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ENVIRONMENT AND REHABILITATION

5.1 ENVIRONMENTAL GOVERNANCE AND REGULATION IN INDIA

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LEGISLATIVE EFFORTS

Legislative efforts at pollution control in India date back to the mid-nineteenth century.¹ Many of these Acts dealt with environmental regulation in a piecemeal manner and proved ineffective at reducing the levels of pollution. Action against polluters had necessarily to be initiated in courts by those affected. Pollution and environmental degradation were addressed very generally in terms of nuisance, negligence, liability, and a few principles of tort law.

The spate of legislations² in the post-independence period also dealt only incidentally with pollution. Both air and water pollution continued to increase.

Perhaps inspired by the Stockholm Declaration of 1972, the Water (Prevention and Control of Pollution) Act, 1974 (the Water Act), provided for the institutionalization of pollution control machinery by establishing Boards for prevention and control of pollution of water. These Boards were entitled to initiate proceedings against infringement of environmental law, without waiting for the affected people to launch legal action. The Water Cess Act, 1977, supplemented the Water Act by requiring specified industries to pay cess on their water consumption. With the passing

of the Air (Prevention and Control of Pollution) Act, 1981 (the Air Act), the need was felt for an integrated approach to pollution control. The Water Pollution Control Boards were authorized to deal with air pollution as well, and became the Central Pollution Control Board (CPCB) and the State Pollution Control Boards (SPCBs).

The Bhopal Gas leak disaster of December 1984 precipitated the tightening of environmental regulation. In 1985, the Department of Environment was changed to the Ministry of Environment and Forests (MoEF) and given greater powers. The Environment (Protection) Act, 1986 (EPA), was passed, to act as an umbrella legislation. The Act also vested powers with the central government to take all measures to control pollution and protect the environment. The Environment (Protection) Rules, 1986 were subsequently notified to facilitate exercise of the powers conferred on the Boards by the Act. The EPA identifies the MoEF as the apex policy making body in the field of environment protection. The MoEF acts through the CPCB and the SPCBs. The CPCB is a statutory organization and the nodal agency for pollution control. The EPA in 1986 and the amendments to the Air and Water Acts in 1987 and 1988 furthered the ambit of the Boards' functions.

Constitutional Directives

In terms of constitutional provisions, the 42nd Amendment of 1976 for the first time imposed an obligation on the part of the state (Article 48A) and the citizens (Article 51A(g)) to endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country. The economic reforms of 1991, the Rio Conference of 1992,

¹ The Shore Nuisance Act, 1853, the Indian Penal Act, 1860, the Indian Easement Act, 1882, the Bengal Smoke Nuisance Act, 1905, the Bombay Smoke Nuisance Act, 1912, and the Motor Vehicles Act, 1939 were some of the pioneering legislative attempts.

² These included the Factories Act, 1948, the Industries (Development and Regulation) Act, 1951, the River Boards Act, 1956, the Atomic Energy Act, 1962, the Insecticides Act, 1968, the Merchant Shipping (Amendment) Act, 1970, and the Radiation Protection Rules, 1971.

and growing environmental awareness all resulted in further amendments to the constitution.

Role of the Judiciary

The Supreme Court and High Courts have played an active role in the enforcement of constitutional provisions and legislations relating to environmental protection. The fundamental right to life and personal liberty enshrined in Article 21 of the Constitution has been interpreted by the courts to include the right to pollution-free air and water.³ Also, relaxing the enforcement of strict rules of proof and modification of the traditional rule of standing (*locus standi*) so as to facilitate public interest litigations has served, more or less, to remove the difficulty in individuals approaching courts for redressal.

The backdrop of all this has been the growing environmental awareness among the public. This has been demonstrated by public demonstrations and protests throughout the 1970s and 1980s⁴, growth in environment and development oriented non-governmental organizations (NGOs), citizen groups, and pressure groups in India (today, roughly 20 times the size in 1985), and the increase in the frequency of public interest litigations.

Working of Environmental Regulation

An analysis of the principal pollution control legislations, the Air and Water Acts, reveals that these legislations are mostly punitive in nature. The Pollution Control Boards (PCBs) have thus restricted their approach to pollution control to 'Command and Control' (CAC). This implies that the state agencies are to function as watchdogs to keep an eye on the existing industries. All new industries, before they start to function, would in this approach require prior permission to do so. The agency responsible then permits them to carry out industrial activity, subject to certain terms and conditions.

While the basic functions of the CPCB remain prevention, control, and abatement of air and water pollution, with the various SPCBs assuming these functions, the role of the CPCB is restricted to providing technical or scientific assistance. The CPCB has maintained the major role of prescribing the standard limits for various pollutants. While the SPCBs may prescribe stricter limits if they choose, they may not dilute the standards stipulated by the CPCB.

The SPCBs employ three instruments, namely, consent to establish producing units, consent to operate, and

standards for air and water pollution. Under the Water Act, consent is necessary for an industry to 'discharge effluent into a stream'. Under the Air Act, consent is necessary to 'establish or operate an industrial plant in an air pollution control area'. The other functions of the SPCBs are advising the state governments, formulation of preventive methods, technology development, regulation of location of industries, disposal of hazardous wastes, and collection and dissemination of information on the prevention and control of pollution.

The PCBs also have the power to move court for 'restraining apprehended pollution' as a preventive measure (Section 33 of the Water Act and Section 22A of the Air Act). In an extreme case, a PCB can give 'directions to any person, officer or authority' in the interest of pollution control, which 'includes the power to direct closure, prohibition or regulation of any industry or process, or stoppage or regulation of supply of electricity, water or any other service' (Section 33A of the Water Act and Section 31A of the Air Act).

Failure to obtain consent and violation of consent conditions makes the occupier of an industrial unit liable for punishment under both Acts. The punishment prescribed is imprisonment with unlimited fine. For minor violations of the Acts, such as failure to provide information, obstructing personnel of the Board from discharging their duties, and so forth, the penalty prescribed is imprisonment upto three months or fine of Rs 10,000 or both. More severe punishments are provided under both Acts for continued violation after the first conviction (Section 41 to 45A of the Water Act and Section 37 to 39 of the Air Act).

Thus, the role of the Boards is mostly that of an enforcer, and the primary functional tool employed by them for controlling industrial pollution is inspection of polluting units. The Water Act prohibits the discharge of pollutants into water bodies beyond established standards (Section 24), and requires that generators of all new and existing sources of discharge into water bodies get the prior consent of the PCBs (Section 25 and 26 respectively). It also lays down penalties, such as fines and imprisonment, for not complying with these (and other) regulations of the Act. Prior to 1988, enforcement was through criminal prosecution initiated by State Boards and by seeking injunctions to restrain polluters. After amendments to the Act in 1988, the Boards were given more teeth—they can now close errant factories or cut off their water or electricity by an administrative order. The 'command' therefore is the stipulation of certain upper limits of parameters, while the 'control' is the power to withdraw the power supply, water supply, and the imposition of the penalty (fines, imprisonment).

Concern has been expressed that the existing pollution control laws are not backed by sound policy pronouncements

³ Subhash Kumar vs. State of Bihar AIR 1991 SC 420, 424; M.C. Mehta vs. Union of India 1992 (3) SCC 256, 257; and Virender Gaur vs. State of Haryana 1995 (2) SCC 577, 581.

⁴ The 'Chipko Movement' was in protest against the alienation of traditional rights of users to forests, and the exploitation of timber by the forest departments.

and even when they are, it is more as an afterthought rather than as clearly formulated guiding principles. For example, neither the preamble nor the provisions of the Water Act or Air Act provide much concrete policy guidance. The Acts focus more on procedural details like setting up of the CPCB and SPCBs, their constitution, structure, powers and functions. It is only in the list of powers of the State Board under the Water Act that one finds any hint that the legislators understood that there might be costs to balance against the benefits of pollution control: 'the Boards are to evolve economical and reliable methods of treatment of trade effluents'.⁵ Even the rules⁶ issued under these Acts focus almost wholly on procedural matters. These rules illustrate the forms to be filled out by the Central Board for its annual report, list the fees for particular pollution tests, and give sample application forms for consent orders without describing how to make use of the information provided. Nowhere do the rules take advantage of the power granted to assist and guide SPCBs to promulgate substantive rules with policy import. As a result, policies exist without laws, laws without policies, and there have even been cases where policies have followed legislation. As late as 1992, nearly two decades after the enactment of the Water Act, the Government of India (GOI) came out with a Policy Statement for Abatement of Pollution. Some incongruencies that come to light are the following. The statement emphasizes 'promoting technological inputs to reduce industrial pollution'. However, it fails to assign the agencies responsible for this task. As of now, the function of PCBs extends to the granting of consent and implementing standards. They are not in any position to offer technical advice required by industry. Further, though 'public cooperation in securing a clean environment' finds mention in the policy statement, no legislation has evolved incorporating this even a decade after the policy pronouncement.

Pollution control laws have neither kept pace with constitutional directives, nor have they operationalized the space that exists for popular participation if these directives are truly understood. Environmental legislations, such as the Air and Water Acts, on the contrary, have a strong centralizing tendency, with the state and Central government as the exclusive decision makers. Further, none of these laws provide for co-ordinated functioning of the various enforcement agencies with the third tier of governance—panchayats and municipalities. There is nothing at all to involve local communities.

⁵ Water (Prevention and Control of Pollution) Act, 1974, Section 17(1)(h).

⁶ The Water (Prevention and Control of Pollution) Rules, 1975; The Water (Prevention and Control of Pollution) (Procedure for Transaction of Business) Rules, 1975; The Air (Prevention and Control of Pollution) Rules, 1982; The Air (Prevention and Control of Pollution) (Union Territories) Rules, 1983.

As a result, the activist role played by the higher judiciary has been on the rise. This has included issuance of administrative orders to the extent that the courts have been forced to catalyze the legislature to codify certain legislations. For example, the Public Liability Insurance Act, enacted in 1991,⁷ fixed the liability on the occupier of an industrial unit for the damage caused to a third party. This was the legislative version of the judicial pronouncement of the Supreme Court in the Delhi Oleum Gas Leak Case.⁸

THE PREVAILING FORM OF GOVERNANCE

From the characteristics of the pollution control mechanism in place in India, it can be gleaned that there exists a command and control regime with a set of laws designed to perform a preventive rather than a proactive role. Even the constitutional provisions, while affirming the right of the State and the duties of the citizens, do so without upholding the corresponding rights of the individuals and the duties of the state. In other words, citizens cannot claim environmental protection as a right and the state is not bound by any duties to protect the environment. It becomes evident that environmental policy and law in India has not evolved in anticipation of a problem, but rather has been a knee jerk reaction to existing problems.⁹ Judging by the prohibitive levels of pollution in existence today it has been ill equipped to achieve any of the targets specified. The EPA, for example, came into existence to deal with all anticipated environmental problems with the hope that mass disasters of the Bhopal variety are prevented from recurring. In over a decade of its working, no evidence exists, both in its content and application, that this law has the potential to meet the challenges of mass environmental disasters.

Central and state governments and the CPCB and SPCBs have adopted a soft attitude towards polluting industries and have done little more than issue warnings. The result is that these laws are practised more in violation than conformity and a large number of industries operate without proper safety and pollution control measures.¹⁰

For successful implementation of the CAC policy envisaged, certain facilities are of paramount importance. These are infrastructure of the regulatory agencies, a thorough understanding of environmental problems, and most importantly the monitoring and enforcement

⁷ An Act to provide for public liability insurance for the purpose of providing immediate relief to persons affected by an accident occurring while handling any hazardous substance.

⁸ M.C. Mehta vs. Union of India AIR 1987 SC 982.

⁹ It may have also arisen out of elitist concerns, and not the concerns of those actually affected. Thus, they are overly ambitious on paper but lack effective deterrents and are inadequately implemented.

¹⁰ Parikh, Parikh, Tata and Laxmi (1999), p. 15.

capabilities of the regulatory agencies.¹¹ An evaluation of the PCBs, however, reveals that their working is rife with shortcomings.

Enforcement

The primary functional tool employed by the PCBs for controlling industrial pollution is inspection of polluting units. Given the penalties in force for non-compliance in India and keeping in mind the extent of the SPCBs' powers, the impact of inspections on compliance is only as strong as the threat of enforcement and punishment faced by the industrial units. Studies conducted reveal that there appears to be no impact of inspections on emissions.¹² The reality is that environmental management often degenerates into crisis management. Inspections are undertaken at the time that operating consent is granted and thereafter usually only in response to complaints, accidents, or other emergencies. Enforcement by the PCBs, as a result, is woefully inadequate.

Further, a study conducted by the Planning Commission found that they do not have a complete inventory of polluting and potentially polluting industries. Small industries (capable of high levels of pollution) have been left out of the purview, further undermining efforts at pollution control. Small industries are known to contribute as much as 40 per cent of air and water pollution.

Monitoring

Monitoring conducted by the PCBs is also far from effective. Polluting industries may make a one-time investment and set up Effluent Treatment Plants (ETPs). Around 2–5 per cent of its capital investment may be so spent on pollution control. The costs of operating these facilities are anywhere between 15–30 per cent of the investment made, annually.¹³ As operating costs are high, industries are often reluctant to run these plants. Poor monitoring almost always allows units to get away without operating these plants properly. The PCBs claim that inadequate manpower limits their monitoring.

