

BRIEF OF ENVIRONMENTAL CONCERNS-PAKISTAN SCENARIO

Pakistan is a country of 131 million populations with per capita income of US \$ 488 and GDP of Rs. 6.821 trillion. The manufacturing sector contributed 17.9% to GDP and 15.3 % to GNP and showed a growth of 6.96 % in 1997-98. The maximum growth i.e. 8.4 % was seen in the medium scale industry.

The industrial sector consumes 16% of the total oil consumption (23.14 million TOE) and generates approx. 285 tonne CO, 162 tonne NO_x, 378 tonne SO_x and 4,400 tonne particulate matter. Little information is available on emission of non-conventional toxic pollutants such as cadmium, mercury, PCBs and other persistent organic pollutants, which have tendency of accumulation of human body.

The industry imported chemicals worth Rs. 4,600 million and dyes/colors worth Rs. 5,200 million during 1997-98 showing an increase of 400 % and 35 % respectively over the last ten years. About 525 types of chemicals are being imported in the country for use in different processing industries. Import data of 1997-98 indicates that industry imported 3,000 tonne of formic acid (a carcinogenic chemical), 2,052 tonne phenols, 4,200 tonne chromium salt and so on. There is also an exhaustive list of toxic chemicals which are being produced locally by industry in organized and un-organized sector. All these chemicals are entering into our environment every year. Their processing generate wastes and pose potential risk to public health.

A recent survey of 150 industrial units in five potentially toxic groups completed by EPAs in the three provinces, report extreme deviation from the levels prescribed in the National Environmental Quality Standards. Another survey carried out by Federal Environmental Protection Agency showed that tanneries located in Kasure and Sialkot are discharging effluent with chrome concentration ranging between 182-222 mg/litre against standards of 1 mg/litre and Chemical Oxygen demand ranging between 5002-7320 mg/litre Prescribed in the NEQS. A chromium salt producing unit near Rawalpindi is reportedly discharging chromium rich effluent in a water stream causing severe implications for residents of the adjacent areas. In such case, we have to differentiate between NEQS violation and environmental crime.

ETPI PROGRAMME:

Where we see many serious violations of environmental standards there some initiative on part of the industry are commendable. Advances have been made by the industry either collectively or individually. The Federation of Pakistan Chamber of Commerce and Industry set up an environmental cell and initiated Environment Technology Programme for Industry (ETPI) at a cost of Rs. 240 millions. This programme is Jointly funded by the Dutch Government and industry itself. Pakistan Tanners Associations has undertaken clean up of Korangi tanneries project at a cost of Rs. 35 million which included PTA/government contribution of Rs. 20 million. Kasure Tanneries project has also been initiated at a cost of Rs. 264 million in which Tanners Association is actively participating. A textile mill near Hub is investing Rs. 110 million on waste water treatment plant. One paper mill near Lahore has invested Rs. 15 million for treatment of their effluent. Besides we have many other examples where national and multi-national companies have made investments in installing pollution control technology and waste disposal incinerators.

ENVIRONMENT PROTECTION IN PAKISTAN:

The overall pace of environmental improvement in the industrial sector is quite sluggish. About 17 years have passed since the first 1983 Ordinance was promulgated and three year has lapsed since the new Environmental Protection Act has been in place. The initial 9 years period, since the 1983 Ordinance promulgated, was a vacuum in the environmental history of Pakistan. Neither the industry nor the Environmental Protection Agencies (EPAs) with their meager staff and resources could make any headway in controlling environmental degradation. In 1992, Pakistan attended the Earth Summit in Rio

de Janeiro and thereafter became party to various international conventions and protocols. This political commitment geared up environmental process in the country. The first meeting of the Environmental Protection Council held in May 1993 and the national environmental quality standards, inter alia, for industry were established. The Environment Division was converted into a full fledged Ministry and environmental institutions were somewhat strengthened. Mass awareness campaigns were launched to make the industry realized on environmental degradation and its implications. The industry which earlier thought environment a non-tariff barrier in their way of development, soon understood harmful effects of pollution and realized importance of environment in the international trade. The industry was repulsive and hesitant to discuss their environmental issues with the government but IUCN, SDPI, SUNGI, PILER and other non-governmental organizations stepped forward and form bridge between industry and government to bring them closer. Dialogues were opened with industry and as result of which the Ministry reviewed its policy of command and control to a policy of common sense approach. Thereafter, a new environmental law was agreed with the industry, NEQS were rationalized, modalities of enforcement of NEQS were worked out through consensus. Although this approach, on the one hand crated moral pressure on the industry to take remedial measures. To boost up their efforts, Industry expects credit on soft term basis and market based incentives.

