

Urbanisation and Environmental Degradation in Pakistan

SHAMIM A. SAHIBZADA

I. INTRODUCTION

The concern over the environment is not new. But the development policy-makers have recently recognised that failing to take the costs of environmental damage into account will slow down the process of raising incomes and the well-being of the people. This recognition is in view of the fact that economic development in both industrialised and developing countries, especially during the past half century, has not been environmentally sustainable. The current debate regarding the environmental sustainability of economic development has even challenged the very question of development. The measurement of per capita income is no longer accepted as a sufficient indicator of people's well-being when it comes to the quality of life and its sustainability over time. The true growth rate in the Gross National Product (GNP) of a country will definitely be lower than the absolute rate if the depreciation of natural resources resulting from environmental degradation is allowed. The Indonesian growth rate of 7.1 percent in 1971-84 has been reported to be actually 4.0 percent when the depreciation of three resources i.e., petroleum, timber, and soil were taken into account [Warford and Partow (1989)].

In Pakistan the concern over the environment has increasingly been felt over the more recent years in view of the rapid rate at which the natural resources are being depleted as a consequence of development activities, growing population pressures, and the persistence of poverty. Our country seems to be faced with a dilemma since the issue of sustainable development is being raised at a critical time when there is an urgent need to increase the rate of economic growth because of the increasing population pressure. Important questions such as: is it possible that environmentally sustainable development could also lead to a greater alleviation of poverty? And would it result in a lower rate of economic growth and employment than is otherwise possible? Need to be answered. A crucial question to ask would be: should the country compromise its growth objectives in order to accommodate environmental objectives if there is a trade-off between the two? Again are there any

Shamim A. Sahibzada is Chief, Training/Project Evaluation Division at the Pakistan Institute of Development Economics, Islamabad.

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conflicts between policies to promote growth and preserve the environment. The answers to all these queries and questions demand a stock of relevant data and in-depth studies which, at the moment, are lacking.

Keeping in view the scarcity of the quantitative and qualitative information regarding the impact of environmentally hostile technologies, strategies and policies, any rigorous analysis, at the moment, appears to be quite an impossible task. Data constraints and the broadness of the subject requires to restrict the study to certain specific dimensions of the subject. The present study is thus restricted to the air and water pollution as a consequence of urbanisation in Pakistan. Also, this dimension is chosen in view of the Report of the World Commission (1987) which has named the current century as the Century of the Urban Revolution. The Report has projected that by the first quarter of the next century, over half of the population of the developing countries—about 4 billion—will be living in urban areas. Pakistan will also have a fair share in this explosion of urban population which has already increased from 7.6 million (22.5 percent of the total population) in 1961 to 23.8 million (28.3 percent of the total population) in 1981 [Government of Pakistan and UNICEF (1988)]. Karachi, Lahore, Faisalabad, Rawalpindi/Islamabad, Hyderabad, Multan and Gujranwala with 52 percent of the total urban population are the major cities confronted with environmental degradation which is the consequence of rapid urbanisation. While the rapid growth of urban areas has resulted in additional investments, the latter have not kept pace with the actual needs of the people thus putting enormous pressure on facilities such as the provision of water, electricity, sewerage, waste disposal and housing.

The study has four sections. The first section gives an introductory background to the environmental concerns felt all over the world. The second section focuses on the seriousness of environmental degradation in urban Pakistan. In the third section, an attempt is made to tackle the problem at the policy as well as at the project/programme level. The fourth and the last section discusses the conclusions of the study.

II. ENVIRONMENTAL DEGRADATION IN URBAN PAKISTAN

Environmental degradation in urban Pakistan may be discussed under the following three heads:

1. Industrialisation-related;
2. transport and Energy-related; and
3. poverty-related.

Industrialisation-related

Industries not only create jobs but also contribute to environmental degradation. In Pakistan, like other developing countries, industries are located in

the major urban centres and much of the industrial waste is disposed off untreated in rivers and canals. A few examples can show the extent of the damage caused by this source of pollution [Hanif (1992)].