Poorly Staffed

The Planning Commission study revealed that the PCBs are very poorly staffed. The study highlighted the predominance of non-technical members in most of the Boards, the lack of professionals in the composition of the Boards, and also the tendency to not fill vacancies of members representing local bodies. Thus, both motivationally and in ability, the PCBs are ill-structured.

¹¹ To be effective, CAC with ambitious targets, would include much cost, and steep punitive measures.

¹² Pargal et al. (1997), p. 16.

¹³ Parikh, Parikh and Tata (1999), p. 10.

Lack Technical Skills

One of the reasons for ineffective monitoring is the lack of technical skills of the PCBs. For instance, the Biomedical Waste (Management and Handling) Rules, 1998 specify the working of incinerators so as to reduce emissions of toxins like furans and dioxins. However, neither the CPCB nor the SPCBs have the capacity to even collect samples, let alone analyse these toxins.

Inadequate Funding

The principal sources of funding for PCBs are government grants and revenue collected under the Water Cess Act. In actual fact, PCBs are starved for funds. The result is inadequate infrastructure in terms of laboratories, monitoring equipment, and regional offices, inadequate staff, both technical and administrative, and an inability to discharge their primary functions. For example, the Bihar Pollution Control Board (BPCB), which administers pollution laws in the second most populous state of the country, has continuously been deprived of funds. For several years, the state government withheld funding, restricting BPCB expenditure to less than a third of its modest requisition. Even ten years after the enactment of the Water Act, the BPCB did not have a single laboratory or analyst to test effluent samples.¹⁴

A subset of the issue of inadequate funding is the manner in which the SPCBs have made expenses. An analysis of the expenditure incurred by the SPCBs during the Eighth Five Year Plan shows that the primary expenditure was on administration amounting to 57 per cent. The ratio of capital expenditure to total expenditure was about 14 per cent. Maintenance, depreciation, and other expenses constituted the major chunk of the remaining part. It follows that expenditure on pollution prevention activities, training, and research and development was for all practical purposes negligible.

Lack of Willingness to Implement Policy

A lack of willingness to implement policy is also apparent. While the PCBs have the authority to cut off the electricity and water supplies of polluting industries, launch prosecutions, and initiate proceedings against top management so as to hold them personally liable, the use of these measures has been meagre. With hardly any local representation inclusive of people who are affected, this is almost inevitable. In addition, they have failed to bring the offenders to book. For example, in Rajasthan only two convictions have been obtained, despite nearly 7000 cases filed in court against air and water polluters.¹⁵

¹⁴ Divan and Rosencranz (2001), p. 3.

¹⁵ Parikh, Parikh and Tata (1999), p. 13.

Political Interference

However, the argument is made that PCBs are, sometimes, not able to exercise powers to force compliance because of interference from powerful interest and pressure groups. Such interference is sometimes based on the argument that strict compliance with standards will lead to closure of industrial units, which in turn may result in unemployment and protests. This interference is hardly surprising given that often the Boards are represented by vested interests responsible for pollution. With the position of the Chairman of the Boards invariably being a political appointee, political interference is rampant, and internal sabotage of most cases is then almost inevitable.

Variations in Enforcement

The high degree of political interference may be one of the factors responsible for wide variations in enforcement across states. It has been argued that although states cannot compete by lowering environmental standards in order to attract new investment, they can get around this by lax enforcement.¹⁶ This could be the outcome of a so-called 'race to the bottom' for environmental quality in which states invariably sacrifice the environment in the competition for jobs and economic growth. For example, there exists no uniform procedure for the grant of consents under the Air and Water Acts. Some SPCBs grant consents for a fixed period, usually between 1 and 3 years while the others may issue open-ended consents. The consent fee structure and industry classifications also differ widely across States, suggesting inequitable horizontal treatment of industrial units. For instance, if an industrial unit falling in the investment limit between Rs 50 lakhs and Rs 100 lakhs applies for consent from the Madhya Pradesh Pollution Control Board, it is bound to pay Rs 7500 as fees whereas if the same unit applied for consent from the Kerala Pollution Control Board, the fee would be Rs 2000. Non-filling of the sanctioned strength is one of the factors behind widely varying per unit staff ratios across SPCBs. In Andhra Pradesh, one technical person has to monitor 100 units whereas Kerala and Himachal Pradesh have 14 and 12 persons respectively for the same task. The norms for determining the staffing pattern of the boards have not been prescribed, leading to wide differences in the per polluting unit availability of staff for monitoring.¹⁷

PERVERSE INCENTIVES UNDER CAC

Consent from the PCB is necessary before any industry is set up. After the consent, the industry is supposed to maintain

the characteristics under the prescribed norms. This approach permits little flexibility in the means of achieving goals as it forces all firms to make similar efforts to control pollution. As the standards are source-specific, being neither either technology based or performance based, this policy gives little incentive to polluters to search for cleaner technologies or improved abatement technologies.

Another drawback is the inability to take advantage of the economic efficiency possible in pollution control. While standards with strict implementation may limit emissions of pollutants, they typically exact relatively high costs in the process, by forcing firms to resort to unduly expensive means of controlling pollution. On the governments' side, they impose high monitoring costs. As the marginal abatement costs vary among firms, the appropriate technology in one situation may not be as cost-effective as in another.

The penalties for non-compliance with standards are unrelated to the compliance costs. The prosecution and court decisions are based on compliance or non-compliance and not on the extent of compliance. The fines are prescribed in nominal terms and are independent of the quantity and quality of emissions.

The ambient and source standards are laid down independently, unrelated in terms of the volume of pollution generation activities. As a result, it is quite conceivable that the quality of the environment could continue to deteriorate even with a high degree of compliance. For example, according to the standards stipulated regarding the ambient air quality, five parameters are chosen. If in the analytical reports of ambient air quality, these five parameters are under limits, the ambient air is deemed fit for human consumption. If this indeed were so there would be no phenomenal rise in respiratory problems.¹⁸

Command and Control approaches are inefficient for the regulatory agency as well, as detailed information about production processes and various pollution control devices is required before setting standards. With diverse industries, it becomes expensive and time consuming to obtain the necessary information of each industry. The Minimum National Discharge Standards,¹⁹ for example, have been established to enforce industrial discharges. Set at levels at or near the maximum effluent reduction technically achievable, they are in general economically unrealistic and technically unfeasible. In the face of such standards dictated by the CPCB, the SPCBs are forced into an inflexible position in which the only two alternatives they have are ordering non-compliant industries to close or not enforcing the standards at all (if they are serious about implementation).

¹⁶ Gupta (1996).

¹⁷ Evaluation Study on the Functioning of State Pollution Control Boards, Programme Evaluation Organization, Planning Commission.

¹⁸ Brandon et al. (1995), p. 5.

¹⁹ Environment (Protection) Rules, 1986 (Schedules I and VI) respectively.

As a result of these prohibitively high standards it was found that a significant proportion of units discharging trade effluents into water streams do not have treatment plants in the states of Assam, Tamil Nadu, Punjab, Kerala, Karnataka, Gujarat, and Haryana. Similarly, a considerable proportion of units emitting air pollutants do not have any air pollution control measures in the states of Punjab, Assam, Bihar, Gujarat, Karnataka and Kerala.²⁰ This inflexibility often results in protracted negotiations and even litigation with considerable costs involved.

Cost-effectiveness is further hampered by the fact that standards do not take into consideration factors such as carrying capacity of the environment. Stipulations for standards can be broadly divided into cumulative parameters and specific parameters. Our laws stress cumulative parameters rather than specific parameters. Many studies have shown that certain pollutants have the capacity of bio-accumulation. As the number of industries obtaining consent is on the increase, the pollution load on the ecosystem is getting heavier by the day. As a result the carrying capacity at some places has long been crossed.

The existence of more than one set of standards presents a lack of clarity. For example, the Environment (Protection) Rules prescribe industry specific standards and national minimum standards.²¹ The industry specific standards in Schedule I are restricted to only select parameters and are not necessarily exhaustive. The Schedule VI standards apply to all industrial units for which specific norms are not published in Schedule I. However it is not clear if the minimum national standards in respect of *other* parameters apply to the industries specified in Schedule I. Consequently, the adoption of different standards remains within the wide discretionary powers of the PCBs.

Since the stipulation of standards by the regulatory authorities there has been no revision in upper limits or enforcement of stricter limits. Neither has any mechanism evolved to permit the PCBs to review the same at regular intervals.

In terms of court-driven implementation of pollution control measures, on several occasions both the High Courts²² and the Supreme Court²³ have admonished the PCBs for failing to implement pollution control laws. In

²⁰ Evaluation Study on the Functioning of State Pollution Control Boards, Programme Evaluation Organization, Planning Commission.

²¹ Environment (Protection) Rules, 1986 (Schedule I, Schedule II, Schedule III).

²² Bayer (India) Ltd. vs. State of Maharashtra 1994 (4) BOM.C.REP. 309, 330; Pravinbhai Patel vs. State of Gujarat 1995 (2) GUJ.L.R. 1210, 1234; V. Lakshmi pathy vs. State of Karnataka AIR 1992 KAR 57, 70; Suo Motu vs. Vatva Industries Association AIR 2000 GUJ 33, 35.

²³ M.C. Mehta vs. Union of India 1998 (3) SCALE 602 and 1998 (4) SCALE 326.

the Ganga Pollution Case,²⁴ the Supreme Court emphasized that notwithstanding the comprehensive provisions contained in the Water Act, the State Boards had not taken effective steps to prevent the discharge of effluents into the river. The court further observed that when statutory authorities do not discharge their duties then the courts had the power to issue appropriate direction. Further, the Delhi Oleum Gas Leak Case can be used to demonstrate the role played by the courts in plugging lacunae in the existing legislation. The Air and Water Acts do not have any provision for compensation to those affected by pollution. This judgement widened the scope of Article 21 by lying down that the power of the Supreme Court includes the power to award compensation.

But this model of ad hoc court-driven environmental law enforcement raises severe problems. The appropriateness and suitability of courts of law in deciding matters that require technical expertise is questionable. The Indian judiciary has little technical expertise. Further, long delays in delivering judgements are more the norm. There is no viable alternative dispute settlement or conciliation mechanism either.

SUGGESTIONS TO FACILITATE MORE EFFECTIVE REGULATION

Every pollution control law ought to be preceded by clear policy pronouncements. The laws enacted ought to incorporate the policy and worry about appropriate mechanisms for implementation. Codification and consolidation of pollution control laws, that do away with the overlaps is needed. Laws ought to be enforced within a clear time-bound frame and administrative accountability ought to be ensured.

However, a country's institutional capacity to implement and enforce environmental governance is a key consideration. Monitoring and enforcement pose huge pitfalls for the regulatory agencies in India. In spite of the potential cost of non-compliance to industries being not trivial (in terms of the penalties imposed), compliance is weak. The suggestions made below to facilitate better regulation take into account the weaknesses of the regulatory agencies, especially in terms of monitoring and enforcement.

Regulatory Approaches

While regulatory approaches are the most popular approach to environmental problems, favoured by policy makers because of the certainty of outcome they offer, they are also the most costly in terms of monitoring and enforcement. Nevertheless, in some cases these are the only feasible

²⁴ M.C. Mehta vs. Union of India, AIR, 1988, SC, 1037.

instruments by which to achieve the aims of public policy. For example, controlling emissions of hazardous substances will generally best be accomplished by outright bans. Similarly, land zoning regulations are the most effective means to ensure that residential areas are not downstream or downwind from polluting factories. In such cases, strict implementation of the laws and credibility of the sanctions imposed must be ensured to make sure that regulations are effective.

Combination of Approaches: Some regulatory approaches are more efficient than others. One that is particularly inefficient is to stipulate abatement technologies—this tends to discourage innovations that have the potential to limit pollution emissions more cheaply. In such cases, the use of a combination of approaches may be a better alternative.

For example, in Malaysia, a combination of standards and charges has been effective in reducing water pollution from palm oil mills. After being given one year to install treatment facilities, palm oil mills were required to reduce their wastewater discharges, taking biological oxygen demand (BOD) concentration as the key parameter. Progressively stringent effluent standards were implemented in four stages. In addition to the standards, effluent charges are levied on the BOD load discharged. The palm oil industry has made steady progress towards meeting the target of 100 mg/l BOD. A progressive reduction in the total BOD load discharged was recorded from 563 tons a day in 1978 to 5 tons in 1989 despite a 93 per cent increase in the number of palm oil mills over the same period.²⁵

Differential Penalties

In instances where monitoring by regulatory agencies is low, some non-compliance can be attributed to the optimizing behaviour of firms. This implies that firms may choose to remain non-compliant if the incremental cost of moving to compliance is greater than the expected loss associated with discovery and payment of penalties.

*Use of the Becker Model of Deterrence:*²⁶ The optimal penalty literature begins with Becker's (1968) economic analysis of crime, the basic insight of which is that potential criminals respond to both the probability of detection and the severity of punishment if detected and convicted. Thus, deterrence may be enhanced either by raising the penalty, or by increasing monitoring activities to raise the likelihood that the offender will be caught.

Since increasing the probability of detection requires some expenditure on government monitoring, Becker's policy prescription is to set the probability of detection arbitrarily low, thus raising the penalty.

²⁵ World Bank (1997), p. 42.

²⁶ Becker (1968).

In reality, however, we do not observe such high penalties and low detection rates. Among the reasons for not imposing high sanctions are limited wealth of the offender, risk aversion, and exogenous conditions such as legislation or social norms of fairness. Thus, we are left with a government enforcement policy that requires a significant amount of monitoring expenditures.