A comprehensive legislation has been evolved over-time to prepare and implement national environmental policies. It is entitled as the Pakistan Environmental Protection Act, 1997 (PEPA' 1997). The PEPA'1997 was enacted repealing the PEPO'1983. The PEPA'1997 provides the framework for implementation of National Conservation Strategy, establishment of Provincial Sustainable Development Funds, protection and conservation of species, wildlife, habitats and biodiversity, conservation of renewable resources, establishment of standards for the quality of the ambient air, water and land, establishment of Environmental Tribunals and appointment of Environmental Magistrates, Initial Environmental Examinations (IEE) and Environmental Impact Assessments (EIA), and promotion of public education and awareness of environmental issues through mass media.

In order to operationalize the PEPA' 97, the Pak-EPA under took development/ drafting of following guidelines and regulations:

- Monitoring and management of discharges and emissions
- Periodical reports, data or information
- Pollution charge
- Emergency contingency plans
- Handling and disposal of hazardous substances and wastes
- Installation of devices in, uses of fuels, maintenance and testing of motor vehicles and noise
- EIA/ IEE guidelines
- Guidelines for self-monitoring and reporting
- Certification of laboratories and research institution
- Establishment of noise standards
- Establishment of industry specific standards for 21 sectors
- Establishment of ambient air quality standards
- Mandatory inspection of private vehicles in Islamabad.

RECENT INITIATIVES TAKEN BY PAK-EPA:

The pilot phase of Self-Monitoring and Reporting Programme has been initiated for 50 industrial units. By introducing this system, the Government is placing a high level of trust in the industry to examine and evaluate environmental performance on its own, and to make the information on environmental parameters available to the EPAs. This concept has been introduced for the first time to give an opportunity to the industry to regulate itself, with minimum involvement of the enforcement agencies and draw up their Environment Improvement Plans.

The Self-Monitoring and Reporting System will make the country's industry owners and operators responsible for systematic monitoring and reporting of their environmental performance. By

implementing this system the government will in fact transfer the responsibility for examining and evaluating industry's performance to individual industry facilities. The reported data will also enable government agencies to assist industrial units in controlling their pollution levels.

The revised National Environmental Quality Standards were notified in the year 2000. These standards were revised to make them more industry specific. The revised standards stipulate the maximum allowable concentrations of municipal and industrial effluents into inland waters, sewage treatment and into sea.

The Government has notified Environmental Impact Assessment (EIA) regulations and Certification of Environmental Laboratories Regulations, 2000 under the Pakistan Environmental Protection Act (PEPA), 1997. Different rules of the PEPA, 1997 are also under review in the Law and Justice Division.

A National Profile of Chemical Management in Pakistan was prepared in line with the guidance document of the United Nations Institute for Training and Research (UNITAR) and Inter-governmental Forum on Chemicals Safety (IFCS)

Japan International Cooperation Agency (JICA) has started bilateral cooperation with the Government of Pakistan in the field of environmental protection. The objective is to strengthen the capacity of the environmental administration of EPA through technical cooperation of Japan in areas where it is feasible. JICA, under this technical assistance Programme has stationed a long-term expert in Pak-EPA. Pak-EPA with the assistance of JICA has completed investigation study of air and surface water quality in Lahore, Rawalpindi and Islamabad.

Under the ADB Regional Technical Assistance Project on Resettlement Policy and Practice, a draft National Resettlement Policy was prepared and discussed in the round table meetings. The National Resettlement Policy is to help avoid involuntary resettlement, to minimize population displacement, to compensate and assist people unavoidably displaced, to include the full cost of resettlement and compensation in the project costs and benefits and to ensure that no work may be initiated without first acquiring the lands and setting all claims of the affected communities.

