FOCUS E

Subcontinent at Nuclear Peril

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As India and Pakistan accelerate their hunt for acquiring new weapons of mass destruction and aim towards each other, the entire edifice of security environment of South Asia would be in quandary unless otherwise the peripheral countries take the changing security environment into consideration and reassess the national security perception.

n the year 1974, maybe coincidentally but Aparadoxically on the auspicious day of Lord Buddha's birth, Mrs. Indira Gandhi, late prime minister of India surprised the world by exploding India's first nuclear device at Pokhran and heralded her country's dangerous journey on the nuclear path.

Perhaps she materialised what her father, first Prime Minister of independent India. Mr Jawaharlal Nehru dreamt of. When asked about the intention of the explosion, Mrs Indira Gandhi stated it to be the use of nuclear technology for peaceful purposes. But the context changed when she was reelected in 1980 in which she amended her earlier stand and said "India would not hesitate about carrying out nuclear explosion...or whatever is necessary in the national interest." India's nuclear programme worked as a catalyst in the subcontinent as far as introduction of nuclear factor and proliferation is concerned, in a region where the situation remains extremely volatile to date due to inter-state rivalry and ethnoreligious strife.

Though India used and continues using the China card to justify her nuclear programme yet its 1974 N-test sent a shock wave to arch rival Pakistan. which was till then licking the wound from its humiliating defeat in 1971 at the hand of India. The then flambovant Prime Minister of Pakistan Zulfiquar Ali Bhutto openly vowed to bring Pakistan at parity with India by acquiring weapon grade nuclear technology. He is on record as saying that. Pakistan would eat grass if need be but would acquire nuclear technology to safeguard national security. Thus the world saw initiation of nuclear proliferation in one of the poorest region, particularly between two of the poorest coun-

tries of the world. The big powers including USA, hardly took any tangible steps to restrain these two countries from treading this dangerous path of nuclear weapons except that of occasional rhetoric on Pakistan's nuclear programme which could not deter Pakistan's quest to achieve parity with her arch rival. Surprisingly, during all this period

other countries of the subcontinent including Bangladesh, remained unmoved. Hardly any open concern was strongly voiced by these countries even at regular summits of SAARC or other regional meetings.

Ever since both India and Pakistan had openly demonstrated their nuclear prowess, few months back by exploding nuclear devices and testing long-range missiles, capable of carrying strategic nuclear warhead, the entire world has now focused their attention towards the subcontinent. India went a step ahead by declaring its "nuclear doctrine", making her intentions clear to arm its forces with both tactical and strategic nuclear weapon. To justify the formulation and adoption of the doctrine, India again played its China card, though months back India and Pakistan had fought a fierce battle in Kashmir's border re-

It is highly likely that Pakistan will follow suit to declare her adopted doctrine any day from now. Reportedly Pakistan is closely analyzing the implication of the doctrine that India has adopted. There is no doubt that soon Pakistan would announce its adopted doctrine and retain the option of arming her forces with nuclear weapons both at strategic and tactical level. The point to note here is that both India and Pakistan have tested the strategic delivery system and are reportedly beefing up the existing tactical nuclear weapons delivery sys-

The fast changing security environment is bound to alter the security perception of the smaller countries that are in the region, especially in the case of Bangladesh which is the second largest country in the region in terms of population, surrounded by India almost on three sides with Bay of Bengal in the south which is also dominated by India. Among other countries, Bhutan and Nepal are totally dependent on India for their access to the sea. Hence it is time to ponder the consequential effect of the new equation on the other regional countries especially on Bangladesh and on her security perception.