Karachi, the biggest industrial site in Pakistan, is contributing significantly to pollution with highly toxic wastes being disposed off in the environment. The huge quantities of industrial waste water containing almost all types of pollutants, even those with lethal toxicity, are discharged into the coastal waters, thus putting the marine life to great pollutional stress. Another consequence is the migration of fish in large quantities to other parts of these waters resulting in a continuous decline in the fish catch, which is a potential source of foreign exchange earning for Pakistan. The health hazards caused by the polluted fish are added negative externalities.

The Kasur case of environmental degradation caused by the leather industry is worth mentioning since the entire ecology of the affected area has been devastated environmentally. Some recent studies by the Pakistan Council of Scientific and Industrial Research (PCSIR) have shown increased cases of lung cancer in the residents of the area.

The Deg Nallah near Lahore and the Chenab and the Kabul Rivers polluted by the discharge of untreated industrial wastes are also causing severe environmental problems.

Industries in the Peshawar Vale are polluting the Kabul River threatening its use for domestic and irrigation purposes as well as its fresh water fishery.

Industries in Faisalabad discharge high levels of solids, heavy metals, aromatic dyes, inorganic salts and organic materials directly into municipal sewers without any treatment, polluting agricultural lands. Discharges from the Pak-Arab Fertilizer Factory in Multan into a *katcha* channel have been reported to have caused livestock deaths and contaminated a large tract of cultivated land.

In Balochistan, the Hub Industrial and Trading Estate (HITE) is the focal point of industrialisation. Quetta has a number of small industries. Since none of these industries is regulated pollution may be assumed [Gils and Baig (1992)].

Transport and Energy-related

Vehicle emissions in urban areas of Pakistan are the major source of air pollution, particularly because of the use of leaded fuel. Motor vehicles account for 90 percent of the total emissions of hydrocarbons, aldehydes and carbon monoxide in cities and for three-fourths of the sulphur dioxide and nitrogen oxides emission. The average Pakistani vehicle emits 25 times as much carbon monoxide, 20 times as many hydrocarbons and 3.6 times as much nitrous oxides in grams per kilometre as the average vehicle in the United States [Qutub and Khan (1992)]. Studies in many countries [World Bank (1992)] have quantitatively linked air pollution with respiratory diseases including lung cancer, and with mental retardation. Estimates for Bangkok suggest that an average child loses four or more IQ points by the age

of seven because of the elevated exposure to lead. In Mexico City lead exposure is causing 20 percent of the incidence of hypertension.

The costs of pollution from energy are high and will increase rapidly if policies towards energy conservation are not implemented effectively. Pakistan is peculiar in that the country is energy deficient, the demand for energy being greater than its supply but also wasteful in utilising the energy that is produced. As pointed out by Quttub and Khan (1992), with the rise in energy prices, energy intensity has declined in other countries but it has increased by 13 percent in Pakistan. In fact, it is interesting to note that Pakistan consumes energy at the same rate per dollar GNP as the USA. This reflects Pakistan's non-economical use of energy.

Emissions from domestic energy consumption also imposed serious costs for health and productivity. The World Bank (1992) reveals that in the second half of the 1980s, about 1.3 billion people worldwide lived in urban areas that did not meet the standards for particulate matter (airborne dust and smoke) set by the World Health Organization (WHO). These people faced the threat of serious respiratory disorders and cancers. If, the Report says, emissions could be reduced so that the WHO standards were met everywhere, an estimated 300,000 to 700,000 lives could be saved each year.

Poverty-related

Poverty and environment are closely related. Not only does poverty lead to environmental degradation but the converse is also true. The most obvious example of how the urban poor contribute to environmental degradation is in the use of energy for household consumption. The urban poor use traditional sources such as wood, charcoal, crop and animal waste for 80 percent of their energy consumption. The urban poor are mostly housed in slums and *katchi abadis* which are, by definition, characterised by poor housing conditions and insufficient basic amenities such as drinking water, waste disposal, and sanitary systems. The percentage of the urban population living in these unserviced slums was about 25 percent in the mid-1980s and is expected to increase to 60 percent by the end of the century [Qutub (1983)].