Pakistan is one of the signatories to the Male Declaration on Control and Preparation of air Pollution and its Likely Transboundary Effects for South Asia. The member countries were agreed to implement the provisions of the Male Declaration in phases. In order to facilitate the implementation of the Male Declaration, Pakistan Environmental Protection Agency conducted the baseline study and the national action plan. The objective of the baseline study was to gather information on air pollution. It provides information on the current status of air pollution monitoring in Pakistan, emission sources and estimates, research programs on air pollution that are under way, and the national response to the air pollution issue. The aim of the national action plan is to carry out activities that fill any gaps in information or understanding of air pollution issues. It discusses the establishment of an air pollution monitoring network in five cities, a mechanism for maintaining an emissions inventory, tools for assessment of impacts of air pollution and an air pollution reporting mechanism for the public and other member states of Male Declaration.

Type of industries in Pakistan and their impact on environment:

In Pakistan the industrial sector comprises small, medium and large units with blend of new and old technology. Most of the industries are situated in urban Center near the population with out treatment and pollution control facilities. The major cities where industries are located are Karachi, Lahore, Faisalabad, Multan, Hyderabad, Peshawar, Gujrawala, Sailkot and Gujrat. The industrial states i.e Hatar, Gadoon, --- in the country. Unfortunately there is no centralized treatment facilities anywhere. Pakistan industrial sector is comprises the major sub-industrial sector i.e.

Textile
Sugar

Leather
Fertilizer/Agrochemical
Cement
Dairy
Food processing
Pharmaceutical
Oil/Ghee
Paper & Pulp
Dyes and Pigment
Polyester Fiber
Industrial Chemical
Sports Good
Garments

Major export oriented industries are textile, leather, carpets sport and surgical instrument that account 80% of the total export value i.e US \$ 10.0 billion.

Unplanned urbanization and industrial growth in selected area generally and in urban center particularly created huge environmental problems. Large quantities of industrial and sewage wastes find their way in to either the air or natural water bodies. All the big cities situated at the bank of rivers dump their liquid and solid industrial waste directly in to there water bodies. According to an estimate Karachi dump its 600 million-ton sewage daily in to the see. Lahore dump about 200 million ton liquid and 100 million ton solid waste into river ravi. The quality of water of river Meclem, Kohnor and other before entrance in city center are so good that after sedimentation the water of these rivers could be used for drinking and domestic purposes. When these rivers pass through the big cities the quality of water become so polluted that the water from these river could not be even used for agricultural purposes. Due to open dumping of industrial/municipal wastes, the underground quality of water near and in big cities is deteriorating with the passage of time. According to a survey water from 50% tube well in Islamabad, has shown +ve microbiological test of coliform & E. Coliform.

Considerable concentration of toxic metals was found in fish samples collected from coastal are of Karachi.

The quality of air in almost all the big cities about 50% time in the year remains unhealthy. The level of pollutants i.e PM, Ph, CO, THC is found many times higher than the guideline values set by WHO or US-EPA. Small industries in the urban centers are major source of our pollution. Small scrap meeting steel mills electroplating and metal galvanizing units are big sources of toxic metals emission. The concentration of Lead in the steels of I-9 & I-10 sector of Islamabad, where small steel furnaces are located, is as high as ---.

There is a great dearth of data on concentration of air pollutants in gases emitted by individual process industries, even though the information on ambient air quantity for different location is ambiguous. This is due to luck of proper air-quality monitoring equipment and lack of expertise and proper trained manpower with EPAs. A brief environmental impact of different industrial sector is as follows.

Tanneries
Textile (processing)
Sugar
Cement
Fertilizer/agrochemical
Pigments & Dyes (Sandoz, ICI, Dawood chemicals)
Polyester
Inorganic industrial chemicals.
Steel furnaces. HCl, NaOH, H₂SO₄.
Pharme ceuticale.
Vegetable oil/ Ghee 50 industries.

WHAT ARE ENVIRONMENTAL PROBLEMS –REGIONAL & GLOBAL ?

Environmental problems such as global climate change, ozone depletion, ocean and air pollution, and resource degradation--compounded by an expanding world population--respect no border and threaten the health and prosperity. All the missiles and artillery will not be able to protect our people from rising sea levels, poisoned air, or foods laced with pesticides.

Man can solve problems created by man. The environmental problems we face are not the result of natural forces or the hidden hand of chaos; they are caused by human beings. These problems can be solved if we work in partnership with governments, NGOs and businesses that share our commitment to a cleaner and healthier world.

Challenges for the Planet:

Between 1946 and 1996, dramatic political change, economic progress and technological breakthroughs combined to reshape the world.