In the above context, we would briefly discuss the new factor in our geo-strategic security dimension as the result of nuclear proliferation in the sub-continent, especially that of India's nuclear doctrine, as we share a long common land boundary and Bay of Bengal in the south. Our geographical location puts India into geostrategic constraints in regard to the shortest and alternative route to the eastern parts of In-

As discussed earlier, India played the China card from the very beginning of the initiation of the nuclear programme and had been declining to sign any kind of international treaties restricting nuclear activities unless China also agreed to do so. In the threat perception, China figures on the top though after the 1962 Sino-Indian conflict, India fought two wars with Pakistan and the relation between the two has been worsening ever since the recent Kargil crisis. Recently India's ebullient Defense Minister and a renowned anti-nuclear campaigner, Mr. George Fernandez did not hesitate terming China as enemy number one, soon after India's latest nuclear explosion, though at a later stage he qualified his statement by altering his earlier stand and termed China to be the perceived enemy. This was a bid to justify to the world the perceived threat and need to achieve nuclear parity with China, which is reflected in India's declared nuclear doctrine.

Be that as it may, the fact remains that the Sino-Indian tangle will not remain confined to verbal rhetoric only but soon we would witness preponderance of India's nuclear deterrent more against China than Pakistan and Indian quest to be in parity with Chinese nuclear arsenal. India claims, China has massed nuclear weapon in Tibet against mainland India and as such the China factor has been equivocally pronounced as a preamble to the Indian nuclear doctrine, which envisages (1) no first use, (2) use

of nuclear weapon when at-tacked by other nuclear weaponstates or states that militarily aligned with a nuclear weapon state, (3) maintaining minimum nuclear deterrence as needed, (4) not using nuclear weapon against non-nuclear state (exact language of the doctrine is not used).

As initial reaction to the nuclear doctrine, USA dismissed India's China card and reacted sharply. In a press briefing, the US State department spokesman, Mr. James P Rubin said "There is nothing new about China having nuclear weapons. They have them for long, long time that I was born." He expressed with concern that nuclear weapon would not contribute to the greater security in South Asia, as claimed by India. The doctrine further amplifies that the nuclear deterrent would be based on aircraft, ship, mobile land based missiles and a "flexible and responsive command-and-control structure." What it implies is that, India would go ahead arming her three services with tactical nuclear weapons and resort to restructuring its strategic nuclear forces.

integrating it within her territory, India took the mantle of championing the Tibet cause and provided shelter to thousands of Tibetan refugees including Tibet's spiritual leader, Dalai Lama. China did not take this act as a friendly gesture. In fact, India is rather skeptical losing Tibet as buffer against communist China's southward thrust than championing the cause of Tibet's freedom. Tibet was a traditional buffer between imperialist China and British India as was other south Himalayan royalties like Bhutan, Nepal and Sikkim. China revived its old territorial claim up to north of Brahmaputra i.e., entire Arunachal Pradesh in the east and Laddak, area in the western India.

Since China's annexation of

Tibet on 7 October 1950, and

The largest area that was and is still being claimed to be a part of Chinese territory and remains a bone of contention between the two countries, lies adjacent to our north-eastern border, geographically connected with the rest of India. through a 28 mile wide land strip flanked by Nepal and Bangladesh known as Siliguri corridor. The corridor is within Chinese military capabilities of constant observation and indirect intervention if situation so develops. India has realized the strategic constraints of her only air and ground corridor to maintain a long tail of military logistics having the bases in the western parts of India, during the 1962 Sino-Indian war. In quest of an alternative logistical route, specially during a conflict situation, the geographic constraint has forced India to open a dialogue to ne-gotiate with Bangladesh for a safe passage, be it known as transit or transhipment. The strategic and commercial significance of the transit through Bangladesh was realized by India when China threatened to cut off Indian line of communication with the pre-emptive attack and capture of Indian territory in Bomdila region of then NEFA (North East Frontier Agency), adjacent to eastern border of Bhutan. The issue of strategically important transit remains in the priority list of India ever since she supported the Bangladesh movement in 1971. This fact has been amply brought out by many eminent Indian political, military writer and analyst. Few among them are Lt Gen JFR Jacob, who was then Chief of Staff of Indi-

Lt Gen JFR Jacob in his book Surrender at Dhaka, Birth of a Nation", writes about the issue of transit, "I last met with

a's Eastern Command during

1971 and by Mr. J N Dixit, now

a member of India's National

Security Council, first chief of

Indian mission in Dhaka, after

liberation of Bangladesh.

