap with petrol prices is largely responsible for this trend in the region. Also import policy is aiding dieselization in Sri Lanka: Studies in Sri Lanka have attributed Rs 22-17 billion to health damage cost owing auto diesel emissions in Colombo. Diesel vehicles are responsible for 96%-89% of SO₂ and PM₁₀ from the transportation sector (University of Colombo). But Colombo which is primarily a vehicle importing country has also taken the stand to tax the diesel cars much higher than the petrol cars. This has in fact helped to arrest the trend in dieselization recently.

There are serious health concerns over increased use of high sulphur poor quality diesel. Total air toxics from a diesel car that are very harmful and carcinogenic are 7 times higher than petrol cars. The International Agency for Research of Cancer (IARC), WHO, United States Environmental Protection Agency, etc have all classified diesel emissions as carcinogenic. The evidence from India shows that Euro III diesel cars that are sold across India emit 7.5 times more toxic particulate matter and 3-5 times more NO_x than comparable petrol cars.

Diesel cars may emit less carbon dioxide emissions compared to their petrol counterparts as they are more fuel efficient. But even this benefit gets negated as diesel fuel has more carbon content than petrol. If more diesel fuel is burnt, as is likely given its cheaper prices and rising number of cars and SUVs, the heat trapping carbon emissions will increase. Moreover, even the carbon soot from diesel vehicles are now implicated for global warming.

The region therefore needs to quicken the transition to meeting Euro V and VI emissions standards as quickly as possible.

ii. Mobility crisis hits the region

While vehicle technology and fuel quality are languishing the explosive increase in the personal vehicle numbers are threatening to undo the small gains from the first generation action in these cities. The biggest challenge that confronts the two cities and the countries is the rapidly increasing vehicles numbers that threatens to undo the small incremental gains. The growing congestion is crippling cities with other ugly manifestations.

- In Sri Lanka motor vehicle fleet has doubled in one decade (1991 to 2000) and the trend in recent years shows an even steeper growth. Colombo is facing the brunt. Delhi shares the same dilemma that already has 5.6 million vehicles and adding at least 1100 a day. Studies carried out in Sri Lanka have shown that the country incurs a massive financial and man-hour loss due to traffic congestion. Peak Hour journey speed in Colombo is steadily declining as in Delhi.
- Learn from Delhi's experience. Delhi has not been able to solve its problem of pollution and congestion by building more roads and flyovers for cars. Delhi is most privileged to have more than 21 per cent of its geographical area under road network. Delhi has built the maximum roads and flyovers. Yet its roads are totally gridlocked. Peak hour traffic has even slumped to below 15 km/hour. Cars and two-wheelers in Delhi occupy 90 per cent of the road space but meet less than 20 per cent of the travel demand. More roads are not the answer.

iii. First generation action in Delhi and Colombo has delivered. But not enough

Both Delhi and Colombo like other cities in the region have initiated action to deal with the problem of air pollution and even shown results.

- Colombo has already initiated its first generation action to clean up its air that includes a wide gamut of measures. These include – introduction of Euro emissions standards, mandatory annual vehicle emission testing programme that was launched in 2008, banned import of two-stroke engines; initiated conversion of 3-wheelers to LPG/ electric; constructing refinery that can produce Euro IV diesel by 2012 and plans to introduce Euro 4 in 2012 and so on. All these measures together has stabilised PM10 levels in Colombo. This gives the immense confidence for the future action -- if we act we will see results.
- Similarly, Delhi's first generation action also includes improvement in emissions standards to Euro III/IV levels, implementation of CNG programme, strengthening of the in-use vehicle programme, relocation of industries, etc. Initially these interventions helped to stabilize the problem and also helped to save more than 3500 premature deaths a year. But phenomenal increase in vehicle numbers has negated these gains.

Both Colombo and Delhi face the same dilemma of the mega cities. First generation action may have helped to stabilize or even lower particulate levels. But now levels are going up once again as in Delhi, and even newer pollutants are now emerging as the problem. In both cities nitrogen oxide levels are increasing steadily. In Delhi even ozone is emerging as a serious problem. These cities now face the second generation challenge. South Asian cities will have to leap ahead to keep ahead of the problem.