At the end of World War II, the earth's population stood at two billion; now it is nearing six billion. It took hundreds of thousands of years to reach the two billion mark; only 50 years to triple it. This gargantuan rise in population has crowded the cities, overtaken green spaces and *created unprecedented demand for energy, food, and shelter.*

Seventy percent of the world's marine fish stocks are fully to over-exploited. The people of the world annually release 23 billion tons of carbon dioxide into the air, increasing the earth's temperature and threatening the health and habitat of animals, plants, and people. Estimates are that **we lose 70 species a day**, forever. And the rate of destruction and loss is accelerating.

No one country is responsible for these problems. Many nations have contributed to their causes, and they can be addressed effectively only if the nations of the world work together, adopting and implementing policies that are result-oriented.

Climate Change:

Global warming is a serious and growing threat, and most governments agree that more must be done to protect life and economies from its effects.

There is now broad consensus within the international scientific community that human activity is altering the Earth's climate system. The burning of coal, oil, and other fossil fuels is increasing substantially the concentration of heat-trapping gases such as carbon dioxide, methane, and nitrous oxide in our air. The earth's temperature and sea levels are rising as a result.

Right now, 23 billion tons of carbon dioxide are being released into the world's atmosphere each year. At this rate of fossil fuel consumption, the Intergovernmental Panel on Climate Change (IPCC), an international body made up 2,000 of the world's best climate scientists, predicts the planet's temperature will rise by 1.8 - 6.3 degrees Fahrenheit, and the seas will rise between 6 inches and 3 feet by 2100.

This amount of climate change will affect us all. The range of impacts is likely to include: threats to human health, including increases in heat-related deaths and illnesses, and in the incidence of infectious diseases; mounting damage to coastal homes, businesses, and habitat from rising sea levels; accelerated loss of animal and plant species; and a shift in agriculture and food production as temperature and precipitation patterns change. Many scientists also predict that climate change will lead to an increase in the frequency and intensity of floods, storms, and droughts.

Toxic Chemicals and Pesticides

The security of our water and air and the safety of our food are directly affected by the world's ability to balance the agricultural, medicinal and industrial benefits of pesticide and chemical use with their risks.

Thirty-five years ago, Rachel Carson in her seminal book, *Silent Spring*, first raised the alarm in America about the dangers of unchecked use of persistent organochlorine pesticides like DDT and chlordane.

Persistent organic pollutants (POPs) are capable of traveling thousands of miles from their source, often moving in a northerly direction. POPs can last for decades in the environment, where they accumulate in

the fatty tissue of animals and people. These substances include such notorious compounds as PCBs and DDT are still used.

Biological Diversity:

Scientists warn that a quarter of all species could be gone in fifty years. At present extinction rates, they estimate seventy different kinds of animal and plant life disappear every day, forever.

Rising consumption of animal and plant products, the rapid conversion of land to human uses, increased pollution and the spread of exotic species to non-native habitats are putting enormous stress on the world's flora and fauna.

The acceleration of this loss of life is occurring just as we are beginning to understand the value of maintaining biological diversity. Compounds and by-products derived from animals and plants from around the world contribute to the development of new medicines, pharmaceuticals, agricultural products, and food ingredients. There is no way to estimate the potential benefits that may come from millions of species yet to be studied, or yet to be discovered. And there is no way to estimate the health, economic and spiritual costs to our children who could inherit a world robbed of a drug to cure AIDS, stripped of a strain of disease-free wheat, or bereft of the wonder of such diverse creatures as tigers and sea turtles.

Forests:

"The leaves of the tree are for the healing of the nations."

The world's forests are disappearing at an unprecedented rate. Every year, forests four times the size of Switzerland are lost because of clearing and degradation. In the 1980s, an average of 38 million acres of tropical forest were destroyed each year; those trends have shown no signs of decreasing in this decade. Subsistence farming, unsustainable logging, unsound development of large-scale industrial projects, and national policies that distort markets and subsidize forest conversion to other uses are causing deforestation worldwide, from Cambodia to Colombia, from Cameroon to Western Canada and the Western United States.

The loss of forests has major implications for the world. Forests are home to 70 percent of all land-living animals and plants. They replenish the earth's atmosphere and provide the planet with fresh air by storing carbon and producing oxygen. They help filter pollution out of the water and protect against flooding, mudslides and erosion. Forests provide timber, medicines, food, and jobs.