Dhar(DP Dhar) a few days after surrender, at VIP lounge of Calcutta airport: I suggested to Dhar that it was important to get from Bangladesh government an agreement on what consider to be three essentials: guarantees for the Hindu minority, rationalization of the enclaves, transit rights by rail and inland waterways through Bangladesh with use of facilities at Chittagong. DP (Dhar) with his charming smile. turned around and said . Jack, you are a soldier. These problems are political. They can be sorted out at the appropriate time. I replied that the appropriate time was now and it would be very difficult later to

obtain any agreement. He smiled again" (page 98-99). Mr. J N Dixit in his recent published book "Liberation and Beyond: Indo-Bangladesh Relations" writes about how Pakistants wanted to put the strategic use of the Siliguri corridor to their advantage and this was one of the strategic consideration of India to help Bangladesh gain independence (page 56-57). In the same book he also writes that in 1974, after the visit to India by Bangabandhu Sheikh Mujibur Rahman, in the joint declaration which included few bilateral agreements, transit was also discussed but Sk. Mujib did not straightway agree to the proposal, rather agreed to study the proposal. The Draft reads, "An agreement was reached to carry out a feasibility study for a rail link between Calcutta and Agartala via Chandpur and Akhnoor (perhaps Akhaura) in Bangladesh". Mr. Dixit continues in his book in the overview chapter, where he repeats, "Bangladesh is averse to giving India transit facilities through its territories to the north-eastern states of India. Bangladesh's also reticent about opening up the Chittagong port as a transit point for India.

However, my aim here is not to be involved in the ongoing

debate on whether transit/transshipment facilities should be provided to India, or not, but to make a mention that the issue is very important to India as far as her national interest is concerned. In view of the changing strategic scenario with the introduction of nuclear factor, our decision, makers should take into account our geo-strategic location in relation to the perceived Sino-Indian tangle and the new dimension added to it by India's nuclear doctrine. We as a smaller and relatively railitarily weaker country, should weigh the new equation that is emerging with the introduction of nuclear arsenal in the South Asian region. We should keep our options open in regards to our national security in the changing vista of the subconti-

India's nuclear doctrine

manifests sea-based nuclear deterrence which means adding surface ships and submarines capable of carrying and launching sea based strategic ballistic missiles, within the Navy. Use of Bay of Bengal for launching such weapon against China cannot be ruled out in a nuclear conflict scenario involving China. In such an eventuality we have to adopt ways and means to avoid creating even the remotest possibility of getting indirectly involved. The point to note here is that, China is reportedly constructing a deep sea naval facility to be shared with Myanmar off the coast of Akyab and developing the old Hump Route connecting south China with Yangon, as was used during Second World War by allied forces. These new facilities shall provide China with much needed surveillance opportunity of the Bay and the Indian Ocean and also provide with the shortest route to Southern China and Tibet. Increasing Chinese presence within the vicinity of India's sphere of influence, would compel India to enhance the Naval activity within the area to counter the perceived threat.

As India formulated and declared the nuclear doctrine keeping in view the alleged Chinese nuclear deployment in southern China, which is deemed to have been threatening India's national security, India would, in all eventuality,

deploy her land and sea based "minimum nuclear deterrent" to counter Chinese threat mainly in north-eastern part of India. This, however, would not preclude Bay of Bengal, In such a contingency, bordering countries like Bhutan, Nepal and Bangladesh would feel insecure.