Poverty-related pollution in the urban areas comes mostly from the informal sector which absorbs an increasing proportion of the urban labour force. Since this sector includes at least some activities that are polluting such as the use of energy for households consumption, as mentioned earlier, and emit chemical and other toxic substances hazardous to health, clearly these activities have an adverse effect on the urban environment besides endangering the lives of the workers themselves.

III. THE ROLE OF THE GOVERNMENT

Environmental damage and the market system co-exist in our society. The market system is largely concerned with the private costs and benefits of undertaking certain activities and is not socially efficient. Social efficiency will only

be achieved if social costs, i.e., private plus external costs are taken into account. But since markets in the actual world are imperfect, divergence between the private and social costs leads to the emergence of externalities. Environmental problems are externalities that fail to be accounted for in conventional analysis. Besides, certain assets, such as clean air or water, are not owned by any one. Since the market cannot solve problems by itself, hence government intervention becomes necessary. The government need to attack the problem both at the policy as well as at the project level.

At the Policy Level

Most government policy instruments fall broadly into two categories namely, "economic" or "market-based" instruments and "command and control" instruments [Eskeland and Jimenez (1992)].

In the past the regulatory or command approach to environmental policy has prevailed. With this approach the emphasis has been on centralised control, devolving from governmental bureaucracy. However, the growing interest in environmental policy that has been shown in recent years has brought economic instruments to the front. Economic instruments shift the effect of environmental impact directly to the economic agents responsible, e.g., farms, business, industry, government agencies or households. The way in which economic incentives can be employed to achieve environmental aims have been pioneered in recent decades. In practice, however, the use of economic instruments of environmental policy is not yet widespread. In spite of the increasing importance of these instruments the role of command solutions should not be overlooked, because regulation will continue to offer a broad range of advantages.

Many researchers have, though, shown that policy outcomes are influenced not so much by net gains to society as by who gains and who bears the burden of different strategies. If a group that prefers one instrument over another can influence policy decisions, it is likely that a policy will be chosen that does not minimise costs [Eskeland and Jimenez (1992)].

The following are the areas where Pakistan needs clear policies taking environmental concerns into account.

1. The first area for policy innovations pertain to industrialisation. Industries influence the urban environment partly through atmosphere and water pollution by virtue of the chemical, toxic or other substances they use. In order to reduce such pollution, the policy-makers can rely on national energy policies or on economic instruments mentioned earlier to contain pollution. The command or control approach can also be used. The "polluter-pays-principle" is relevant in improving the urban environment depending on the institutional capacities in our country for the enforcement of market-based instruments. This should be supported by a strong legal set up that is capable of bringing those who pollute to

book. Thus, the strengthening of legal institutions is necessary if government policy to control pollution is to succeed. Along with the legal aspects it is also important to educate people about the adverse effects of pollution. This can be achieved through mass media as well as by running training courses in this area. These training courses would have to be multi-disciplinary drawing on the expertise of engineers, economists, chemical technologists, etc.

2. The second area for policy measures is concerned with energy. There is need to develop the appropriate infrastructure as well as use fiscal instruments to bring about a shift in the pattern of energy consumption especially by the poor households. Community bio-gas plants to recycle organic waste and electricity derived from hydroelectric sources could play an important role. Besides, energy pricing is another area which needs the attention of the policy-makers.

Since much of the atmospheric pollution in Pakistan is caused by vehicles using leaded fuel, traffic congestion and obsolete vehicles that are inefficient in fuel use, there is an urgent need to review the transport systems and their efficiency with a view to finding solutions to the problems of the environment.