Oceans:

"Life originated in the sea, and about eighty percent of it is still there."

The oceans, ravaged by pollution and overfishing, are in trouble. World fisheries are under unprecedented stress as competition for these finite resources increases. Pollution caused by the deliberate dumping of debris, chemical contaminants, agricultural and industrial runoffs, sewage, and vessel discharge has endangered marine life and habitats. Coral mining, blast fishing, the dumping of contaminated dredge material, and other human activities have destroyed or dramatically damaged ocean and coastal habitats and the wildlife they sustain.

The Food and Agriculture Organization of the United Nations estimates that 70 percent of the world's commercially important fish stocks are fully or over-exploited. Chronic overfishing has depleted Atlantic cod and halibut stocks and resulted in the loss of thousands of American jobs. Stocks of some large ocean fish--tunas, sharks, swordfish and marlin--have declined 60 - 90 percent in the last two decades. Every year, 27 million tons of fish, marine mammals, sharks, sea turtles, and seabirds, one third of the world's catch, are caught unintentionally and thrown back dead or dying into the ocean.

The United States organized and is working through the global London Dumping Convention to reduce ocean dumping of waste and contaminants and through the UN's International Maritime Organization to reduce vessel discharge.

Regional Challenges:

The environmental fates of nations are inextricably and intimately linked within a region.

Toxins in the Great Lakes threaten the health of Canadians and Americans. Sulfur belched from coal-burning plants in China creates acid rain in South Korea, North Korea and Japan. Water shortages add to the tension in the Middle East, where Syria's and Lebanon's control of Jordan River headwaters directly affects water supplies downriver in Jordan, Israel, and the West Bank and Gaza.

In addition to these regional challenges, many countries also face internal environmental problems. In China, energy demand will triple by 2010. In Mexico City, 25 percent of the children have symptoms of asthma and in some parts of the city, over half of the children under five suffer acute respiratory infections. In India, less than 10 percent of the nation's more than 3,000 cities and towns currently have adequate sewage collection and treatment facilities.

Water Resources:

Water is the indispensable resource. Whether used for drinking, irrigation, transportation, or energy, people must have it.

But in increasing numbers of countries and regions around the world, the demand for fresh water outstrips the supply, and the quality of that supply is rapidly declining.

From 1950 to 1993, the amount of irrigated land increased from approximately 250 million acres to approximately 600 million acres. This increase has put enormous pressure on aquifers, rivers, and other water sources. Erosion, pesticide contamination, and other agricultural run-off are polluting water sources at an unprecedented rate and threatening human health, biodiversity, and coastal resources. At the same time, population growth, particularly in the cities, has created major problems for water supply and treatment. Polluted water is a leading culprit in the increasing spread of a number of deadly diseases, including cholera.

Industrial Waste Water Pollution:

The level of industrial pollutants emitted is growing at a very rapid pace in Pakistan and the adverse health and productivity impacts are significant and worsening. Indiscriminate discharge of industrial waste water is causing serious environmental problems, among them contamination of groundwater, including water drawn for drinking, contamination of sea water, affecting aquatic life and drinking water ; and contamination of rivers, particularly in areas with low levels of mixing, such as harbors and estuaries. To address this issue number of steps has been take which includes introduction of self-monitoring and reporting system by the industry, establishment of combined treatment facilities in industrial areas and introduction of cleaner technologies.

Domestic Waste Water Pollution:

Waste water in Pakistan is often dumped into open drains, streams or ponds, shallow pits, or septic tanks connected to open drains (many leading out directly to agricultural land); less often it is dumped into sewers. Household refuse is also dumped into streams and drains, which over time have become overloaded. Only 80 percent of the urban and 45 percent of the rural population is estimated to have access to clean water in Pakistan, and migration to the cities is putting pressure on inadequate urban water and sanitation facilities. Pollution has led to the spread of water-related infections; more the 40 percent of the hospital beds in Pakistan are occupied by patients with water-related diseases. Efforts are underway for development of sewage treatment facilities for major urban centers. Projects are mature, however, there are delays due to resource constraints.

Air Quality:

"Clear the air! clean the sky! wash the wind!"