Pakistan's nuclear programme is stemmed out of its threat perception and keeping parity with India and would continue to do so as the major dispute over Kashmir seems to be getting rather complex as year passes by without any sign of amicable settlement in near future. Pakistan's nuclear programme does not cause as much immediate concern for smaller countries bordering India's north and north-eastern periphery as does India's perceived deployment against China. But Pakistan's alleged clandestine operation in terms of subversive activities in India's troubled eastern states may turn the situation so explosive that it may put the security of smaller countries such as Nepal, Bhutan and Bangladesh in jeopardy. A case in point is the reported intrusion by Assam state police in Rajshahi in pursuit of Pakistan's ISI agent and recovery of explosives from within the ter-

ritory of Bangladesh. To sum up, for the sub-continent, plunged into ongoing inter state animosity in line of socio- political, geo-strategic and ethno-religious divide the added nuclear factor would imbalance the existing relations of smaller countries with the . neighboring newly emerged nuclear powers. As India and Pakistan accelerate their hunt for acquiring new weapons of mass destruction and aim towards each other, the entire edifice of security environment of South Asia would be in quandary unless otherwise the peripheral countries take the changing security environment into consideration and reassess the national security percep-

We, being one of the major countries surrounded by the second largest country in the world in terms of population and a newly emerged nuclear state, should be concerned of the new dimension added to the security perception in South Asia and reassess our stand

impact on improving air qual-

ity. Fuel composition partly

determines quality and quan-

tity of emissions from vehicles.

It is an offence for vehicles

to emit excessive smoke on the

road. Vehicles with smoky

emissions may be stopped by

the traffic police and BRTA offi-

for in-use diesel vehicles is 50

Hartidge Smoke Unit (HSU) us-

ing free acceleration test

method. Hartidge Smoke Metre

is to be deployed to various

points of Dhaka/Metro Cities to

conduct on-the-road spot check,

and penalties may also be im-

The smoke emission limit

Automobile Pollution

Contemplating Emission Control Measures

OLLUTION of atmosphere due to smoke emission I from automobiles is experienced as a long-standing problem throughout the world. particularly because of wide application and use of internal combustion fuel. Exhaust gases from the automobile engine contain unburnt fuel Hydro Carbon (HC), partly burnt fuel Carbon Monoxide (CO) and Nitrogen Oxide (NO), Sulpher Dioxide and Lead. These compounds pollute the air and many have a certain impact on humans and the environment.

Sixty per cent of pollution is caused by automobiles in the Metro Cities. The engine of vehicles emit pollutant exhaust smoke like hydrocarbon and Oxide of Nitrogen and Carbon Monoxide emitted from petrol used in motor vehicles. Carbon monoxide is colourless and odorless and stays in air for a considerable period than other gases before oxidizing.

The Suspended Particulate Matter, Inhalable Particulate Matter and heavy metals in the air available in the exhaust gas within 0.02 to 0.06 micron measuring range which are damaging the ecological balance due to incomplete combus-

There are many causes of smoky emission, but events leading to smoky emission can be broadly considered at two levels. The first level consists of human factors. By the actions and negligence of vehicle owners and drivers, they cause mechanical problems to develop in the engine. It is the engine factors which constitute the second level and this leads directly to smoky emission.

The most common human factors causing smoky emission in Bangladesh are: * poor maintenance.

* manipulation of engine set-

overloading of vehicles.

* poor driving habits. Poor maintenance of vehicles, especially older ones, is a primary cause of black smoke emission. When vehicular engines are poorly maintained, high wear and tear produces leakage in the combustion chamber, faults in the injection pump components and blockage of the air system. All these lead to incomplete combustion, resulting in black smoke produc-

Manipulation of engine settings is another common cause. This is a common practice amongst drivers and owners of larger vehicles such as lorries

and container trucks in which injection pumps of these diesel vehicles are adjusted to give a high fuel air ratio so as to increase the power of the engine, Such practice known as over fueling, causes the diesel fuel to be incompletely combusted and leads to black smoke emission. Overloading of vehicles oc-

curs mainly among goods carriers. It causes the engine to be over stressed because it is made to carry loads beyond what it is designed to carry. This results in higher wear and tear which in turn leads to smoky emis-

Poor driving habits such as 'dragging' the engine at low gear for prolonged period of time also produces higher wear and

The two main types of automotive engines used are the diesel and the petrol engine. Normally diesel engines are at higher risk of smoky emission than the petrol engine. The diesel engine is a compressionignition engine and it requires a large amount of oxygen for the complete combustion of diesel. Any wear and tear of the engine that causes insufficient air to be introduced into the system results in incomplete combustion of the fuel and this leads to black smoke emission. Diesel engines are found in vehicles that are more heavily loaded e.g. goods carriers and buses.

