

**GOVERNMENT OF PAKISTAN
PAKISTAN ENVIRONMENTAL PROTECTION AGENCY
MINISTRY OF ENVIRONMENT**

WORKING PAPER

PAKISTAN CLEAN AIR PROGRAMME

P_{CAP}

AGENDA ITEM: PAKISTAN CLEAN AIR PROGRAMME

(PCAP)

The issue:

Air quality in urban centers has degraded to an alarming level over the past two decades due to increased consumption of fuel and poorly controlled emissions. The most serious and alarming issue is the presence of high particulate matters in air. In the urban areas, the major sources of fine particulate pollution are vehicles, combustion of fossil fuels in factories and the transboundary pollution from deserts and neighboring countries. The problem is aggravated by an aging fleet of vehicles in poor mechanical condition and low levels of fuel efficiency. Over the past decade, the number of diesel trucks and vans in major cities have increased creating an additional source of pollution¹.

2. According to Oil Companies Advisory Committee (OCAC), the consumption of Pakistan petroleum products during the fiscal year from July to March 2008 rose by 10.45 percent. Following this surge in petroleum products' consumption, it stood at 13.85 million tons during the first 9 months of the current fiscal year. Petrol and high-speed diesel consumption increased by 30.5% and 14.5% respectively, which pushed up petrol consumption to 1.89 million tons and high-speed diesel to 5.968 million tons. Kerosene consumption rising by 7.5% recorded at 0.169 million tons and furnace oil increasing by 5.7% at 5.7 million tons. On the other hand, JP-1 consumption dwindled by 12.6% stood at 0.519 million tons and light diesel fell by 8% remained at 0.1 million tons².

3. A study conducted by Pakistan EPA with the assistance of JICA in five cities (Lahore, Faisalabad, Gujranwala, Rawalpindi and Islamabad) revealed that the inhaleable suspended particulate matter in the ambient air reached to 6-7 time higher than the WHO acceptable limits. The study also established that 40% effect of suspended particulate matters was due to vehicular emissions while the rest was due to industry and natural sources.

4. The mean annual estimated cost of environmental and natural resource damage is about 365 billion Rs. per year or 6 percent of GDP. Cost of indoor air pollution is about Rs. 67 billion, whereas, urban air pollution adds another Rs. 65 billion. Urban air particulate pollution is estimated to cause around 22,000 premature deaths among adults and 700 deaths among young children. The total health costs are between Rs. 62-65 billion, or approximately 1 percent of GDP¹.

5. Due to presence of high suspended particulate matter in air, respiratory diseases, throat irritation, eye sore etc. are very common. Air pollution, which leads to formation of haze and dense fog not only affects public health but also has immense impact on national economy due to flight cancellation, slow traffic and less tourism. A study carried out by the Punjab University confirmed lower yield of crop (rice and wheat) in the polluted environment.

6. Pakistan Environmental Protection Council (PEPC) in February 2001 approved a National Environmental Action Plan (NEAP) for the country, which identified clean air as one of the core program. To successfully achieve objectives, administrative, legal and technical measures are to be taken besides initiating pollution control projects.

1. Strategic Country Environmental Assessment, The World Bank, 2006.

2. <http://www.geo.tv/4-12-2008/16677.htm>

State of Environment:

7. The major sources of air pollution that need to be addressed are:-

- **Emission from vehicles**
- **Emission from industry**
- **Burning of solid waste**
- **Natural dust / transboundary pollution**

a. Emission from Vehicles

Experts consider that 60-70% cause of urban air quality degradation is the vehicles exhaust. Vehicles population has shown a sharp increase over the past few years due to liberal leasing facility by the banks. Detail of percentage increase in the growth of manufacturing of automobiles in year 2006-07 is given below:

Table 1: Growth in the Manufacturing of Vehicles in Year 2006-07

Type of Vehicle	Percent increase
Jeeps and Cars	3.0
Light Commercial Vehicles	17.04
Motorcycles / Scooters	12.30
Tractors	11.40

The detail of number of vehicles on road is given below:

Motor Vehicles on Road (000 Number)

Type of Vehicle	Year 2000-01	Year 2006-07	Percent Change
Motorcycle / Scooter	2218.90	4463.80	101
Cars	928.0	1682.20	81
Jeep	18.30	85.40	367
Wagon	93.80	169.10	80
Tractor	579.40	877.80	52
Buses	86.60	108.40	25
Cabs	79.80	119.10	49
Rickshaws	72.40	79.00	9
D. Vans	72.40	148.90	106
Trucks	132.30	173.30	31
Pickups	68.40	104.50	53
Ambulance	1.70	4.60	171
Tankers (Oil)	7.20	7.80	8
Tanker (Water)	0.80	0.90	13
Others	89.0	38.50	- 57
Total	4471.00	8063.60	80