For more than a billion people who live in urban areas around the world, the air they breathe is harmful to their health. Over three-quarters of the world's 20 largest megacities regularly exceed the allowable limits for at least two harmful pollutants monitored by the World Health Organization. The effects can be serious. For example, sulfur dioxide affects human health and creates acid rain which can erode buildings, kill aquatic organisms, destroy croplands, and damage habitats. Nitrogen emissions in the presence of sunlight can create a form of oxygen toxic to humans and other living things. Excessive levels of lead can cause a host of health problems, even brain damage.

The rise in use of fossil fuels around the world--in cars, factories, and homes--has pumped millions of additional tons of these and other pollutants into the air. While countries are struggling to provide sufficient energy resources to power their economies, they must also set and enforce standards and regulations to protect air quality and human health.

Urban and Industrial Air Pollution:

Pakistan's air quality is deteriorating mainly due to inefficient burning of fuel; use of environment unfriendly fuels; and emissions from other industrial and non-industrial sources. High concentration of particulate matters and emission of automotive and non-automotive lead is of great concern for public health. High Blood Lead levels in school children and adults, increasing cases of asthma, lung diseases, allergy and high blood pressure are indications of pollution effects. A research conducted in USA revealed that PMIO of 10 ug/m^3 is associated with 1% increase in daily deaths and 1 to 3 % increase in other indicators (Source: Chemical Incident, Vol. 1, No. 4, Oct. 1996). Imagine that majority of our cities have 2-3 times higher PMIO concentration than the safe limit. Pollution levels have direct relations with health budget. A World Bank study revealed that people in Karachi alone have to spend Rs. 25 billion on health care for not keeping air quality in conformity with WHO recommended standards. It may be mentioned that EPAs, which are responsible for monitoring and enforcement, are poorly equipped in terms of both equipment and trained staff. Under such circumstances enforcement of regulations become ineffective. However, efforts are underway to enhance the capacity of EPAs both in terms of equipment, manpower and other resources.

Motor Vehicle Emissions:

Vehicle emissions represent the greatest source of air pollution in Pakistan, reflecting the rapid growth in vehicle use. Growth has been especially strong within the past decade. Motor vehicle emissions account for about 90 percent of total emissions of hydrocarbons (smog), Aldehydes, and carbon monoxide. Other emissions include lead, which can cause mental retardation in young children, sulfur dioxide (the precursor to acid rains) and nitrogen oxides. Following efforts are being taken to improve the situations:-

- Introduction of clean fuels (phasing out of lead from gasoline and low sulfur fuels)
- Introduction of alternate fuels like CNG in motor vehicles
- Establishment of electronic tune up stations in major urban centres
- Improvement of public system

Energy Resources:

"Energy will do anything that can be done in the world."

Energy drives economies. It lights the cities, powers the cars, heats the homes and runs the factories. As countries around the world continue to develop, world consumption of energy could double by the year 2030.

The choice of which energy sources to develop are forcing governments and the private sector to face a series of complex and interrelated problems that affect societies at all levels. Coal, while abundant, easily convertible and cheap, produces 1.3 times the carbon dioxide (a greenhouse gas that causes global warming) per unit of energy as oil, and 1.8 times that of natural gas. It also contains trace amounts of toxic chemicals, is usually high in acid rain-causing sulfur, and leaves a residue of soot and ash. Natural gas, a much more environmentally benign energy source, also brings with it attendant problems: leaks from natural gas pipelines add methane to the atmosphere, while liquid natural gas poses potential hazards during its transportation. Nuclear power is a potentially limitless energy source and generates neither carbon dioxide nor other greenhouse gases, but there are environmental and safety risks associated with plant operation (Chornobyl and Three Mile Island) and with transport and storage of radioactive wastes.

Oil, the most versatile energy source, also raises environmental and political concerns. The concentration of reserves in relatively few countries makes it a politically volatile commodity. The highways of the world are congested with polluting automobiles running on gasoline, an oil derivative. Disasters related to the transport of oil in the world's fleet of supertankers remain etched in the public's mind; while the deliberate torching of Kuwaiti oil wells provides a vivid picture of waste and environmental degradation.

The power sources of the future may be wind, solar energy and hydrogen fuel cells--but the technologies are not yet developed to allow for their cost-effective and widespread use.

Land Use:

"Each blade of grass has its spot on earth whence it draws its life, its strength; and so is man rooted to the land from which he draws his faith together with his life."