Several innovations have been suggested to reduce expensive government monitoring. One such innovation is the idea of *differential penalties* and *differential approaches monitoring rates* based on each firm's prior compliance history. For example, SPCBs may employ differential norms for monitoring units based on complaints made or penalties issued in the past.

Extending this idea further in the Indian context, one may consider the idea of *differential consents*. Consent terms may be rationalized by classifying industries depending on their polluting nature and consents may be issued on this basis for longer or shorter periods. This practice has apparently been introduced in Maharashtra where less polluting industries are issued consent for longer periods and potential heavy polluters are monitored more frequently by means of annual consents.

Limited Use of Market Based Instruments (MBIs)

Laws, systems, and approaches should be such that monitoring and active enforcement by regulatory agencies can reduce considerably in the long run. This can only happen if potential violators are provided with sufficient incentives to comply with the laws and penalties against non-compliance. Any incentive that does not equal the benefits gained through non-compliance²⁷ will fail to achieve its purpose. At present, the government does provide some incentives, such as depreciation allowance, water cess, concessional custom duty, excise duty, soft loans for purchasing effluent control machinery, and targeted subsidies. However, there is little evidence of their effectiveness.

Although they may appear to be blunter than other more targeted MBIs, the following approaches have proven easier to administer and implement.

Removal of Subsidies: Many subsidies actually serve to reduce the cost of overexploiting or polluting the environment. Market based instruments that reduce subsidies that harm the environment reduce costs to the Treasury with important fiscal consequences. Recent estimates put environmentally damaging subsidies at over \$240 billion per year in developing and transition economies.²⁸

²⁷ If incentives are not linked to actual levels of pollution in effluent, then firms could end up with getting incentives and not incurring the costs in abatement.

²⁸ World Bank (1997), p. 10.

For example, it has been argued that in Brazil, the exemption from taxation of virtually all agricultural income (allied to the fact that logging is regarded as proof of land occupancy) has provided strong perverse incentives to the private sector to acquire forestlands and to then deforest them.²⁹

Self-Enforcing Policies: Recognizing that the highly 'enforcement-intensive' market based approaches of industrial countries are difficult to adopt, many developing countries are experimenting with more self-enforcing policies (such as deposit-refund schemes and performance bonds) with fewer points of intervention. In this manner, active enforcement is kept to a minimum while raising the financial costs of non-compliance. In both these cases, a financial bond or deposit is used to guarantee compliance with the desired outcome such as meeting environmental standards, or correctly disposing of waste products.

The basic idea of a deposit-refund system is to let those who generate waste be responsible for the associated costs and to provide incentives to encourage waste recovery and recycling. For example, in 1989 Taiwan established a deposit-refund system to recycle polyethylene terephthalate (PET), the plastic commonly used in soft drink bottles. Under the system, members of the industry have formed a foundation that administrates a joint recycling fund to cover costs of collection and recycling of the bottles. The fund is replenished from a deposit on the sale of each bottle. Those returning PET bottles to collection locations receive a refund per bottle. By 1992, the PET recycling rate was 80 per cent.³⁰

Similarly, performance bonds require firms to post monetary bonds and forfeit them if they pollute.

Taxes

Environmental taxes send a signal of the right cost to polluters by including the lot of their negative externality costs. Rather than result in distortions, these taxes discourage 'bads' such as pollution. Taken a step further, environmental taxes can yield a 'double dividend' if the revenue from them is used to reduce and mitigate the effect of tax distortions.

In situations where weak monitoring capabilities imposes constraints, blunter instruments, such as fuel taxes, with fewer points of intervention may be more appropriate.

Reform of Water Cess: Though designed as a resource tax on specified water consuming units, the water cess is capable of serving as an effluent tax as well. It has been suggested that the cess be based on the effluent load generated by a firm so as to force industrial units to internalize the costs

of their pollution.³¹ Another suggestion recommended is to levy the cess only on discharges in excess of the effluent standards. This is similar to China's water pollution levy system given below.

China's Pollution Levy: An industrial pollution levy system exists in China on emissions that exceed standards. Government revenues from the pollution levy have increased rapidly, from 1.2 billion yuan in 1986 to 2.7 billion yuan in 1993. The pollution levy now provides about 15 per cent of all capital expenditure on pollution control and is the principal source of funding for regulatory enforcement activities!³²

To provide incentives for enterprises to further reduce the (within-standard) pollutant discharges into water, a fee charged on the total quantity of wastewater discharged was introduced in 1993. The collections of this within-standard fee now amount to over 10 per cent of the collections of the over-standard fee. Results of the tests of the levy system suggest that the water pollution levy has been appropriately targeted and has been effective at reducing water pollution.³³

Defining Property Rights

Establishing property rights for land, water, and logging concessions provides a fundamental incentive for better resource management. When squatters become owners and forest dwellers have long-term user rights, there is a built-in incentive to exploit natural resources in a sustainable manner.

Taking this argument further, property rights, say for clean air, can be negotiated with 'polluters rights to pollute'. A fair trade-off can in principle be arrived upon through consultation between the directly affected stakeholders. Systems that debar or discourage such negotiation therefore end up being far from optimal.

Establishing Tradable Permits

Tradable pollution emission permits are the best known examples of market creation, and the evidence is that they are effective as long as a number of important design issues are addressed. First, the permit must actually create a property right. If there is any doubt on this count, then firms will not participate in the market. Second, the question of initial allocations of permits must be handled equitably. Finally, there must be no artificial obstructions to trading permits.

The fact is that as institutional capacity is among the scarcest of resources in India, there would be good reason

²⁹ Binswanger (1989).

³⁰ World Bank (1997), p. 36.

³¹ Gupta (1999), p. 112.

³² World Bank (1997), p. 27.

³³ Afsah et al. (1996).

to seek institutionally less-demanding approaches to pollution control as opposed to complicated tradable permit schemes. Keeping this in mind, one way to make a beginning could be to focus initially on only industrial estates to implement tradable permit schemes. This would facilitate identification of small groups of serious polluters, which the pollution control agency could regulate effectively with its existing resources. A suggestion is to cap the total emissions/discharges of the estate and have the potential occupiers carve up the available pollution limit among themselves.

In the most recent amendments of both the Air and Water Acts, the public has been given right of access to certain information relating to consent conditions imposed by a Board (Section 49(2) of the Water Act and Section 43(2) of the Air Act) and a citizen can file a complaint with the court against any polluter after giving notice of 60 days to the prescribed authorities (Section 49(1)(b) of the Water Act and Section 43(1)(b) of the Air Act). This has not yet succeeded in facilitating the involvement of the public. Some suggestions to better facilitate public involvement follow.

Participation and Community Involvement

This may be useful especially when institutions are weak and enforcement expensive. Public participation and community involvement can be effective in enforcing sustainable resource use and adapting local conditions to development needs.

This approach has been effectively utilized in the market economy, as evidenced by Japan. Local government and resident groups in Japan negotiate with firms to arrive at a detailed written agreement on emissions levels. Between 1971 and 1991, the number of agreements increased from approximately 2000 to 37,000.³⁴

*Example of Bhavani Dam.*³⁵ A similar approach was recommended when conflicts arose between agriculturalists, industry, and domestic users for water in the Bhavani River Basin in Tamil Nadu. Effluents discharged by industrial units upstream of the Bhavanisagar Dam would accumulate in the reservoir. This led to farmers' organizations and NGOs protesting against the effects of effluents on the quality of water for downstream uses such as irrigation and drinking, and to the seemingly unbelievable situation of the downstream users asking the authorities not to release the dam water. As redressal through the judicial system was thought to be an expensive and time-consuming process, the recommendations were that the stakeholders in the basin establish a forum whereby they could discuss and

negotiate the issues relating to the use of water resources. Informal and transparent contractual settlements could be worked out, and legal remedies were to be sought only if negotiated settlements failed.

The functioning of the SPCBs as of now precludes participation of the local populace who may be directly affected by pollution of their environment. Community participation could take the form of community groups monitoring the samples generated by the polluting industries and getting the same tested (in private labs). Funding for such activity could be provided under the SPCB separately. This would effectively prevent the polluters-authorities nexus. The State Pollution Control Boards could also impart the necessary training to such groups.

Public Discussion of the Environmental Assessment of Projects

One avenue to participation that has proven to be particularly effective is the requirement for public discussion of environmental assessments of major projects. This has raised public awareness of environmental problems and given whole communities an effective voice in deciding how the development process will affect aspects of their environment.

Attempt to Dilute Existing Legislation: In January 2001, the MoEF proposed to further amend the existing Environmental Impact Assessment Notification of 1994 (see Box 5.1.1). The main proposal is to drop the requirement to hold public hearings in the case of 'Small Scale Industrial Units, Mining Projects up to twenty five hectares, widening and strengthening of Highways, and modernization of existing Irrigation Projects', the argument being that 'the environment impacts of such projects can be assessed on the basis of the information provided by the project proponents to the Ministry even without a public hearing'. This move has been widely denounced as an attempt to dilute the notification and reduce transparency. Small units cause at least as much as 40 per cent of the pollution in India, Mining units could be highly polluting and disrupt life for miles around.

Role of NGOs

NGOs can provide the vital link between industries, communities, and regulatory authorities. In a study conducted of a sample of 250 industrial plants in India, 51 plants indicated that they had undertaken abatement in response to NGO pressure and 102 said they had done so in response to complaints from neighbouring communities.³⁶ In 1994, the Philippines received a \$20.8 million grant from the Global Environmental Facility to conduct a seven-year project to conserve the nation's biodiversity. Recognizing that the

³⁴ Thomas and Belt (1997).

³⁵ Parikh, Parikh and Tata (1999), p. 6.

³⁶ Pargal et al. (1997), p. 6.

Box 5.1.1

GBUS: Greens see Red over Project Clearance Norm Changes¹*Shyam Parekh*

If a draft amendment to the Environment Protection Act comes through, almost 90 per cent of the industrial projects will come up without facing environmental public hearings (EPH). This, experts fear, will reverse years of conservation efforts.

The draft notification was issued by the Union Ministry of Environment and Forests on 3 January, 2001. It proposes to amend the environment impact assessment (EIA) notification on 'impact assessment of development projects (1994)', issued under the Environment Protection Act (1986).

'It is ironical that a mere three-line amendment will exclude small-scale industries, highway and mining projects besides modernization of existing irrigation projects from the hearings. Such projects comprise over 90 per cent of the total projects,' says Mahesh Pandya of the Centre for Social Justice (CSJ), who attended a hearing in Delhi in this connection on 23 April.

At present, as many as 30 types of projects are required to pass through the EPH to seek environmental clearance from the Centre. But with these changes four categories will be excluded. And small-scale industries are known for pollution.

Instead of considering the pollution load and other factors, such industries will get clearance on the basis of the investment and area occupied. The Centre had imposed certain restrictions on expansion and modernization of any project, unless environmental clearance was granted by the government.

The draft notification states 'It has been found that small-scale industrial units, mining projects with lease area up to 25 hectares, widening and strengthening of highways and modernization of existing irrigation projects have minimal impact, both on the environment and on people residing in the vicinity.'

It states that the environment impact of such projects can be assessed on the basis of the information provided by the project proponents to the ministry without a public hearing.

However, Gujarat Pollution Control Board chairman K.V. Bhanujan says 'such an amendment will not have any major impact on the environment'.

Says Pandya, 'There is a general tendency to set up industries even in the small-scale sector anywhere in a haphazard manner. This is more so in the case of Gujarat where many small-scale industries have mushroomed causing extensive damage to the environment. No systematic study is conducted or environmental status prepared, before setting up such units. Without proper effluent treatment plants such small-scale industries [SSIs] add to the pollution load if viewed collectively at the level of a large industrial unit.'

Some SSIs engaged in the manufacture of pesticides, radioactive goods, and hydrochloric acid figure in the category of highly polluting ventures. The pollution in the Golden Corridor between Vadodara and Vapi caused by small-scale industries is one such example.

Experts believe that such units should not be excluded from the purview of rules relating to EPH as it is just because of the investment range that they are categorized as SSIs. The criteria for EPH should be based on the pollution load of the industry concerned irrespective of whether the investment involved is large or small.

The CSJ represented that it is absolutely necessary to obtain environmental clearance through EPH in the case of highways passing through towns, cities and reserve forests. Such EPH should be held in all places through which the highway passes.

Besides, mining projects related to fluospar and radioactive minerals cause undue damage to environment. Such industries should not be exempted from the EPH on the basis of the limited lease area of occupation.

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Source: 18 May 2001, *Times of India*.

national government alone would not be able to protect biodiversity, the project was designed to form partnerships between the public and private sectors by integrating the assistance of NGOs into the management of protected areas at national and local levels. This arrangement is being implemented at 10 priority protected areas (a total of 1.25 million hectares of land, wetland, and water areas).³⁷

Information Disclosure

Informed public opinion can also play a powerful role in exposing and holding private firms and government agencies

accountable. Such public disclosure and public education campaigns often have a much more powerful impact than more traditional regulatory approaches. In addition, these offer the possibility of fulfilling the large and growing need for pollution control despite limited budgets and staffs, by allowing the public to monitor the performance of individual firms and their compliance with environmental regulation.