The nature of diesel fuel itself also increases the risk of the diesel engine to smoky emission. Diesel, unlike petrol is a heavier hydrocarbon. Its higher number of carbon atoms requires more oxygen for combustion. When incomplete combustion occurs, the carbon gets exhausted as black smoke or soot.

Sulpher is an impurity in diesel fuel. Its presence interferes with the combustion process and may lead to incomplete combustion in a poorly maintained engine. In addition, sulpher itself gets oxidised during the combustion process to form sulpher particulates which are an undesirable com-

ponent of vehicular emission. On the other hand, the petrol engine is less prone to smoky emission. However, the twostroke design which is commonly found in motor cycles and three wheelers are prone to white smoke emission. The design of two stroke petrol engine is such that with poor maintenance 'scavenging' of products of combustion becomes less efficient. Some of the petrol does not get combusted and is emit-

ted as a white smoke which comprises unburnt hydrocarbon. Old motorcycle and three wheelers are particularly prone to smoky emission. To compound the problem, lubricating oil which is added into the fuel tank together with the petrol in a two stroke design, has a different combustion characteristics from petrol and is often incompletely combusted. The smoke becomes more prominent when lubricating oil is overused. Under such circumstances, bluish smoke can be

Now we can discuss about Dhaka City. At present, Dhaka appears to be one of the most polluted cities as far as pollution concentration reaches 35 ppm due to automobiles. This figure runs at par with cities like Chicago, New York. The concentration of cars here is less in number and the main evil in this polluting activity is the hydrocarbon; 55 per cent of its comes from the exhaust, 25 per cent from the crank case and 20 per cent from the petrol

survey, during every 12 hours between 8.00 a.m. and 8.00 p.m. about 25000 nos. petrol and nearly 13000 nos. diesel vehicles ply in the Gulistan area of Dhaka emitting about 13 tons of gaseous substances. These include 82 per cent of carbon monoxide, 14.7 per cent hydrocarbon, 3.2 per cent nitrogen oxide, 0.05 per cent of ammonia and 0.11 per cent alde-hydes. The vehicles also discharge organic acids and most dangerously benzepyrene and carcinogen compound. At present about two lac motor vehicles ply in Dhaka Metro area. A survey reveals that 85 per cent of the vehicles emit smoke more than the recommended range.

level is about 45 decibles, it is much beyond in many parts of the city. Even in the silent zones like hospital and school areas, the noise level is in between 70 and 90 decibles and

and respiratory disorders, aggravation of existing respiraeases, alteration in the body's defence systems against foreign materials and damage to lung some of which are invisible,