Source: Economic Survey of Pakistan 2007-2008

The above statistics show considerable growth of 2- strokes vehicles like motorcycles, rickshaws and delivery vans. Diesel driven buses and trucks have also increased significantly over time. According to study carried out by the World Bank in Bangladesh and in India, the 2-stroke vehicles are responsible for emission of very fine inhaleable particles that settled in lungs and cause respiratory diseases and heart attacks. Diesel driven trucks, buses and vans emit excessive visible smoke and poly aromatic hydrocarbons (PAHC) which is carcinogenic in nature. Emission of particulate matters, oxides of nitrogen, sulphur dioxide, and volatile organic compounds form haze.

b. Industrial Emissions

The industrial sector in Pakistan though is small in size if compared with other economic sectors, but it is rapidly expanding due to liberal government policy. Almost all metropolitan cities have its industrial estate where cluster of industries of different types exist. Majority of cement, fertilizer, sugar units, power plants and steel furnaces located in the vicinity of towns cause excessive air pollution. Bricks kilns are another source of pollution in many areas. Use of low-grade coal and old tires in brick kilns generate dense black smoke and other kind of emissions.

Consumption of Petroleum Products

Sector	Year 2000-01		Year 2006-07	
	Consumption (000) tons	% share	Consumption (000) tons	% share
Household	451	2.6	106	0.6
Industry	1924	10.9	15.96	9.5
Agriculture	255	1.4	97	0.6
Transport	8158	46.2	7982	47.4
Power	6488	36.8	6741	40
Other government	372	2.1	325	1.9
Total	17648	100	16847	100

The transport sector is the largest user of petroleum products accounting for 47.4% of consumption, however, its share has slightly decreased if compared to its share in 2000-01. This is because of switching over to cleaner fuels such as CNG. Share of power and industrial sector in overall consumption is 40 and 9.5 percent respectively.

c. Burning of Solid Waste

Pakistan generates 47,920 tones of solid waste per day, 19,190 tones in urban and 28,730 tones in rural areas. Since none of the city has proper waste disposal system, the waste collected is either dumped in the low lying areas or along the road sides and set on fire. Burning of solid waste at low temperature not only generate particulate matters but produce dioxin, a persistent organic pollutant.

The Federal Government has signed a Technical Cooperation in project with the Japanese Government for capacity building for solid waste management in the country. The purpose of the project is to strengthen the capacities of local government in formulation of community based solid waste management action plans, their implementation and evaluation according to the guidelines. The overall goal of the project is to attain a cleaner environment through improved solid waste management in different district of Pakistan. So far 25 concerned officers of municipal agencies have received training in Japan since 2005.

d. Natural Dust / Transboundary Pollution.

There is general aridity in the country with average annual rain fall ranging from 80-300 mm in the south to 1000-1600 mm in the north. Due to high temperature in summer (40-50C), fine dust rises up with the hot air and form “dust clouds” and haze over many cities of southern Punjab and upper Sindh. Dust storms are also generated from deserts (Thal, Cholistan and Thar) particularly in summer season and adversely affect air quality in the cities of Punjab and Sindh. Hydrocarbon having good affinity with dust particles form aerosols of inhaleable sizes which cause allergy and asthma.

Major Initiatives

Ministry of Environment in coordination with other ministries was able to achieve some objectives like introduction of unleaded gasoline in the country, reduction of sulphur (1% to 0.6%) from diesel oil, concessionary import duty on anti-pollution and recycling machinery, conversion of 1.7 million vehicles on CNG etc while many other initiatives are in the pipeline or yet to be taken.

The government is taking measure to implement Euro-II vehicular emission standards in Pakistan. In this regard, a number of meetings have been held with the stakeholders and it has been decided that Euro-II compliant diesel fuel will be introduced by the end of 2011. Introduction of Euro-II compliant petrol vehicles will be made by 1st July, 2009 and diesel vehicles by July of 2012.

Suggested Programme

Instead of a fragmented approach, the Ministry proposes a **Pakistan Clean Air Programme (PCAP)** which will incorporate ongoing, in pipeline activities and new initiatives **under the following sectors:-**

1. **Vehicles / Public Service Transport.**
2. **Industry**
3. **Agriculture.**
4. **Infrastructure/ Housing and Physical Planning.**
5. **Other Measures.**

The role of different ministries / **organizations** has been **specified** under three categories i.e short term, medium term and long term.