Example of Indonesia—PROPER: Faced with acute pollution problems, shortage of environmental protection funding, and weak enforcement of regulations, the Indonesian government has experimented with a programme for rating and publicly disclosing the environmental

³⁷ World Bank (1997), p. 49.

Box 5.1.2
The Politics of Pollution¹

Delhi Janwadi Adhikar Manch

It is nobody's argument that pollution is not a serious problem. It affects us all, and in particular the poor. The poor with their wretched living and working conditions, negligible access to health care, and lack of any alternatives have to bear the brunt of the ill effects of pollution. A rational approach to tackling the problems of pollution ought bear in mind the causes, the interlinkages between the various causes, and the different sections of society affected by uneven effects of the same.

We have outlined below the major causes of pollution in the city of Delhi, the sections responsible for this pollution, and those chiefly affected by it. In the context we have attempted to show the total irrationality of the approaches of various governments, the judiciary, and the administration to solving the problems of pollution.

A major source of air pollution is the vehicles that ply in the city, contributing 64 per cent of Delhi's air pollution. Pollutants from vehicles are no less dangerous than industrial pollutants. Despite the welcome introduction of compressed natural gas (CNG), most vehicles in Delhi burn up diesel or petrol.

The total number of vehicles in Delhi shot up from 16 lakh in 1990 to 26 lakh by 1996, and is projected to reach 46 lakh vehicles this year! Given that private cars and two-wheelers account for the majority of the 46 lakh vehicles, it is clear that the problem of air pollution cannot be tackled without curbing this unrestricted growth of private transport. This is not possible without providing a vibrant and viable public transport system. It allowed public transport in Delhi to degenerate. Another major cause of pollution in Delhi is its industry. Some sources put the number of polluting units in Delhi at around 7000 but even official figures vary. The Central government's White Paper on Pollution in Delhi (1997) states that the volume of air pollutants that Delhi has to breathe each day increased from 1450 tons per day in 1991 to 2890 tons by 1995. Obviously, it has increased since then. Industry used to contribute about 12 per cent of air pollution in Delhi, or about 325 to 350 tons each day. But with the closure of 243 brick kilns and 46 hot mix plants in 1996, the contribution of industry has reduced to less than 10 per cent. However, given the toxicity of the fumes emitted, the effects of these pollutants are far more significant than the mere volume. For instance, among the list of 27 industries targeted by the Delhi government are electroplating, anodizing, plastic, PVC compounds, and other industries, all of which emit highly toxic fumes during the production process.

The Yamuna river is the main natural source of water to the city. At the point at which the river leaves Delhi at Okhla, the level of oxygen in the water has been measured at 1.3 mg/litre against the minimum permissible level of 5 mg/litre, and the total coliforms (bacteria) at 329,312 per 100 ml against the acceptable level of 500 per 100 ml. Contrast this with the levels when the water enters Delhi at Wazirabad: the dissolved oxygen level is 7.5 mg/litre, and the bacterial level 8506 per 100 ml.

The total wastewater discharged in Delhi is about 2160 million litres a day (mld). Of this, industrial pollution contributes 320 mld; much of the rest derives from domestic sewage. Again, the contribution to toxicity of industrial pollutants is more than as suggested by the volume of pollutants, given the use and unregulated disposal of chemicals and toxic substances. These either seep into the ground to contaminate groundwater or flow into the Yamuna via twenty drains in the city, of which the Najafgarh drain alone contributes over 40 per cent.

There is another factor that makes the problem of industrial water pollution more acute. At Wazirabad Barrage, the point where the river enters Delhi from the north, the water is trapped to supply Delhi its drinking water. During the dry season, none of this water is allowed to enter Delhi. Hence from October to June, the 'water' that flows through Delhi is the untreated or partially treated sewage and industrial waste that flows into the Yamuna through the drains, besides some irrigation water for the Agra canal. This has ominous consequences for those who use the river water downstream.

WHO ARE THE MOST AFFECTED?

The effects of pollution on an individual's health are also influenced by incomes because high incomes improve the ability to mitigate its worst effects. Better nutrition, airconditioning and bottle water are some means by which people can partially combat pollution. Yet there is no denying that these effects are nearly universal. For instance, a high proportion of children in Delhi below the age of 5 years suffer from respiratory disorders, and this affects children from most income groups. But, even here the impact on the poor is more, given their general poorer health, worse living conditions, and limited access to health care.

The sections most affected by industrial pollution are the workers themselves. Most units that have been targeted for closure in Delhi operate in small spaces of around 50 square metres, with little or no ventilation. In Wazirpur, acid is used in the process of steel production. The fumes are so strong that the workers regularly find it difficult to breathe. For instance, workers in a copper wire unit in Vishwas Nagar knew fully well that they are more affected by the pollutants than those outside. In this factory, copper is cleaned with chemicals, which emit fumes. Then varnish is applied to the copper wire, and it is heated to help it dry quickly. This emits a vapour, the regular inhalation of which causes TB. Those we spoke to said they eat *gur* regularly to prevent getting TB, and knew several other workers suffering from TB.

Among the list of 27 industries targeted by the government initially is PVC (poly-vinyl chloride), of which hundreds of small units have shut down in Vishwas Nagar in East Delhi. PVC, or poly-vinyl chloride, is one the most widely used types of plastic.

¹ This paper draws much from DJAM (2001a) and DJAM (2001b).

In the manufacture of PVC pellets, dioxins are emitted, among which are some that cause cancer as observed by the WHO in 1997. Besides, in order to give PVC flexibility and strength, a plasticizer called dibutyl phthalate is used in its manufacturing process. As a recent report states, phthalates can harm the reproductive system, and can cause cancer of the liver and the kidneys. Phthalates 'are found in the atmosphere of primary PVC processing plants. This results in significant exposure to workers'. A study concluded that the greatest potential for exposure to dibutyl phthalate is to individuals who manufacture or handle these substances ([http:// 198.252.9.108/govper/EnvHealthPer/2000/Octoo.pdf](http://198.252.9.108/govper/EnvHealthPer/2000/Octoo.pdf) (Human Expose Estimates for phthalates).

Workers know that the pollution caused within a factory affects them, but as one worker in Tri Nagar said, 'Hum kya kar sakte hain? Naukri karna hai'. They have no option. A majority of them are not unionized. The struggles of workers in this city as elsewhere have mostly remained confined to wage and economic demands. Issues of workers' safety, health, and working conditions do not find a place in these struggles.

Besides those working inside dingy, closed units, those most immediately affected are their families who live in jhuggi-jhopris in the vicinity of industrial areas. It is they who are most exposed to the toxic fumes, chemicals, and drink the groundwater that is contaminated by toxic pollutants. In Wazirpur, which is a centre of steel pickling and electroplating industry, acid and chemicals used in steel processing collect in little lethal puddles on the road, through which the jhuggis' residents walk all the time. The air is foul with the smell of acid. During monsoon, the drains overflow, forcing people to walk through acid-laden water. Over years of industrial activity, the acid has seeped into the ground and contaminated the water supply. Besides contaminated water, the solid waste generated from processing steel lies around in piles. Studies have shown that they contain toxic heavy metals such as chromium, nickel, lead, and cadmium, which seep into the groundwater. This has serious long-term effects on the slum dwellers.

A third section of people affected by the polluted river are those who use the water downstream. The Central Pollution Control Board report says that the '500 km stretch from Delhi to Chambal [via Mathura, Agra, and Etawah] does not meet the criteria for its designated use, even in the monsoon season'. Pesticides such as DDT, BHC (benzene hexa chloride), and heavy metals are found in the water. It is the poor who use this heavily contaminated water for bathing.

In contrast to these poorest sections of people who are most affected by pollution, it is the elite that is most responsible for it. None of the 46 lakh vehicles that blacken the air we breathe are owned by workers from Vishwas Nagar, Tri Nagar, or Okhla whose livelihood has been hit. Contrary to middle class perception, the sewage that flows into the Yamuna is not caused by workers' families in jhuggis: two-thirds of Delhi's population receives little over two buckets per person per day. Residents of Golf Links, Sundar Nagar, Vasant Vihar, and other elite colonies use over 450 litres or thirty buckets per person daily.

Despite being the root cause of much of the pollution, elites are disproportionately less affected by it. Middle and upper classes have access to better nutrition and can withstand infection better. They are cushioned from the effects of pollution in more direct ways. It is they who have the resources to instal Aquaguard and other systems that purify drinking water. Today, there are numerous domestic and international companies that sell bottled water, at a price that only the rich can afford, enabling these companies to make huge profits from the failure of governments to provide clean water to those who can buy it.

The state's response has been to close or shift out industries, whatever the human costs of such actions have been. Relocating industry will only export pollution to neighbouring areas. Closure is a knee-jerk reaction, which affects those who are already most affected by pollution.

Any resolution of the current situation must adopt a holistic perspective, taking into account those who work in the factories, and their families who live in the area, their physical safety, health, and well-being. And for those same reasons, if small industry is to continue in Delhi, it cannot continue under the conditions that operate at the moment, violating most labour laws, safety norms, and in abysmal working conditions.

performance of Indonesian factories. The aim of the programme is to have a low-cost but effective means of putting public pressure on factories and providing incentives for factories to adopt cleaner technologies. The government, the community, and the market apply the pressure, through public disclosure, on factories with poor environmental performance. The Program for Pollution Control, Evaluation and Rating (PROPER) was introduced to the Indonesian public in June 1995. Based on the government's evaluation of its environmental performance, a plant is assigned a rating by PROPER. In the pilot phase of PROPER, 187 plants were rated. Those that rated poorly were privately notified and given time until December 1995 to improve. Preliminary results show that PROPER has a positive impact on factories' environmental performance. By December

1995—the time of full disclosure—the number of poorly rated plants had reduced.³⁸

Environmental Audits and Self-Monitoring by Industry: Experience in industrialized countries has also shown that firms react to popular pressure. To generate such pressure, citizens may be empowered through a 'right to information'. Making publicly available emission measurements and audit of firms can help citizens to be vigilant. In the Indian context, publishing details of consent applications, reasons for rejection and so forth would be the starting point.

Self-reporting is a substitute for government monitoring efforts that may reduce enforcement costs without

³⁸ World Bank (1997), p. 46.

compromising deterrence. Polluters are told to report any violation of pollution standards. The magnitude of penalty they receive will depend on whether the violation is reported voluntarily or if government enforcement authorities discover it when no self-report has been made. If it is the latter, then the penalty may be considerably higher.

Community Pressure

It has become increasingly evident that it is virtually impossible for the government to monitor the activities of individuals, industries, and institutions across the country. If the government is the sole monitoring agency, then corruption and inefficiency are likely to creep into the system. Vigilant stakeholders, with strong and technically equipped institutional support, can play a very important role in managing the environment.

'Coasean Bargaining': The starting point for thinking about community bargaining approaches to pollution control is the Coase Theorem. In his landmark essay, Ronald Coase (1960) pointed out that pollution control situations have a certain symmetry. Inefficient pollution imposes costs on victims, which exceed the costs of controlling that pollution. In other words, the marginal benefits of pollution control exceed the marginal costs. The existence of inefficient pollution damage therefore provides a motivation for the victims to take corrective action, even in the absence of any such incentives by the polluters. Such corrective action in the form of informal regulation will be likely wherever formal regulation leaves a gap between actual and locally preferred environmental quality.

Informal regulation can take many forms, including demands for compensation by community groups; social ostracism of the firm's employees; the threat of physical violence; boycotting the firm's products; and monitoring and publicizing the firm's emissions. Implicitly, such actions force recognition of the community's property rights in the local environment. They frequently work because firms do not operate in a social vacuum.

Direct Negotiation: This works on the premise that when formal regulatory mechanisms are absent or ineffective, communities will seek other means of translating their preferences into reality. Many cases of direct negotiation between plant managements and local inhabitants have been documented around the world. These informal arrangements may rely upon reputation concerns, direct threats, or social pressure (as seen in the Bhavani Dam example given above). Recent empirical work has indicated the widespread existence of such 'informal regulation'. Communities are often able to negotiate with or otherwise informally pressure polluting plants in their vicinity to clean up.³⁹

Engaging All Stakeholders: In light of the above, one of the implications for environmental regulatory policy is that the regulators no longer need to think of themselves as the sole enforcers. When participation by the community is introduced into the framework, supplemented by selective MBIs, then monitoring and enforcing rules and standards are no longer solely confined to the regulator. Environmental governance stands would improve greatly working through very important leverage points of charge, viz. in empowered communities, and the market.

5.2 THE ASSAULT ON WORKERS IN LAND USE POLICY AND PRACTICE IN DELHI⁴⁰

Delhi Janwadi Adhikar Manch⁴¹

In the last decade, the working class of Delhi has come under relentless attack. Hitherto, they were victims of a low-wage economy with little urban space that had compelled them into living and working in sub-human conditions. Now as industries close they are threatened by the spectre of joblessness and loss of their shelter, and are therefore forced to quit Delhi.

The link between livelihood, shelter, and the right to life was clearly elucidated in the Olga Tellis case in 1986.

The sweep of the right to life, conferred by Article 21 is wide and far-reaching. 'Life' means something more than mere animal existence. . . . An . . . important facet of that right is the right to livelihood, because no person can live without

³⁹ Pargal et al. (1996), p. 1.

⁴⁰ This paper draws much from DJAM (2001a), and DJAM (2001b).