3. The third area is related to improving the physical environment in which the poor live. This calls for substantial investment in infrastructure, such as housing, roads, water supply, waste disposal mechanisms and so on. Improvement in the physical environment in which the urban poor live may not be sustained if the population-infrastructure balance deteriorates over time. To ensure that it becomes necessary to find ways to control population densities, investment in the social sectors also becomes essential.

At the Project Level

An important source of environmental degradation in Pakistan has been the negative side-effects of short-sighted development projects which managed to pass through all the stages of the project cycle without taking any notice of the environmental factor. The reason for the passage of such environmentally unfriendly projects has been the absence of any environmental requirement at the preparation and approval stages of the project cycle. The criterion by which a project's viability is judged asks only for technical, financial and economic profitability and no term such as the environment-weighted rate of return is known to development planners. A systematic Environmental Impact Assessment (EIA) of all options especially at the identification, preparation and appraisal stages of the project planning cycle is a critical need of the time.

Any EIA would require a detailed probe into all possible consequences, not only physical and biological but also into social consequences on human welfare, both at the present time and in future, near the site and elsewhere. In Pakistan, the

environmental impact assessment of projects is in its infancy [Noman (1991)]. Experience shows that only in the case of foreign-funded projects is the inclusion of Environmental Impact Statements (EIS) in the project formulation (PC-1) being asked for, even though the Pakistan Environmental Protection Ordinance (1983) requires every sponsor of an environment hostile project to submit this statement with the Environmental Protection Agency (EPA), at the planning stage of the project. This also has been a very recent phenomenon. One reason for not submitting this EIS may be the shortage of relevant expertise in the field. Another reason may be the difficulties of incorporating assessment results, which are often non-quantitative, into decision-making. One useful option could be to incorporate qualitatively the views of the local people into the project at the design stage [World Bank (1992)].

At the micro level of development projects, the choice of technology is one of the principal determinants of the socio-economic viability of the projects. This choice also largely influences the nature of the environmental impact of the projects. While decisions in regard to technology are taken in accordance with the pull and push of several politico-economic factors—such as conditions laid down by external financial sources and the national/local factors and resource endowments—it will be useful to let environmental factors also play a role in that decision. Thereby, the adverse environmental impact of projects can be minimised at the very start, thus negating the need to invest resources at a later stage to cope with the resultant environmental disabilities. The application of environmental criteria for the choice of technology will also provide an opportunity to use favourable environmental opportunities to maximise the use of local resources or to give preference to labour over capital-intensive techniques especially in capital-scarce developing countries. It is particularly necessary to promote pollution prevention technologies which are built into project design, instead of "add on" technologies which are introduced after the plants are installed. Built-in-technologies, if developed endogenously, are cheaper but it requires advance planning [Bhardway and Nadkarni (1992)].

IV. CONCLUSIONS

Environmental issues are attracting increasing international attention, although they still fail to have a major impact on economic policies in the developing countries. In part, this failure reflects the overwhelming drive for material progress, as measured by Gross National Product (GNP) growth rates. It also reflects a common failure to accept that slow-working negative environmental consequences will eventually prove disastrous. Moreover, the biases of cost-benefit analyses which give inadequate attention to negative externalities and to sustainable development reflect the short sightedness of policy-makers. On the other hand, even if environmental concerns are taken seriously, it is not easy to implement appropriate policies. Properly conducted cost-benefit analyses can identify socially desirable programmes/projects, but economic decision-makers may be constrained

to undertake this set of projects since the political pressures involved dominate the selection process.

Thus, the appropriate policies are bound to be interventionist, but the key questions are whether they should be direct or indirect and how fundamental a change of the economic system is required. Implementation may be a serious problem because of lack of strong institutions and also because of lack of political will and commitment. More importantly, the pattern of externalities may be such that the positive private return from an environmentally undesirable project accrues to the rich and powerful, while the negative externalities are borne by large numbers of poorer and less influential people.