(1) VEHICLES / PUBLIC SERVICE TRANSPORT

Short-term Measures

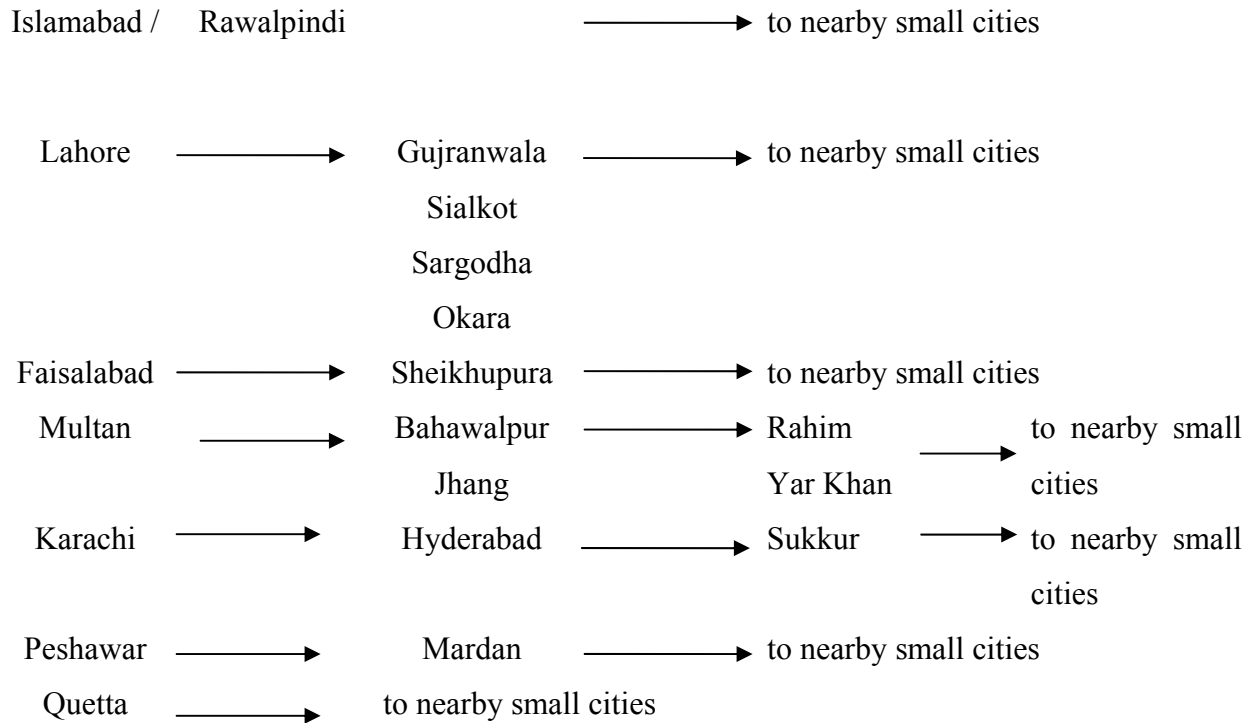
- i). Gradual exclusion of 2-strokes and diesel run vehicles from public service transport from urban centers. A plan has been presented below whereby the entry of public services 2-stroke and diesel run vehicles will be restricted in cities over a time scale, starting from the major cities and giving smoke lead time to medium and small size cities so that the targeted vehicles could be shifted to those cities where the bearing capacity of ambient air is enough to take pollution load. **(Federal and Provincial Governments).**

PLAN FOR PHASING OUT POLLUTING COMMERCIAL VEHICLES*

S. No.	City	Population (According to 1998 Census)	Banning 2- Stroke Rickshaws and Tri-wheelers. By End	Banning Entry of Public Service Non- Euro-II compliant Diesel Buses and Vans in Municipal limits. By End
Set of 1st Largest Cities				
1.	Karachi	9269265	2009	2012
2.	Lahore	5143495	2009	2012
3.	Faisalabad	2008861	2010	2013
4.	Rawalpindi	1409768	2009	2013
5.	Multan	1197384	2011	2013
Set of 2nd Largest Cities				
6.	Hyderabad	1166894	2012	2014
7.	Gujranwala	1042509	2011	2014
8.	Peshawar	988005	2009	2012
9.	Quetta	565137	2009	2012
10.	Islamabad	529180	2009	2012
Set of 3rd Largest Cities				
11.	Sargodha	553604	2011	2014
12.	Sialkot	421502	2011	2014
13.	Bahawalpur	408395	2011	2014
14.	Sukkur	335551	2013	2014
15.	Jhang	293366	2013	2014
Set of 4th Largest Cities				
16.	Sheikhupura	280263	2011	2014
17.	Larkana	270283	2014	2014
18.	Gujrat	251792	2011	2014
19.	Mardan	244511	2014	2014
20.	Rahim Yar Khan	233537	2014	2014
21.	Sahiwal	207388	2014	2014
22.	Okara	201815	2014	2015

- * 1. Fitness inspection shall be made compulsory for all private vehicles.
2. Production of 2-stroke vehicles of any sort shall be banned within five years.