⁴¹ Delhi Janwadi Manch is an NGO based in Delhi working for the rights of workers and the poor displaced by industrial relocation. It was formed on 16 December 1996, when various organizations came together to address issues arising from a series of Supreme

Court orders relocating polluting industries and cleaning up Delhi. Since then the DJAM has been organizing protest dharnas, holding public meetings, campaigning against the Supreme Court order through pamphlets, cultural programmes and rallies, mobilizing opinion in universities, the media and the public at large, joining the struggle of jhuggi dwellers against the ongoing demolition drive.

the means of living, that is, the means of livelihood. If the right to livelihood is not treated as a part of the constitutional right to life, the easiest way of depriving a person of his right to life would be to deprive him of his means of livelihood to the point of abrogation. [Supreme Court of India, from the Olga Tellis case (AIR 1986 SC 180)]

Today, fifteen years later, the milieu has changed and the right to life is being threatened by the same Court in the name of fighting pollution. There is no doubt that pollution is a major impediment to the well being of people at large, particularly for those who are compelled to work in hellholes and reside in crowded colonies or *jhuggi-jhopris*, which are poor in terms of civic amenities. Urban pollution also tends to pollute adjoining areas. It is our contention that if the aim is to fight pollution and improve the health of the citizens then it should begin by addressing the issue in terms of the disproportionately high impact of pollution on the lives of the poor working class.

If the Supreme Court itself violates the right to life of citizens and displaces lakhs of the working class, then the message is loud and clear that the issue of survival of the workers has become non-justiciable. This section brings out the massive displacement of ordinary people with the closure of industries and the demolition of slums, the working and living conditions of the bulk of Delhi's citizens, and the politics of slum clearance and pollution.

THE LEGAL CONTEXT

In 1985, a lawyer M.C. Mehta filed a writ in the Supreme Court, No. 4677/85, on pollution of the Ganga river. Since 1996, the Supreme Court began issuing a series of orders pertaining to the closure or relocation of industries from Delhi. In 1996, it ordered that: 168 'hazardous and noxious' and 'heavy and large' industries be moved from Delhi by 30 November 1996; 513 'extensive' industries (employing between 50 and 500 workers) in residential areas and 334 such units in other 'non-conforming' areas be relocated or closed down by 31 January 1997; 46 hot-mix plants be closed down by 28 February 1997; and 243 brick kilns be closed by 30 June 1997. Around 50,000 workers lost their jobs following these Supreme Court orders.

In February 1996, in another writ petition, filed in 1994, pertaining to pollution of the Yamuna river, the Court directed the Delhi government to undertake the construction of 15 Common Effluent Treatment Plants (CETPs) to treat industrial water pollution emanating from Delhi's 28 designated industrial areas. The Delhi and central governments were to pay a combined 50 per cent of the cost and the remaining half was to come from contributions by industry. Not a single industrial association has paid up its 50 per cent till date. Little progress having taken place for

over five years, on 13 September 1999, the Court asked the Delhi government to ensure that, from 1 November 1999, no industrial effluent is allowed to be discharged directly or indirectly into the Yamuna.

The second round of closures, this time only of polluting units, began in January 2000, continuing intensively until March. Hundreds of polluting units were closed down by teams of SDMs (Subjudicial magistrates). They had a rough list of polluting units provided by the Delhi Pollution Control Committee (DPCC)—based on a survey that DPCC officials themselves confess as being unscientifically prepared — and also identified other polluting units during their visits and sealed them with police assistance. According to an affidavit filed on 8 July by the Chief Secretary, Delhi government, as many as 3177 units had been shut down by early July 2000.

The further sealing of 27 types of polluting industries, in non-conforming areas, began in late November 2000 (see Box 5.2.1). The Court order made it clear that this was an interim step and that the rest of the units operating in violation of the Master Plan, were to be closed or relocated at a later date. On 25 January 2001, it decreed that all 'potentially polluting units would be targeted.

The closure process is thus scarcely complete. At the time of writing this report, a further 33 types of industrial units within the 'F' category of the Master Plan were being sealed. Whether they are all actually polluting is unclear. The Court had asked the government how many polluting units there were in Delhi. In its stead, the government said its survey of 1996 had revealed that there were 38,936 units under the 'F' category, more than 32,000 of which were in non-conforming areas. In the face of opposition from industry, the government has now been saying that they are not all polluting. Whatever the real picture may be, closures are carrying on relentlessly day after day.

In addition, there are thousands of units beyond a certain size that operate in non-conforming areas. A high-powered committee made a classification of industry as per the Master Plan, and proposed the closure of industries operating in non-conforming and residential areas. Following which, in 1997, the Court ordered units in residential areas to close down. Their reported numbers vary greatly. In the hearing on 24 January earlier this year, it was said that a further 57,000 industrial units could close down. Pressurized by the factory owners, the government has been pleading during the past few hearings that residential areas where industry currently occupies over 70 per cent of the area be categorized as 'industrial'. At the same time, it has invited applications from industry to relocate outside Delhi. Hence, besides these widespread closures, there has been a process of relocation that has been inching forward over the last four years or so. Over 52,000 applications for relocation were

Box 5.2.1

Industrial Closures in Delhi

Following a Supreme Court order (of 12 September 2000) that directed the Delhi government that 'all polluting industries of whatever category operating in residential areas must be asked to shut down', teams of sub-divisional magistrates accompanied by police personnel had begun sealing hundreds of 'non-conforming' polluting units. Twenty-seven 'undisputedly polluting industries'—acids and chemicals, dyeing and bleaching, electroplating, glass products, plastic dye, polythene, steel re-rolling, PVC compounds, among others—listed in Annexure III 'F' in the Master Plan of Delhi (MPD 2001) were initially targeted by the government. Over the next few weeks, hundreds of factories in Tri Nagar, Keshopuram, Vishwas Nagar, Rohini, Narela, Samaipur Badli, and numerous other areas were sealed. The official count of industries sealed in this round of closure between November to January 2001 is 2856.

In a matter of a few weeks, according to our estimate, over 4000 industrial units in this city ceased functioning, throwing over 50,000 workers out of work.

When teams from the Delhi Janwadi Adhikar Manch (DJAM) surveyed some of these localities in December, all kinds of economic activity were in the process of winding down. The effects of industrial closure tend to be widespread, having negative spin-off effects in the locality in general, beyond the factory. All kinds of small establishments and the casual, contract, or the informal workforce within them had been hit by closures.

The majority of these migrant workers from villages and small towns in U.P., Bihar, and other states are completely at a loss. When the current round of closures first began in late November last year, thousands of workers took to the streets. It was a scene Delhi has rarely witnessed. Factory owners who needed the workers to add to their protest against closures facilitated these initial protests. Three workers were killed in police firing in Vishwas Nagar on 20 November, but not a rupee's compensation was forthcoming from a single factory owner. Workers and shopkeepers of the area had collected money to send to the families of the dead. Around sixty workers languished in Tihar Jail, as no factory owner wanted to bail them out. There was intense anger against factory owners and particularly against the Delhi government.

Those affected comprise a completely non-unionized workforce given the nature of units and production processes in these areas. In the kind of industrial and ancillary services units that exist in Delhi, there is no security of job. Workers who have worked in a factory for years can be abruptly thrown out of a job. In some cases, they were asked to come back after 3 January (on the day of the next hearing of the case in the Supreme Court) by which time, they were told, the situation would be clearer. Some were told that the factory would reopen on that date. Most were simply asked to leave, or return to their villages. In some cases, workers were physically forced to sign settlement papers by factory owners with the use of goons and by bribing the local police. The workers received just the month's wages due to them. Some received nothing at all since they had taken advances against their wages.

Few have found alternative, even if low paying, jobs in the city. Most workers have returned to their villages, unable to pay the rents for jhuggis in the city. Even, four months after the closures began, those who left in the hope of being called back to work had not still returned to the city. Most workers in fact hail from families that do have small amounts of land, but which is not enough to support the numbers that are dependent upon it. Hence, those affected by these ongoing closures includes not just the thousands of workers in the city, but lakhs of people in the villages and small towns depending on regular money orders from Delhi.

submitted, of which 22,000 units have been approved and deposits paid.

The White Paper on 'Pollution in Delhi with an Action Plan' (1997) brought out by the Ministry of Environment and Forests, Government of India describes the problem as being the 'rise in population and growth in economic activity [which] has led to increase in pollution in Delhi'. Its last chapter affirms that 'the Action Plan goes beyond just controlling pollution'. It also emphasizes 'planning and development of infrastructure which will mitigate pollution'. Towards this end, the objective was to 'contain the pressure of population on Delhi. The [Action] Plan envisages the deflection of a population of 20 lakhs from Delhi. Accordingly, the development of priority [satellite] towns and complexes in the NCR outside Delhi has been projected'. Such efforts had in the past proven counterproductive. For instance, the Master Plan had sought to develop Meerut,

Rewari, Khurja, Rohtak, and Panipat so as to decentralize and decongest Delhi. Not only has Delhi continued to grow and expand, these towns themselves suffer from excessive air, water, and noise pollution. In other words, shifting polluting industries to satellite towns is not a solution but a problem.

But as we discuss later in this report, pollution appears to be an excuse being used to throw workers and their families out of the city (see Box 5.2.2). The Second Master Plan for Delhi (MPD 2001) recommended that hazardous and noxious industries [Annexure H (a)] not be permitted in Delhi. Similarly, heavy and large industries [category H (b)] would have to be shifted outside Delhi to the National Capital Region (NCR). These are the categories and industries that the Supreme Court targeted in its order of 8 July 1996, leading to the closure in 1996 and 1997 of 168 hazardous industrial units, 243 brick kilns, and 46 hotmix plants.

The Master Plan also refers to 'extensive industries', which include 81 types of industries, currently the subject of government attention. Among the closures in 1996 were 847 extensive units in residential and non-conforming areas. According to the Master Plan, new extensive units were to be permitted only in identified extensive industrial areas, of which there are only eight locations: Chilla, Okhla, Najafgarh Road, Mayapuri, Rohtak Road, Patparganj, South of Jahangirpuri, Mother Dairy, and Samaipur Badli. More crucially, extensive units in non-conforming areas had to shift to these specified areas or presumably shut down. It is not clear how these already crowded industrial areas could accommodate these non-conforming units.

Further, light and service industries in non-conforming areas—of which there are thousands—would have to shift to their industrial use zones: those with 20 or more workers within 3 years; those with fewer workers would be reviewed after five or ten years, hence giving them time for relocation. Then, no new industrial unit of any kind employing more than fifty workers would be permitted in Delhi. Finally, only 'household' industrial units with a maximum of five workers and one kilowatt power would be allowed in residential areas, but no polluting unit would be allowed as household industry. This, in essence, is a restructuring of the manufacturing character of the city, for a city of this size would always have small 'household' industry operating, legally or illegally. Anything larger than that in commercial, residential, or other non-conforming areas are scheduled to be evicted (for more on eviction see Box 5.2.3).

The Master Plan refers to 16 new industrial areas for the growing number of light and service industries, but only eight have been developed. Besides, two areas for extensive industries had been promised but none was developed. Of the 58 modifications to the Master Plan from 1990 to 1998 pertaining to 5007 hectares, land use was modified to 'manufacturing' only in four cases, totalling merely 38 hectares. Over the same period, land redesignated as 'residential areas' totalled 2782 hectares, and nearly 200 hectares was changed to 'commercial' purposes.

By lending its institutional legitimacy to this restructuring agenda, the Supreme Court has played a role that is nothing short of dubious. The Court's periodic obiter dicta regarding closure and the accompanying demolition of jhuggi-jhopris betrays its class character. It has referred to the protests of workers against closures in late November as 'hooliganism' having taken over the city. More important than employment, the Court said, was the health of the city residents, a blinkered perspective of health that excludes the well being of those who make the city what it is in the first place. This concern for quality of life places a disproportionate responsibility on those who sell their labour power in order

to secure a life. As one woman in a jhuggi in East Delhi angrily told us, 'We have lived here for twenty years. Delhi was made by our labour, and now they are throwing us out.'

The apex Court believes that migrants, who form the bulk of the city's workforce, will have no objection to moving 40–50 kilometres away. There is, however, absolutely no guarantee at all that there will be a job calling them there.

The silence of the Court on the matter of livelihood of the working class is shocking given that it cannot be unaware of the huge social consequences of the closures of 1996, when thousands of workers were abruptly thrown out of their jobs. In 1996, the Court had at least mentioned some compensation for workers. Expectedly, the actual task of their payment was undertaken only when workers began to agitate for compensation, and even turned to the courts. Yet, the majority of them did not receive anything, because the majority was employed in units where workers were not unionized. Even in large, unionized workplaces—such as Shriram Foods and Fertilisers, with its workforce of over 1350—the Court finally dismissed the case of the contract workers. As a result more than 50,000 workers were reduced to destitution.