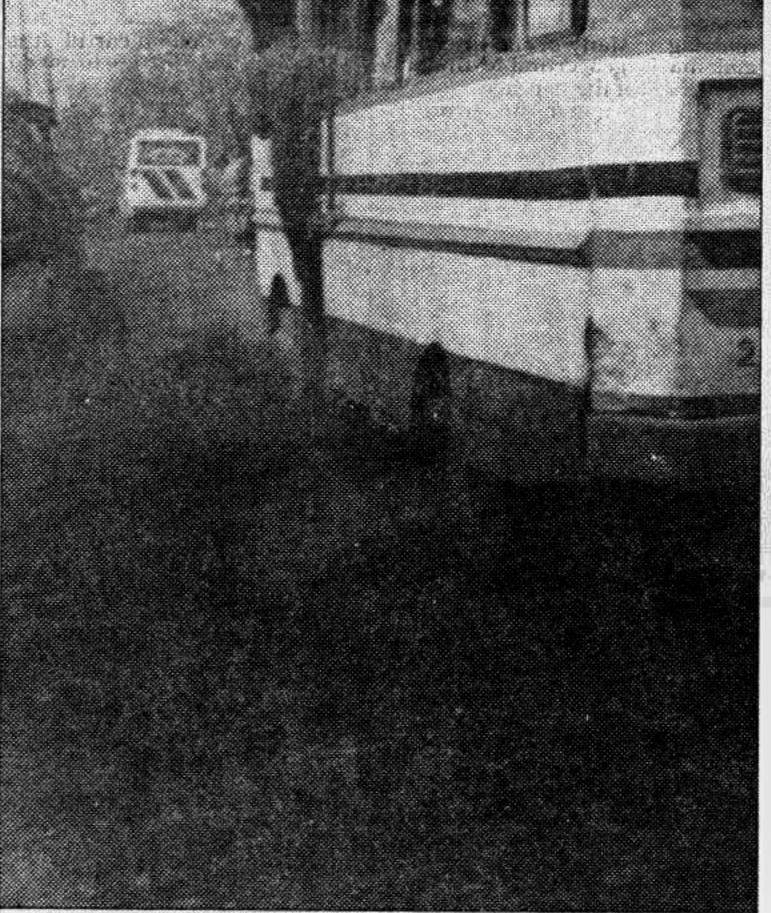
tank carburetor. According to an unofficial

While the acceptable noise somewhere even 120 decibels.

Health Effects

Health problems associated with inhalation of smoky vehicle emissions include breathing tory and cardiovascular distissues. The chief pollutants. comprise smoke particles, lead

by Md Zahangir Alam



carbon monoxide, sulpher dioxide and nitrogen dioxide.

From recent surveys conducted in our cities we know that presence of lead in the bodies of children is eight times the level permitted by the World Health Organisation. Every year 15000 deaths occur due to diseases related to air pollution. Lead is absorbed mainly as fine particles and affects many systems (central nervous. cardiovascular, endocrine, reproductive) in the body. Lead accumulates in blood, bones and soft tissues. Excessive exposure to lead may cause neurological impairments such as seizures, mental retardation and behavioural disorders. Experts believe that lead concentration in blood amongst residents of Dhaka must be higher than in any other city in Bangladesh or abroad and there is no provision to test the lead content of automobile exhaust. The leading chest specialists are saying that cases of asthma and bronchitis are increasing rapidly due to our air pollution and children are affected badly. Carbon monoxide enters the

bloodstream and reduces the delivery of oxygen to the body's organs and tissues. The health threat is most serious for those who suffer from cardiovascular diseases. Exposure to carbon monoxide is also associated with impairment of visual perception, work capacity, manual dexterity, learning ability and performance of complex tasks.

Sulpher dioxide can be absorbed of the nose and upper respiratory tract where it gives an irritant effect. Other health effects associated with exposure include impairment of respiratory function, alteration in the lung's defences and aggravation of existing respiratory and cardiovascular diseases. Sulphate particulate causes impairment of respiratory function.

Nitrogen dioxide is an irritant gas that is readily absorbed into the mucus of the respiratory tract. It can irritate the lungs, decrease lung function and lower resistance to respiratory function. Health effects vary from a mild inflammatory response to bronchitis and bronchopneumonia.

When exhaust sound and horn cross the tolerable level, it causes headache, emotional tension, cardiac disease, nervousness, high blood pressure and permanent damage of hearing. Noise pollution in Dhaka has already resulted in psychological disorders such as irritability, aggression and sadism, a higher propensity to crime. lack of efficiency and intellectual deficiency. In order to control/overcome the above situation the following measures may be adopted:

a. The government has to consider carefully before adding more road space to keep up with increasing vehicle population growth, bearing in mind the use of land for other needs such as housing. industries, parks and recreating areas. There is, therefore, a need to curb vehicle population growth to avoid also the serious traffic congestion.