By 2020, the world will need to feed 8 billion people. New crop varieties, pesticides and irrigation continue to improve yields around the world. However, technological advances have not been enough to offset the need for additional croplands. And as the search for and use of arable lands intensifies, the amount of erosion, siltation, deforestation, and desertification will increase.

Many governments around the world are faced with very difficult decisions about land use. Local and national leaders must weigh the competing goals of protecting a forest against providing additional croplands. They must consider whether regulations and protective measures to preserve a cropland's long-term viability, such as limiting irrigation and restricting types of crops planted, place too much of an economic burden on their citizens by limiting crop yields in the short-term. They must evaluate whether to control certain types of land transactions--for example, selling arable land for commercial/urban use or to preserve it for agricultural production.

These decisions by governments have social, environmental, and economic implications, which in turn affect our foreign policy. To promote domestic and regional stability, the State Department is working bilaterally and regionally to help countries with land use issues.

In Central Asia, planners have diverted most of the fresh river waters that once flowed to the Aral Sea, to irrigate water-intensive cotton crops. Only 10 percent of that water now reaches the Aral. As a result, the Aral, once the fourth largest inland sea, has lost over half its surface area since 1960 and continues to shrink. The accompanying loss of the

commercial fishing industry, deterioration in water quality, contamination of the soil from salt blown hundreds of miles from the former sea bottom, and declining ground water levels have devastated a 400,000 square kilometer region. This summer, the State Department will open a Regional Environmental Hub in Tashkent to promote regional cooperation on water management in the Aral Sea basin.

Urban and Industrial Growth:

"We cannot afford merely to sit down and deplore the evils of city life as inevitable...We must set ourselves vigorously about the task of improving them--"

By the year 2000, it is estimated that--for the first time in history--half the world's population will live in cities. In developing countries, cities account for 70 percent of Gross Domestic Product (GDP). The rapid rate of urban and industrial growth has been a catalyst for tremendous economic dynamism in places like Asia and Latin America. But it also has serious environmental consequences. Most municipal and national governments lack the capacity to effectively treat sewage, dispose of solid waste, regulate air and noise pollution, or control sprawl. Most industries do not have pollution prevention technologies that can ensure clean production methods at affordable costs. As tens of millions of additional people are born in or migrate to urban and industrial areas, the magnitude of these problems multiplies exponentially.

Urban and industrial centers increasingly suffer from a proliferation of environmental health problems, including the re-emergence of many infectious diseases. As urban areas expand, arable land disappears, as do wetlands and forests, which filter water and air and provide flood protection. With many of the world's major cities located on or near the coast, pollution of the marine environment and the resulting damage to fisheries, coral reefs, and beaches is another major concern.

Engaging governments and the private sector in addressing the environmental effects of rapid urban and industrial growth is in America's interests: healthy and livable urban environments are key to long-term stability, social equity, and economic growth.

Population Growth and Poverty:

Pakistan's population growth rate is around 3% per annum. It has contributed to the degradation of the environment causing soil degradation, deforestation, rangeland degradation and many forms of urban and industrial pollution. In Pakistan around 30% population lies below the poverty line. Poverty and environmental degradation are closely connected. Pakistan Government has launched a massive program of Rs. 15 billion for poverty alleviation. Similarly poverty alleviation fund amounting to US \$ 100 million has been launched and establishment of micro credit bank is in offing.

Marine and Coastal Zone Pollution:

The coastal environment has changed over time, partly as a result of the massive take-off from the Indus River for irrigation and extensive pollution, particularly around the Karachi area. Most striking is the reduction in the mangrove forests, which has adversely affected fish and shellfish nurseries. For the most part, marine and coastal zone pollution Pakistan is limited to Karachi, a city of more 10 million people that accounts for about 45 percent of the country's industry. All the Karachi's industrial waste, effluents, and domestic sewage, and all of the agricultural run-off from the hinterland and the Indus River find their way, untreated, into the sea. The Ministry of Environment, Local Government and Rural Development in collaboration with National Institute of Oceanography has developed Pakistan's National Programme of Action under the Global programme of Action for the Protection of the Marine Environment from Land Based. Efforts are underway to mobilize resources to undertake the national programme of action. A high powered Marine Pollution Control Board under naval Chief has been set up to initiate various programs/projects to combat marine pollution problems. Karachi Port Qasim Authority are separately launching various schemes in this behalf.