Workers and slum dwellers of Delhi as we can see continue to live under a perpetual state of an undeclared 'Emergency' that today derives legitimacy from an active judiciary. On 16 February 2000 in the public interest litigation (PIL) of Almitra Patel, etc., the Court ordered the Delhi government and other authorities to remove slums and unauthorized colonies from the public land threatening to dispossess an estimated 35 lakh people. The Court stated that, 'The promise of free land at the tax payers cost, in place of a jhuggi is a proposal which attracts many land grabbers. Rewarding an encroacher on public land with a free alternate site is like giving a reward to a pickpocket'. Further, 'When a large number of inhabitants live in unauthorised colonies, with no proper means of dealing with domestic effluents, or in slums with no care for hygiene, the problem becomes more complex.' The underlying assumptions link survival needs with the pernicious activity of the land mafia and dismiss the dire need for housing of working people by punishing them for being unable to afford clean living space! It amounts to victimizing the victim, inverting all notions of justice and fairness. Not a word about whether the authorities are obliged to rehabilitate them or not. Equally, there was no concern expressed over lack of sewage, latrines, drinking water, and electricity for the 35 lakhs who reside in slums. Delhi has around 1100 bastis comprising six lakh jhuggis spread over 9.5 sq kms. Most slums are located on land owned by DDA, MCD, NDMC, and the railways, concentrated mainly around industrial areas. The problem of shortage of dwellings, that too affordable dwelling, has resulted in the proliferation of slums. This is

Box 5.2.2
Restructuring the City

Having for years allowed industrial units to thrive in residential and other areas, it needs to be asked why the government and the Court have suddenly woken up at this time to the existence of industries deemed to be 'non-conforming' as per the Master Plan. As it is, Delhi's industrial growth, post-1947, has always run contrary to conforming, regulated industrial development envisaged in the Master Plan. By 2000, the Delhi government declared there were 121,000 industrial units that did not 'conform' as per the Master Plan. During 1980s and 1990s around 4500—5000 new industrial units were added to the city each year, most of them in non-conforming areas, operating with a proxy licence that they renew each year. Currently, besides the 28 designated industrial areas, there are 37 other 'non-conforming' areas in which industry thrives. In fifteen of these non-conforming areas, industry has grown to such a degree that over 70 per cent of it has been taken over by industrial activity.

This proliferation of industry has partly been encouraged by the traditional support of the government to the small scale sector. Another significant factor of this proliferation is the decentralized process of capitalist production. Enforcing the Master Plan's provisions described below and limiting industry by administrative and judicial interventions runs counter to this production system. Hence, shifting industrial units elsewhere does not mean that conditions will evolve into something better. Many will just close down while others will come up in other areas under the same working and operating conditions.

The real agenda may not be to control pollution, but to shift it elsewhere. These actions are directed at altering the manufacturing aspects of the city, to administratively facilitate the removing of manufacturing processes from the city to the degree possible, and transform the city to a centre of service industries.

If one were to view what has happened in Delhi since, a similar pattern emerges. At least 50,000 workers lost their jobs following the closures of over one thousand industrial units in late 1996–7. In early 2000, hundreds of industrial units were shut down following the Supreme Court orders that industries be forbidden from polluting the Yamuna. And in the ongoing round of closures that began in November last year, the authorities have already sealed thousands of units. Many other units had already stopped operating before official teams visited them. According to an official figure, in the hearings on 24 January, the government said that from November to January 2001, 19,496 units had been scrutinized and 2856 units closed, in 1373 units there was no industrial activity, and in 1549 there was change of trade. By any estimate, at least a lakh or more manufacturing jobs have disappeared from this city in less than five years!

A panic has been created about the entry of 'outsiders' into Delhi who are threatening to change the very profile of the city. Their 'illegal entry' has allegedly not only depleted the water and electricity but has also created a law and order problem. It is claimed that only by cleansing Delhi of these hordes of migrant 'outsiders' can normalcy be restored.

'Outsiders' are not the well-to-do white collar executives and corporate but only the working class people hailing from U.P. and Bihar to Orissa and Tamil Nadu who live in sub-human conditions and contribute their hard labour to the building of this city, its upkeep and provide various services. Urbanization necessarily means the movement of workers and others to cities, and there is nothing dysfunctional about it. But high income inequalities, joblessness, slow growth of manufacturing, and even when there is some growth in manufacturing, its poor employment elasticities result in enhanced migration to the cities. Land reforms could have considerably stemmed this outflow from rural areas.

The same State that is today throwing out lakhs of workers and the poor from Delhi was responsible for bringing them here in the first place. The setting up of flyovers, stadiums, and hotels for the Asian Games in 1982 brought in two lakh workers to Delhi. A large section of them remained here as they got engaged in other production processes. They worked in small-scale industries. The 'smooth' flyovers, and 'beautiful' south and central Delhi, and the country clubs, upmarket restaurants and shopping arcades have been built by the very same 'dirty' workers.

The vast majority of migrants who come to Delhi are compelled to live in jhuggies under the most adverse circumstances. Whether it is water, electricity, toilets, or ration, they struggle for each little thing and live in the perpetual uncertainty of losing the little world they have made for themselves. Delhi has a population of over 1.4 crore and of this an estimated 30 lakhs live in 1073 unauthorized colonies. Around 35 lakh people inhabit 6 lakh jhuggies spread over 1100 bastis while there are yet another 20 lakhs in the resettlement colonies. In effect, over 60 per cent of Delhi's population live in areas where there is a lack of basic requirements like proper water supply, drains, toilets, health facilities, or schooling for children. They are constantly prone not only to the vagaries of nature but also most vulnerable to epidemics and diseases. Today the assault on them has mounted. Evictions have become the order of the day.

a reflection of the main problem of an absence of equitable land distribution. In virtually all metropolis in India, nearly two-thirds of the population is forced to live in one-tenth of the urban land. In Delhi, just 1.5 per cent of the total urban land is under slums!

For more than 35 lakh slum dwellers in Delhi, losing their slums would amount to losing their means to earn a

living. This was clearly elucidated in the famous Olga Tellis case decided by the Supreme Court in 1986. The apex Court had then stated that the eviction of pavement dwellers will lead to deprivation of their livelihood and consequently to the deprivation of life guaranteed to every person under Article 21 of the Constitution. This can be guaranteed and ensured by the government if there is adequate supply of

Box 5.2.3
Evictions

During the period of Emergency (1975–7), almost seven lakh slum dwellers were evicted to the fringes of the city of Delhi under the direct orders of Jagmohan, who was the Chairman of the Delhi Development Authority (DDA) at the time. Ever since then, there has been a relentless spate of slum demolitions without giving any notice or compensation to the people. The passing of the Anti-Encroachment Bill in May 1984 in Parliament made the very fact of residing in a basti an illegal act! This strengthened the hands of political parties and the land mafia who work hand in glove at exacting votes, bribes, and obeisance from thousands who live in constant anxiety of losing their housing.

The courts in their eviction orders have cited pollution, beautification of Delhi, or the 'illegal' occupation of land as the reasons.

Six hundred families who were victims of the 1984 Sikh massacres in Delhi, and were yet to receive alternate housing, were evicted again in 1996 from their jhuggies in Tilak Vihar. Entire families sat in protest for months on end at Jantar Mantar to draw the attention of the government to their plight. But they had to give up, when the government decided that Jantar Mantar would no longer be a site of protest in Delhi. On 13 November 1996, the BSF (Border Security Force) evicted 160 families living in the old stables of Pataudi House ever since 1947. Free transport was provided and their departure was recorded on video cameras to record the help rendered by the government while evicting! Tughlaqabad is the last station of the Northern Railways on the track leading to Faridabad. All bastis lying on both sides of the track from New Delhi railway station to Tughlaqabad have either been destroyed or are facing the threat of demolition any day. The predominantly Dalit community of both Thompson Basti and Kasturba Camp were evicted by force for occupying land belonging to the Railways. One hundred and twenty-five out of the 600 jhuggies in Thompson Basti near the New Delhi railway station were earmarked for demolition. On 7 July 1997, the bulldozer razed it to the ground, but Thompson Press is yet to build its beautiful park for which the basti was removed! Both police and the RPF (Railway Protection Force) directed sexual abuse at the resisting women. Some of the residents had returned with a reassurance just 24 hours earlier from the then Prime Minister I.K. Gujral, that the demolition would not take place!

In June 1997, in Kasturba Camp, located on Railway land near the Tughlaqabad station, when the bulldozer was unable to demolish the 1500 jhuggies and the people fought back the demolition squad, the entire area was set ablaze to rid the land of jhuggies. In the process, the adjoining jhuggies on DDA land were also burnt down. People were barely able to retrieve their few belongings. Around the same time, Harkesh Nagar, also located on Railway land on Mathura Road, was similarly demolished. But the slum dwellers of Anna Nagar and VP Singh camp continue to resist demolition. The residents of VP Singh camp near Tughlaqabad, living on the land of both the railways and CONCOR India (Container Corporation of India), are engaged in a legal battle. The 10,000 residents of Anna Nagar located on the same Northern Railway track near the ITO [Income Tax Office] are fighting a legal battle for their jhuggies that the Railways is bent upon taking over.

In 1996, 300 jhuggies of Naya Bazaar in Peeli Kothi in Old Delhi were destroyed with the assistance of police and no alternate housing was provided. In the case of both Rampuri near Janakpuri and Indira camp in Jhilmil, communal tensions were whipped up amongst the slum dwellers to distract them from the immediate demolitions that took place without any prior notice.

Resistance against forcible evictions continues unabated. The residents of VP Singh camp had blockaded the roads leading to the jhuggies in July 1997 and the bulldozers that were scheduled to appear never came. The slum dwellers of Shastri Park, situated between Moti Bagh and Nanakpura on the Ring Road in South Delhi, rained stones on the demolition squads who beat a hasty retreat. Various colonies housing leprosy patients have resisted demolition several times over two decades. In 1986, some of the jhuggies of Jagatmata Kushtashram were demolished. A sustained protest by the people compelled the DDA to rebuild the broken houses. There are several such colonies that have fought for their space in the city. They also include Satyajivan Kushtashram of Srinivaspuri and Jeevandeep Kushtashram of RK Puram.

The last one year has been the worst so far with a series of demolitions taking place on the quiet. Over 15,000 jhuggies that housed around 75,000 people have been demolished. While most of them have not been relocated, the few instances of relocation have forced people to live in even more deplorable conditions akin to a living hell. Around 5000 jhuggies of the Rajiv Gandhi camp near the CGO complex were demolished in early May 2000 amidst fierce resistance by the slum dwellers. Women and children were beaten up and hundreds injured. Only 500 to 600 families were shifted to Modalband near Badarpur. Two thousand families from Haathi Park on Deendayal Upadhyaya Marg who were residing there since 1982 were evicted in June 2000. Prior to this, in February, another 100 families were evicted from the Sadar basti near the New Delhi railway station, and 175 families were evicted in January from Vijay Ghat. Fifty jhuggies were broken in the Okhla village of Jamia Nagar in March. In June, bulldozers razed down 200 jhuggies behind Gagan Cinema in the B1 block of Nand Nagri. Three thousand jhuggies in the Seelampur area were demolished between July to August to clear up space for the setting up of the metro railway project. While only a small section was shifted to Bhalsava, the majority was thrown to the streets. In the same way, 1000 jhuggies were demolished in Shastriya Park near the *Purana Pul-Ka-Theka*. Eighty families were evicted in July from Kisan basti near Chadangi Ram Akhada at Jamuna Bazaar. In February, 300 jhuggies were demolished from Gautam Nagar basti behind AIIMS. Two years earlier, 1800 families were evicted from this same basti. Some of the evicted families were sent to Papankalan. The 200 families evicted from Harijan camp in Masudpur near Vasant Kunj in May 2000 have not been rehabilitated anywhere.

In September 2000, 250 families were evicted from Ravinder Nagar basti near Guru Govind Singh hospital in Rohini. In February, 100 jhuggies in Preet Vihar and 150 jhuggies in Savitri Nagar were demolished without any rehabilitation. In October, around 230 jhuggies from Kushal camp in Jahangirpuri and 250 jhuggies in JJ camp of Shahdara got demolished. Despite wide protests and campaigns again, the month of November witnessed the demolition of 700 jhuggies near the I.G. stadium at ITO. Three hundred children in the basti school and another 600 children in adjoining schools were affected despite a legal plea for a stay on the demolitions until the following March till their school exams could be over. In the same month, another 700 jhuggies were demolished in Gopalnagar near Kingsway Camp. Some of the families from here were sent to Bhalsava. In the same month again, two entire bastis were removed from Lakhi park and C park of Jahangirpuri, which in itself was set up as a resettlement colony some years ago. In January 2001, 150 jhuggies behind the Mata Sundari College were demolished. Sixty jhuggies were pulled down in Dakhshinpuri.

These figures do not represent any final count as the demolition spree continues in Delhi and the majority go unreported in the media. The massive displacement of people to places like Papankalan, Bhalsava, Narela, and Modalbund is no solution because these places lack any basic civic amenities. The plots are not yet demarcated in Bhalsava and people continue to live under tin or plastic sheets in the open and are cut off from any source of work and income. There were slum dwellers from three bastis staying there already when people from another five bastis were literally thrown there to live in similar condition. The arrangement here too is for 10 years only, whereas even in the days of the Emergency slum dwellers were given a lease of at least 99 years.

Slum dwellers have always worked against overwhelming odds to obtain water, electricity, toilets, and of course even work for themselves to eke out an existence. To move out to open fields in remote areas and invest all over again is an enormous burden. Needless to say, these people will put in their labour, money, and time to make the place liveable. As soon as the land becomes habitable, the price of the land will go up, and the pressure on it will increase, they will be thrown out once more to begin from scratch, and always be on the run!

affordable land for mass housing, and grant of tenurial rights to dwellers.

The Court in the present case ignored the earlier judgements⁴² and directed the authorities concerned 'to take appropriate steps for preventing any fresh encroachment or unauthorised occupation of public land for the purpose of dwelling, resulting in the creation of a slum'. It laid down the basis for this by saying that 'the density of population per square kilometre cannot be allowed to increase beyond the sustainable limit. Creation of slums resulting in increase in density has to be prevented'.