Import of vehicles may be reduced and stiff duty and vehicle registration fees may be imposed on higher rate. c. To reduce air pollution from

vehicles is to introduce measures to curb individual vehicle emissions to pre-empt any deterioration in the air quality as a result of an increase in vehicle population. The strategy lies essentially in the use of improved fuel quality and engine design to ensure lesser amount of pollutants emitting from vehicles. Beside this, to reduce the poisonous exhaust gas emissions and sound pollution, all vehicles should be equipped with hot-air-injection system, exhaust gas recirculation and catalytic converters with sound control jackets and equipment. 'Catalytic Converters' can

convert harmful pollutants into harmless gases without entering into the chemical reaction while encouraging chemical reaction with each other. For example in HC/CO, catalytic converter encourages HC (hydrocarbon) to unite with Oxygen to produce H₂O (water) and CO (carbon monoxide) to C02 (Carbon Oxide). The catalytic in the NO splits the nitrogen from the oxygen.

We can use metal alloy adopter for near combustion by pre combustion fuel automisation process for which there will be no poisonous emission from automobile exhaust whatever may be the age of the vehicle, say, even 40 years.

As a respectable and responsible citizen, you can make every drop of petrol count. Yes, every one drop per second loss amounts to nearly 2000 litre per year. By using a complete combustion system you can save precious petrol/diesel to make oil resources last longer, reduce the foreign exchange drainage. At the same time you will get more mileage from the same fuel and the environment will be saved from the pollution to a great extent.

Ministries The Home/Communication/Environment may adopt the follow-

ing measures: a. Setting of emission stan-

posed instantly. Penalties for Smoky Emission

adopter/repaired.

a) 51-70 HSU b) 71-85 HSU

c) 86 and above

Smoke Level

Penalty Fines as per rules. Vehicles must be equipped with metal alloy adopter/repaired and sent for inspection within one month.

Fines as per rules. Vehicles must be equipped with metal alloy adopter/rectified. Owner and driver will be charged in Court Vehicles must be equipped with mental alloy

dards for type-approval to ensure that only low emission vehicles can be registered for use.

b. Improving fuel quality. smoky vehicles, and

c. On the road enforcement on Mandatory periodic inspec-

tion for in-use vehicles. e. Emission standards for vehicles registration to be strictly followed.

Encourage private sector/NGOs to introduce effi-

a. Petrol Driven Vehicles

cient technology to improve

wheelers known as baby taxis, major culprits for polluting the city air, can also be prosecuted. The enforcement of these vehicles are based on visual observation by police officers. Motor vehicles are to be inspected according to type and

Motor Cycles and three

age. It is mandatory once and in some cases twice a year. During the inspection, exhaust emission tests are to be

conducted. The following limits must not be exceeded during emission test:

b. Diesel Driven Vehicles

 $C0 \le 4.5\%$ by vol. (regd. > 86). $C0 \le 3.5\%$ by vol. (regd. > July ≤ .50 HSU.

 $C0 \le 60\%$ by vol. (regd. ≤ 1986).

 $C0 \le 4.5\%$ by vol. c. Motorcycles/Baby taxi

air quality with better vehi-

g Take initiatives for marketing improved lubricants and

unleaded fuel and efficiently monitoring their quality delivery system — specially the petrol pumps which allegedly mix kerosene or some other low cost oil with vehicular fuel.

Set up information network involving the stakeholders to increase knowledge and consciousness among the owners of the factories and automobiles. Cleaner fuels have a major

No vehicle's road tax will be renewed if it fails to get its emission tested.

Eventually, don't we feel that it is the right time to act collectively from the part of Govt, NGOs, private sectors and people at the grassroots level as well are to come forward to combat this ever increasing menace or else the days are not too far when we will have to pay the price for our next generation.

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