Our cities can avert the mobility and pollution crisis

Both Colombo and Delhi need urgent policies to protect and build on their strength. Their strength lies on the current usage of public transport and trips on non-motorised wheels and foot. Cities can not delay transportation plan to promote public transport, walking and cycling and allow dependence on personal vehicles to grow. Otherwise our cities will see more smog and pollution; more wheeze and asthma and more energy guzzling.

- Understand Colombo's strength. Public transport buses form less than 10% of the vehicles kms but they carry 60% of the passenger km. This means they use much less road space but meet significant share of travel need of the city. But private vehicles – cars and two-wheeler dominate vehicles km in the city at 60%, and occupy more road space, but carry just about 25 per cent of the passenger Km – a lot less than bus. If Colombo scales up alternatives it can easily make the transition to the low polluting and low carbon mobility paradigm that the world is trying to achieve today to be more sustainable. Colombo must recognize and build on this strength.

Colombo urgently needs a public transport strategy. A study carried out by the Asian Development Bank for Colombo has shown that an increase in bus ridership share from 76% to 80% can save 104,720 tonnes of oil equivalent, or 3% of the fuel consumed in the baseline case. This means 5% reduction in total vehicles and freeing up of road space equivalent to removing 62,152 cars. This can also lead to 5% reduction in total vehicles (47,716), release road space (equivalent to removing 62,152 cars from the road). This represents an enormous benefit.

- Learn from Delhi. Colombo must not repeat Delhi's mistake. Delhi still has high usage of bus, walk and non-motorised trips, but car centric policy is steadily marginalising and edging out the bus and non-motorised trips. Already within a decade bus ridership in Delhi has dropped from significantly from 60 per cent in 2000 to 40 per cent now. Delhi is now under immense pressure to reverse this trend. The Delhi master Plan has now set the target of 80 per cent of public transport ridership by 2020. Only such stringent targets and aggressive action can have the potential to check the slide.

Colombo still has the chance to plan its future growth differently and avoid the path of pollution, congestion and energy guzzling. Design roads for public transport, cycling and walking. Not cars. This is the option for the city to cut killer pollution, crippling congestion, expensive oil guzzling and global warming impacts of vehicles.

Control fuel guzzling

The cities in South Asia will also have to curb the energy impact of motorization. The rapid motorization can threaten energy security in the region. Not only the car numbers increasing in the cities of South Asia the markets are also shifting steadily towards bigger cars. While in the Indian car market the big cars form 36 per cent of the new car sales, in Colombo cars are predominantly big partly aided by the import of used cars and cheap diesel fuel. This can seriously threaten energy security. Sri Lanka already imports 85% of its energy demand. CO₂ emissions from the transport sector dominate the CO₂ inventory in the country at 45%.

Sri Lanka uses its tax policy innovatively to discourage bigger cars. There is significant difference in taxes on small and big cars.

South Asian cities immediately need fuel efficiency regulations and fuel saving measures to conserve fuel in the transportation sector and strengthen energy security. India needs to set and enforce the fuel economy standards. Colombo also needs to link its car import policies with fuel economy benchmark and a labeling programme.

The way ahead

Colombo's and Delhi's first generation action shows that it can make a difference. It is time to set new terms of action. Soft options have all been exhausted in South Asia.

More aggressive decisions -- reducing personal vehicle usage, upgrading public transport, walking and cycling, leapfrogging vehicle technology and fuel quality, and getting clean diesel are the key

options left for us. Let us quickly move to clean benchmark for vehicle technology and fuel quality, especially diesel. Also plan cities for people not vehicles.

- Immediately set the emissions standards roadmap for vehicle technology and fuel quality and set the timeline for the introduction of Euro V/VI emissions standards. .
- Continue to strengthen the LPG and electric vehicle programme to leapfrog to cleaner emissions. Set stringent inspection and safety regulations for the LPG vehicles.
- Scale up and accelerate bus transport reforms. Integrate public transport, and non-motorised transport. Cities need to integrate bus, cycling, walking and para-transit systems.
- Build pedestrian infrastructure: Design pedestrian guidelines for approval of road projects and enhancement of the existing ones. Without proper walking facilities public transport usage cannot increase.
- Introduce a parking policy to reduce congestion.
- Strengthen emissions checks on in-use vehicles.
- Use tax measures to discourage personal vehicle usage and inefficient use of fuels
- Introduce energy saving regulations and fuel economy regulations for vehicles.
- Enforce clean air standards