Calling slum dwellers 'encroachers' today and comparing them with 'pickpockets' flies in the face of the considered opinion of the very same Court! By bemoaning the inability of the government to clear slums while maintaining silence

⁴² It was the failure of the government to discharge its constitutional obligation that prompted a case in the Supreme Court challenging the demolition of slums in Bangalore (Karnataka Kolageri NS Sangathana & Ors vs. State of Karnataka & Ors). The petitioners contended that the demolitions were illegal as no alternative accommodation was sought to be provided. They challenged the Karnataka Slum Areas Act as being violative of Articles 14 and 21 of the Constitution. It was argued that the slum dwellers had been made homeless because the authorities had failed to discharge their constitutional and statutory obligations to evolve plans for organized industrial allocation around urban areas; for maximum utilization of the potential of land; and for appropriate rural employment guarantees and measures. The failure of the government to evolve a need-based and not wealth-based housing policy was also pointed out. On these contentions, an order was passed in July 1992 directing the appropriate authorities to look into the grievance 'after issuing the notice to both the parties and giving them adequate opportunity of negotiating in a conciliatory manner'.

on the need for alternative accommodation, the judgement clearly shows the class bias of the state.

THE HIGH PRICE OF SURVIVAL

Urban planning in India has always had little if any housing plans for workers and migrant labour. Hence, they create their own homes on public land under flyovers, along the railway tracks, on the riverbed, or in the shadows of skyscrapers. And then these bastis become 'illegal'. All schemes and policies to house them either gather dust or get caught in inter-departmental wrangles or are simply abandoned as soon as they are attempted.

The Delhi Slum Policy announced late last year extended the cut-off line for the regularization or relocation of slums from March 1994 to November 1998. It was projected that almost 10 lakhs slum dwellers could benefit from this extension. Ironically, there are two qualifying clauses that undercut this magnanimity of the state.

First, the government is going to take a development charge from each jhuggi unit! This negates the amount of investment slum dwellers have already made in their existing structures. The 'illegality' of their huts make them victims of local policemen, land mafia, local goons, and municipal authorities all out to extort as much as they can. Right from arranging water and electricity, to toilets in their basti, slum dwellers pay for everything through their nose for not only its cost, but also to appease those who prey upon their condition. In fact, do not slum dwellers have every right to a free house with all basic amenities intact in exchange for freeing up the land for other uses given the current value of the land?

Secondly, while the Delhi government proposes six lakh slums to be regularized, it speaks in the same breath of relocating these slums if required. The link of work and livelihood to one's place of residence is crucial. Most slum dwellers work as vendors, hawkers, sweepers, drivers, and domestics in nearby residential areas, markets, and offices. Relocation to far flung areas amounts to destitution as it deprives thousands of their livelihoods.

In the Bombay Pavement Dwellers Case in 1985, the Court ruled that Article 21 of the Constitution on the right to life includes the right to livelihood, and since the livelihood of pavement dwellers is linked to their place of stay, removing them from the pavements would be tantamount to deprivation of livelihood and therefore unconstitutional as it deprives them of the right to life. Clearly, along with the right to livelihood, every slum rehabilitation has to be accompanied by access to water, electricity, schools, health services, and proper drainage and sewage systems. The living conditions of those rehabilitated in Pankaj, Bhalsava, and Modalbund not only violates every aspect of law but also treats slum dwellers as a 'problem' to be disposed of. Each demolition that takes place with such vengeance in Delhi today is a clear act of abdication by the government of any responsibility or accountability to people.

With every demolition and relocation, children repeatedly discontinue school despite the desperate efforts of parents to save enough to send them to school in the first place. The concentration of Muslims, Dalits, and Other Backward Classes (OBCs) is naturally high in bastis since they form the marginalized sections of society. Since slum dwellers form a crucial vote bank for every party that comes to power, keeping them in perpetual anxiety about their dwelling place is the surest means to garner votes. As long as slum dwellers prove to be a rallying point for electoral parties, any party in opposition invariably raises the question of slum demolitions. But none of these parties, when they are in power, live up to the promises made during elections. Finally, in an increasingly right-wing society, bastis are vulnerable to caste and communal violence. The struggle to survive as a community is frequently torn asunder by communal and casteist interests that thrive on dividing the working class.

THE STRUGGLE OVER URBAN SPACE

Plans, it seems, are violated only by the poor and the powerless. The rich and the powerful simply change them to suit their purposes. The initial norm for a decent living space for the poor in the Master Plan for Delhi, 1962 (MPD-62) was estimated at 80 sq. m per family. This norm was applied in practice in the initial 18 resettlement colonies created by the DDA in the 1960s. As the pressure on land

started growing, this was reduced to 25 sq. m for the colonies resettled after the demolitions done during the Emergency. Subsequently, the National Housing Policy, May 1992 (NHP-92) provided that 'in urban areas, the size of the plot should not ordinarily be less than 25 sq. ms with a provision for permissible built-up accommodation and services on individual or shared basis in a neighbourhood adequately served with community facilities' (MPD-2001, annexure N-5). By stating that the norm should not be less than 25 sq. m, the NHP, without technically violating the earlier provisions, actually reduced it to less than one-third of the original norm. The MPD-2001 provided for 18 sq. m as the norm. In the most recent instances, as in the case of those resettled in Narela, families have been resettled in a mere 12.5 sq. m.

The MPD-2001 itself stated that housing needed to be related to considerations of: (i) affordability; (ii) efficiency of land utilization; (iii) equity (which it defined as social distribution of urban land); and (iv) flexibility. '(T)he most appropriate type of general housing would be partially built housing on individual plots of 70 to 80 sq m.' (Ibid: 121).

In cases where these were not possible, as in the case of economically 'weaker sections', the Master Plan recommends that single family housing could be provided on a reduced size of plots but should have an individual bath and w.c. About the resettlement colonies and unauthorized colonies, it has little to say by way of norms. However, the Plan does provide for 'equity' as an important consideration for Delhi's land-use planning. When this is read in conjunction with the NHP-92, it is reasonable to expect that people should not be uprooted without making alternative provisions.

As per the MPD-2001, the total area of the Union Territory of Delhi is 148,639 hectares (ha) out of which 44,777 ha had been considered within urbanizable limits prescribed in the Plan. According to the 1981 Census, this area accommodates 54.5 lakh urban population. The holding capacity of this land was estimated at 82 lakhs. Since the projections for the year 2001 were that Delhi's population would be 122 lakhs, the proposal was to, firstly, increase the holding capacity of the given area (44,777 ha) through planned efforts and, secondly, to acquire newer areas for urban extension. In the period between August 1990 and June 1998, the DDA has acquired 5007 ha land which has been converted from rural, agricultural, and recreational use for urban extension. Hazards Centre, an NGO, has calculated that 92.5 per cent of this area was located in the new sub-cities of Dwarka (79.2), Rohini (14 per cent), and Narela (5.6), indicating clearly that the proposed housing was, by and large, not for the poor. Narela is the only place where some recently demolished jhuggis have been resettled in tiny plots. In 1998 the DDA proposed an urban extension

area of another 29,761 ha for accommodating a population of 50 lakhs, which is being considered by the National Capital Region (NCR) Planning Board.

The MPD-62, which had envisaged Delhi's urban growth to cover 44,718 ha land, proposed the land-use pattern as in Table 5.2.1:

Table 5.2.1
Land Use Pattern Proposed by MPD-62

Housing	19,182 ha
Commercial use	602 ha
District and regional parks	10,602 ha
Government offices	364 ha
Industries	2347 ha
Warehousing, etc.	304 ha
Educational, research, and other institutes	1741 ha
Circulation	9571 ha

In this distribution, housing constituted about 43 per cent of the total urban land. Of the 14,000 to 20,000 ha of the newer areas that the MPD 2001 planners wanted to acquire, they set aside about 50 per cent for residential purposes. Housing shortage had been estimated by them to be at around 3 lakh units—including squatters and shelterless, as well as families sharing houses in congested areas. About 20 lakh people have been resettled in resettlement colonies covering an area of 1570 ha. There are another 35 lakhs who live in slums or jhuggi-jhopri colonies which cover an area of about 9.5 sq. km. In other words, over 55 lakh people, or about 38 per cent of Delhi's population lives in a tiny proportion of the city's urban area. And most residential areas are reserved for the more affluent sections. Hence, slums invariably come up in industrial areas, railway land, or vacant DDA land. The MPD-62 had in fact, provided for 5 per cent residential area for low-income housing, but according to one estimate even that was not adhered to. This prompted unauthorized habitation (WWF 1993: p. 83).

Population densities vary vastly between areas. In 1991, while the number of people residing in the NDMC area was 6882 per sq. km, the corresponding number for the MCD (urban) area was 16,643. In parts of South Delhi, the density can be 1300 persons per sq. km (ibid: p. 64). The MCD (urban) figures include areas like Defence Colony, Greater Kailash, New Friends Colony, Shantiniketan, Anand Lok, and other such colonies where huge bungalows have relatively few people staying in them. In parts of Old Delhi or East Delhi, on the other hand, the densities are likely to be higher. For instance, in Old Delhi, the average density was approximately 80,000 persons per sq. km in 1981. In one census division it was as high as 166,300 persons per sq. km (ibid). In some resettlement colonies, the density of population was 700,000 persons per sq. km, which is almost 102 times that of the NDMC area. One of the consequences

of the incapability of the successive governments to either plan for the working class, or to develop towns around Delhi as counter-magnets, is the inevitable growth of unauthorized colonies.

The civic amenities provided are woefully inadequate. For instance, according to a recent study (FICCI 2000) about 55 per cent of the households have access to water only outside the colonies (see Table 5.2.2). The rest depend on shallow hand pumps. The quality of water is poor because effluents seep and contaminate the shallow water table, and epidemics are common. A study conducted by the World Wildlife Fund (WWF) in 1993 says that as against the internationally accepted standard of 302 litres person consumes daily (lpcd), one-third in Delhi receive no more than 38 lpcd. Further, the distribution of water is even more skewed with residents of Golf Links and Sunder Nagar getting 450 lpcd whereas the slums, unauthorized colonies as well as re-settlement colonies have to be content with 15–18 lpcd!

Bath and lavatories are available to only 30 per cent of those settled. Poor maintenance and the non-availability of water, along with an user charge imposed, creates a situation where residents do not find it possible to use even these facilities where provided. This is made worse by poor drainage. Only 10 per cent of the settlements have street lights. While illegal connections are rampant, the total power used by these colonies, as per Delhi Vidyut Board's (DVB's) own internal assessment, is no more than 15 per cent of total supply.

In this light, the Union Urban Development Ministry's estimate prepared on the 'positive' fallout of factory closure and displacement of lakhs of workers shows that this would result in an availability of 700 mega watt (MW) of power, 50 million gallons of water per day, as well as reduction of 40 million gallons per day (mgd) of sewage disposal. They also believe that this would result in saving Rs 240 cr of revenue loss incurred by DVB because of illegal use of power by units located in residential areas. According to them, this would suffice to provide water and electricity for the new housing suburb coming up at Dwarka which will house 10,000 families. In other words removal of 15–20 lakh workers and their families would help provide for 45,000 people!

As for housing people, there is sufficient urban land available in and around Delhi to provide affordable and clean shelter. Nearly 35 lakh people live in just 1000 hectares, which is but 1.5 per cent of the total urban area of Delhi. Most of this land is public land. It is perfectly possible in the name of 'greater public use' to use this land for housing the poor.

It requires no more than 4–5 thousand ha to provide shelter for 2–3 million persons with a unit size of 75 sq.

Table 5.2.2
Area under Squatter Settlement in Delhi (as of 31.4.94)

Zone	No. of jhuggies	Land area in sq. metres
Central	50,286	1,006,880
East	66,798	1,353,440
North	120,559	2,413,120
South	123,957	2,480,800
West	96,866	1,938,280
Other	15,592	311,920
Total	4,74,058	9,504,440

Source: FICCI (2000); based on data provided by the Slum and JJ Department, MCD.

m, which is the minimum required for a family unit. Thus, the current density per acre could be reduced by two-third. Those removed can be provided shelter by acquiring just 3000 ha. This land is already available with the DDA, which, during 1990–8 acquired 5007 ha for urban extension. In fact, if the apex Court as well as the Union and Delhi governments are sincere then some of the land acquired in Narela, Bawana, or Rohini, where industrial units are supposed to be located, can easily be developed to provide affordable and clean shelter. Besides more land can be made available by taking over 68 per cent of the land lying with units closed by the Supreme Court in 1996. Rather than demolishing jhuggi–jhopri colonies, the public land on which they stand can be justifiably used to house the urban working class population. Surely this is in accordance with the principle of ‘greater public good’.

No solution would make sense if these shelters come up without proper water supply, toilets, sewage and drainage systems, schools, medical facilities, and transport links. The existing problem of power and water can also be resolved by an equal distribution of these resources. Surely, reducing the consumption of water for the affluent can enable slum

dwellers to receive more. In addition, the improvement in sewage facilities can transform slums into clean and healthy colonies. In this way, slums can cease to be the eyesore that upsets the rich so much that they want to wipe them out completely.