To sum up the discussions as presented in this paper, three areas have been identified for government intervention at the policy and the project level. Two of these relate to the policy level and the third is to be tackled at the project level. At the policy level, the first step requires the development of the institutional and legal framework to implement effectively pollution control laws and ordinances. At the project level, there is need for developing skills to incorporate environmental aspects in the project evaluation techniques. Hence training in these areas is essential.

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**Comments on
"Urbanisation and Environmental Degradation
in Pakistan"**

1. Critique of the Review

The Review provides the following elements:

1. A description of the problem;
2. an overview of policy changes needed; and
3. an outline of changes needed in the design and evaluation of development projects.

The following important elements are missing from the Review:

1. An understanding of the causative factors behind urban growth and urbanisation. Over the coming decades, urbanisation is inevitable and will be the major cause of transformation of Pakistani society.
2. An appreciation that wide-ranging earth degradation processes (e.g. erosion, waterlogging, salinity, sodicity, deforestation, rangeland degradation, loss of biodiversity and drainage of wetlands), are perhaps the more important causes of environmental degradation in Pakistan than pollution from industrial, municipal and vehicular emissions.

Accordingly, this discussion report elucidates the underlying causes of urban growth, the implications of sustainability for a national settlements policy, and on the use of nature as a sink for human wastes.

2. Causes of Urban Growth and Urbanisation

What causes Third World city growth? According to the seminal work by Kelley and Williamson (1984) it is the imbalance between Total Factor Productivity in agriculture/rural services sectors and the industrial/urban services sectors, not population growth nor rural push factors, which causes the growth of Third World cities. Rapid population growth in fact slows down urbanisation. It increases the supply of labour, lowers its price, and agriculture is the largest labour absorbing sector. Preston has shown that only those able to migrate do so; rural poverty promotes starvation *in situ*. Finally, there is no such thing as over-urbanisation as per the Todaro model. A rise in formal sector wages reduces employment there, increases labour supply in the informal sector, and reduces expectations of the migrant.

Thus the scale and pace of forthcoming urbanisation in Pakistan is determined by inelastic differences in technical progress between sectors.

Given that urbanisation is inevitable, what are its consequences? While the benefits of urbanisation, from scale and agglomeration economies, accrue after a time-lag, its costs are experienced in the short run. Because of the needs for paved roads, piped water supply, underground sewerage, lined drains, etc., the costs of absorbing people in urban areas are typically four to six times greater than the costs of rural retention [NHSPS (1984)].

What happens in the interim period before the benefits of urban investment are realised? Of course, a growing share of urban population in unserved *katchi abadis*.

3. The Need for a National Human Settlements Policy

There is a huge difference in the relative carrying capacities of different agro-ecological zones. Under high input agriculture, the irrigated plains can sustain more than 12 persons per hectare, while the dry mountains, western plateau and deserts can absorb no more than 3 persons per square kilometre—that is per 100 hectares. There is need to encourage out-migration from fragile eco-zones, (e.g. uplands, deserts) where land use is not sustainable, while promoting rural retention in robust irrigated areas.

4. Nature as a Resource and as a Sink

Local ecosystems can be overwhelmed by the discharges from even a small city. National settlement policies need to be informed by the concept of locational sensitivity in environmental impacts. Pakistan can sustain far higher levels of emissions from Karachi, located adjacent to the Arabian Sea, surrounded by a desert, and with no local potable groundwater aquifer than from cities, such as Faisalabad, located adjacent to Class I agricultural soils and fresh surface/ground waters.

There is need to promote the idea of the sustainable city, which re-uses and re-cycles water, energy and materials. Its land use plan results in efficient communications and transport.

Finally, there is need for imagination and foresight. For example, the country has only four partly operational conventional sewage treatment plants, and cannot afford the capital and operational costs of more. Sewage may be carried to livestock farms, treating and rendering it innocuous in the process of providing fodder for livestock.

Syed Ayub Qutub

Pakistan Institute of Environment—
Development Action Research,
Islamabad.