Expected Shifting of 2-Stroke and diesel run public service vehicles



- ii. Establishment of Environmental Squad of Traffic Police in all major cities to control visible smoke. **(Provincial Governments).**
- iii. Stop import and local manufacturing of two strokes vehicles. **(Ministry of Commerce and Industry).**
- iv. Restriction on conversion of vehicles from, gasoline engine to second-hand diesel engines. **(Provincial Governments).**
- v. Launch effective awareness campaign against smoke emitting vehicles. **(Ministry of Environment and Provincial Governments).**
- vi. High pollution spots in cities may be identified and controlled through better traffic management. **(Provincial Governments).**
- vii. Regular checking of quality of fuel and lubricating oils sold in the market. **(Ministry of Petroleum and Natural Resources).**

Medium-term Measures

- i. Capacity building of Motor Vehicle Examiners. **(Pak-EPA and Provincial Governments).**
- ii. CNG driven buses will be given tariff preference. **(Ministry of Industries & Ministry of Finance).**
- iii. Establish vehicle inspection centers with public / private partnerships. **(Provincial Governments).**
- iv. Review Motor Vehicle Ordinance to provide for inspection of private vehicles. **(Federal and Provincial Governments).**

Long-term Measures

- i. Introduction of low sulphur diesel and furnace oil and promotion of alternate fuels in the country. **(Ministry of Petroleum and Natural Resources)**.
- ii. Identify pollution control devices and other technologies for vehicles and encourage their use. **(Ministry of Environment and Ministry of Petroleum and Natural Resources)**.

(2). INDUSTRY:

Short Term Measures

- i. Enforcement of NEQS **(Pak-EPA and Provincial EPAs)**
- ii. Introduction of SMART Program **(Pak-EPA and Provincial EPAs)**

Medium Term Measures

- i. Relocation of brick Kilns and adoption of alternate technology for brick manufacturing. **(Ministry of Environment)**
- ii. Introduction of industry specific standards. **(Pak-EPA)**
- iii. Implementation of Greening of Industry Program (25/75 Industrial Pollution Control) **(Pak-EPA and Provincial EPAs)**

Long Term Measures

- i. Promotion of waste minimization, waste exchange and pollution control technology in industry. **(Federal and Provincial EPAs, FPCCI, and M/o Industries and Production)**.

(3). AGRICULTURE:

Short Term Measures

- i. Optimum use of pesticides **(Ministry of Agriculture)**

Medium Term Measures

- i. Agricultural waste dumping and burning to be banned. **(Ministry of Agriculture)**

Long Term Measures

- i. Encouraging introduction of equipment/machines for collection / uprooting of post harvest residues as an alternate to burning. **(Ministry of Agriculture and Ministry of Industries)**.

(4). INFRASTRUCTURE / HOUSING AND PHYSICAL PLANNING

Short Term Measures

- i. Surveys and establishment of Indoor Air Quality Standards **(Pak-EPA, Provincial EPAs and Ministry of Health)**

Medium Term Measures

- i. Regulations on measures to be taken by builders including covering of builders/site during renovation and construction to avoid air pollution. **(Provincial Governments)**
- ii. Declaring park areas/green belts as protected area. **(Provincial Governments)**

Long Term Measures

- i. Shoulders along roads should be paved. **(Ministry of Communication and Provincial Governments)**
- ii. Promotion of ecohousing. **(Ministry of Housing and Works)**

(5). OTHER MEASURES:

Short Term Measures

- i. Creation of public awareness and education. **(Ministry of Environment and Provincial Environment Departments)**

Medium Term Measures

- i. Base line data collection on ambient air quality through diffusion techniques and using fixed and mobile laboratories. **(Provincial Governments)**
- ii. Improvement of energy efficiency in vehicles and industry. **(Ministry of Environment)**

Long Term Measures:

- i. Setting up continuous monitoring stations in cities to record pollution levels in ambient air. **(Ministry of Environment and Provincial Governments)**
- ii. Urban tree plantation, forestation in deserts and sand dune stabilization. **(Ministry of Environment and Provincial Forest Departments)**
- iii. Proper disposal of solid waste in cities. **(Capital Development Authority and Provincial Governments)**

Ministry of Environment will coordinate with concerned Federal and Provincial Governments to implement PCAP. The provinces may develop a “Green Fund” or activate the already created “Provincial Sustainable Development Fund” to achieve the objectives of the programme.

RECOMMENDATIONS:

Pakistan Clean Air Programme (PCAP) is placed before the council for consideration and approval.