The following fundamental question must be raised: don't the poor and working class have a right over the air and water of our land? We have to challenge the very path of development that has alienated the poor of this country from its abundant natural wealth while a handful of people have established their control over it. The motto of ‘clean environment’ is also a struggle for equal rights over our resources. Without that, the slogan of environment would only strengthen the hands of the powerful, as is evident from the politics around the Supreme Court orders (see Box 5.2.4). Ultimately it has to be a question of the struggle to end exploitation.

In 1994, there were 4.8 lakh dwelling units (each unit with 4.5 persons, totalling 2,164,180 persons) in a total land area of only 9.5 sq. kms. The total urban area of Delhi is 625 sq. kms. In effect, the total area under slums is no more than 1.5 per cent of the total urban area of Delhi!

Box 5.2.4
Who Are The Land Grabbers?

Land is simply not the problem. Had that been the case, the government would have acquired the land that it had got vacated by industries in the first round of closures in 1996. The Joint Action Committee of Textile Workers' Unions of Delhi calculated the value of land occupied by displaced and closed industries on the basis of 32 per cent of the land given to them for commercial development with a 100 per cent Floor Area Ratio (FAR). In the event, 32 per cent of the total area of 162,135 sq. ft is commercially developed, Birla Textile was to generate a profit of Rs 340 crores. The government share would have been approximately Rs 700 crores, according to the land-use package ordered by the Supreme Court. Similarly, Swatantra Bharat Mills and DCM silks were to generate a profit of Rs 700 crores from 441,161 sq. ft and Ayodhya Textile Mills a profit of Rs 225 crores from 1,045,440 sq. ft of land. In these cases, the government share would have come to about Rs 1500 crores and Rs 500 crores, respectively. If the government wanted to really use the land for developing lung spaces as directed by the Supreme Court or for any other purpose, this should have been its priority before it went about displacing ordinary working people.

Box 5.2.5
Life at Relocation Sites

BHALSAVA

Bhalsava is four kilometres from Alipur Chowk in north Delhi, approachable by a metalled road from Outer Ring Road (near Jahangirpuri) that takes one to what is commonly described as Bhalsava dairy. Here is flat, open ground devoid of trees or shade, open on all sides to the elements. Beyond the houses of the local farmers lies the area where 20,000 people have been left to fend for themselves. They have been dumped here after the jhuggis they stayed in were demolished, in areas as far away as Garhi, Gautampuri (near ITO), Pashchim Vihar, Sanjay Camp (Rohini), and Ashok Vihar. And many more are slated to be brought here from demolished JJ clusters elsewhere. All those brought to Bhalsava had been staying in their area they were brought from for over ten years.

The process had began on 3 November 2000 beginning with Garhi. The most recent to be dumped here are people from Sanjay Camp, brought here on 3 April. They were all assured, prior to being shifted, that they were being taken to an area that was developed with all facilities provided. Not only was this not true but the little that has been made available to them was the result of their protests.

The land had not been levelled, no drainage has been provided. The soil retains water, and as a result the area becomes muddy and slushy with the slightest downpour. Since there is no sewage system, the pits dug by people to dispose used water get mixed with the downpour, making one big slush. People live under plastic and cardboard 'shelters'.

Before being brought here, people were asked to fork out Rs 7000. The 'receipts' given to them mention this as the 'amount received towards security and license fee for 10 years'. The same also referred to the plot to be provided to them. The size of the plot varied from 12.5 to 18 sq. metres. That is barely enough to provide a room or two. Not everyone who lived in the JJ cluster could raise this amount. Many borrowed at exorbitant rates of interest.

Even then, there are many who still await the allotment of plots after having paid the money. Since the soil is porous, each plot owner had to spend up to Rs 15,000 just to dig and then fill it up to be able to build a house over it. This is to prevent seepage. When that is done another Rs 35,000 is required to build a 'pucca' house. Not many have the savings or the borrowing capacity to raise this amount. Thus, even where plots are demarcated, there are raised platforms that stand forlorn.

There is no drinking water available. The water provided is salty, and therefore its use even for house construction is risky. The DVB has a supply centre and street connections are there, but power supply is erratic.

The nearest hospital is Babu Jagjivan Ram hospital in Jahangirpuri. There is a dispensary in block D1. Only two primary schools have been set up, in tents (in block A2 and D1). These temporary schools have classes only up to Class 5. The older children have to travel to their earlier schools spending Rs 20 to 24 each day. The prospect of continuing school in the next academic year seems bleak for several families who somehow managed to get their children to sit for their final exams this year. The children had to prepare for exams under candle light and are plagued by mosquitoes. As a result, many have discontinued their studies.

Instead of the ration price of Rs 9 for a litre of kerosene, they pay Rs 15; for sugar, instead of Rs 14 anything between Rs 16–18 per kg; for atta Rs 8 as against Rs 7 in ration shops; and finally rice costs them Rs 12 per kg as against Rs 10. What is more, the price of fuel made out of dung (*gobar ke uple*) has more than tripled because the local farmers realize that the people have no choice but to use it both for fuel and as a mosquito repellent.

Travel costs of families living here have gone up considerably several times. Bhalsava to Paharganj, up and down, costs no less than Rs 16. The only other option is to board connecting buses from Jahangirpuri. Jobs are scarce in the area, with no industry and little commercial activity of any other kind, and therefore everyone has found their earnings slump. Daily wagers and rickshaw pullers barely manage to get work for even 15 days a month.

MADANPUR KHADAR EXTENSION

This is actually part of the village Madanpur Khadar behind Sarita Vihar. In January 2001, the DDA resettled several families from Ambedkar Colony jhuggis near Nehru Place bus depot. Most families hail from Bihar and U.P., and many had been staying in Ambedkar Colony for years, some for over 20 years.

The DDA charged Rs. 7000 for 22 sq. metre plots and Rs. 5000 for 12 sq. metre plots. People had to invest in even leveling this highly uneven land. For a 12 sq. metre plot, three truck loads of material is needed at Rs 300 per truck, or Rs 900 in total.

People have not been told how long they can stay here. They only have a xerox copy of the drafts they deposited with DDA without any receipt or any idea of the duration of the lease. To try to prevent the transfer of allotments of jhuggis, the application form also had to contain a photo of the residents. Also, the DDA officials told them they would get no papers for at least five years to prevent them from selling the plots. But most perturbing is the absence of any idea of security or certainty of residence.

Madanpur Khadar is far away from their earlier places of work. The bus to Nehru Place takes a circuitous route and hence is Rs 8 one way. Along with the connecting bus to their place of work (many work in Okhla and Gobindpuri), transport fare can be Rs 20 to Rs 24 per day per person. Some have had to give up work due to the difficulty and expense of commuting. At night, the last bus to this place is at 7 p.m. Anyone who comes after that would have to walk long distances. Even those children who used to attend school still travel to Nehru Place. Though there is a government school nearby, the children could not be admitted

because they have been unable to get the ration cards for identity. Ration cards are yet to be issued with the new addresses. Those who go to school still have to go to their old government school. Even rations are still procured from Nehru Place. Women trudge there on the first day of each month and get the month's provisions.

There are drains lining the jhuggis, but the drains are uncovered, shallow, and narrow. In the monsoons, the drains would definitely overflow all over. The built-up structures of the houses ought not to cover all the floor area, but given the smallness of the 12 sq. metres plots, the houses occupy all the land given. Hence, they are very close to the drains just outside. No electrical power has been provided officially. There are three contractors in this jhuggi who supply electricity, at the rate of Rs 150 per point per month. Hence, those who ask for one bulb and one fan connection have to pay Rs 300 a month. This is a very high rate for the level of power consumed. We were told that the contractors deposit a lakh of rupees with the DVB, and recover their money through the jhuggi dwellers. Hence, those in the DVB and middlemen profit greatly from these jhuggi dwellers. A tanker comes in the evening. A few have installed hand-pumps, but the water is hard water, unfit for drinking. There is a row of mobile toilets at one end of the settlement, but few use that. Most go out into the fields.

There is also the complete absence of any health services for miles around. The fly ash emitted by the chimneys of the NTPC's (National Thermal Power Corporation) Badarpur Thermal Power Station on Mathura Road is a continuous nuisance. It is also a dust-prone area with lots of construction taking place in the vicinity.

Both Bhalsava and Madanpur Khadar are transit camps since the arrangement is valid for only 10 years (several respondents said five years) whereas even in the days of the Emergency slum dwellers were given a lease of 99 years.

5.3 RAILWAY SLUMS IN MUMBAI

Prem K. Kalra and P. Nandini Kumar

Slums create many problems both for the governments whose land is illegally occupied and for the slum dwellers living in a state of uncertainty and an appalling living environment. Eviction, resettlement, and slum improvement are possible approaches to the problem, but none of them have a universal application. The local situation is very important in the design of a solution. It makes sense to go beyond formal ownership to recognize the 'rights' of squatters and go ahead with a pragmatic approach. The basic root causes for the existence and creation of slums are low labour absorbing industrial growth, poor growth, and high inequalities. Similarly, vast distortions in the poor's access to residential land in the bigger cities, not only due to unaffordability, but also because of land use plans that provide little allocation for the poor's housing, have been important in creating slums (see Section 5.2).

Eviction assumes that the slum dwellers are illegal occupants of the public land and hence have no right to stay, and hence should be evicted. This approach ignores the fact that the problem arose primarily because of the lop-sided policies and laws framed ignoring ground realities. The only 'advantage' of such a policy is that it provides strong disincentives for those who try to occupy new lands and form slums.

Resettlement seeks to shift slum dwellers to less valuable land, often on to the outskirts of the city (where less centrally located land is available), and provide them with the basic infrastructure. A likely problem with this approach is that the beneficiaries cannot find work in the outskirts of the city. Relocation when accompanied by schemes to build

reasonable housing could work when the outskirts have much economic dynamism. Inadequate investments in public transportation restricts the scope of this approach.

Slum improvement accepts the de facto position that the land has been occupied, often for decades, and tries to legalize the existence of the slum dwellers on it and improves the infrastructure thereon. This is probably the most beneficial for the slum dwellers, but has the danger of encouraging formation of more slums. Indeed, if incomes of slum dwellers do not rise sufficiently for them to be able to 'afford' a dwelling, they could rent out the same and occupy other lands to create new slums!

GENESIS OF THE MUMBAI SLUMS

The city of Mumbai, India's premier city today and with continuing natural impetus for growth, attracts large numbers of people every day from almost all parts of the country. During the 1960s and 1970s, the immigration, both from within Maharashtra and also from other parts of the country, especially from areas known for drought and poverty with few employment opportunities, has been particularly large. Land in Mumbai has been almost entirely out of the reach of not only the poor but also the middle class as well. Even the upper middle classes find it very difficult to buy a house or flat in Mumbai.

Resettlement and Rehabilitation Policy

In the early 1990s, the World Bank decided that no project could be cleared without the resettlement and rehabilitation

component. This policy change had an impact upon the Mumbai Urban Transport Project-II (MUTP-II). The Government of Maharashtra (GOM) had to formulate a Resettlement and Rehabilitation (R&R) Policy. A Task Force was appointed for this purpose whose recommendations formed the basis of the MUTP-II resettlement and rehabilitation programmes.

The MUTP-II was to be based on (a) minimization of displacement; (b) full compensation to the displaced prior to actual shifting; (c) active settlement, and as far as possible retaining existing community networks. It also stressed the need to involve NGOs in resettlement.

Mumbai Urban Transport Project (MUTP)

To address the problem of ever increasing traffic, which the existing railway system was unable to cope with, the MUTP was started with the help of World Bank by the state government. The first phase of MUTP (MUTP I) worth \$25 million, was funded by the World Bank and consisted of introducing an additional 700 buses, constructing three flyovers at important road intersections, construction and improvement of five bus depots and part of a major workshop for Bombay Electricity and State Transport (BEST), and installation of new microprocessor-based traffic signals at 77 junctions.

The second phase, called MUTP-II, envisages replacement of level crossings with road over bridges, signalization and traffic management, subways, road improvements, new roads, additional bus transport and improving the suburban railways. For implementation of rail projects under the MUTP-II, a separate corporation for suburban railways called Mumbai Rail Vikas Corporation (MVRC) has been created as a joint venture of Indian Railways (IR) and the Government of Maharashtra.

Mumbai Rail Vikas Corporation

The Mumbai Rail Vikas Corporation (MVRC) has a share capital of Rs 25 crores in the ratio of 51 per cent and 49 per cent between IR and GOM. It planned to implement 12 important rail projects worth Rs 4741 crore. Another Rs 400 crore project for rehabilitation and resettlement of 22,000 slum families was to be worked out to resettle the project affected persons.

The Problem of Railway Slums

Workers immigrating into Mumbai in search of employment found empty railway land on either side of the railway track and started putting up their dwellings on this land. Railway lands had been leased by the state government to railways or were owned by the railways. Over a period, these developed into full scale slums. About half of Mumbai's population

lives in such slums without basic facilities like adequate water, electricity, and sanitation, and of course with no legal right over their dwellings.

The policy of the government towards these slums until the 1970s has been that the slums being illegal, the squatters have to be evicted. The policy did not work as the evictees always managed to find another area to settle.

The slums occupied this 'spare land' meant for expansion, and blocking growth of the network, badly affecting the city's transportation. The adjoining railway tracks became open latrines, creating health hazards, an overpowering stench, and what is worse, increasing the probability of accidents. The frequency of the trains passing on these tracks is so high that the slum dwellers have to cross the tracks even when they find the train approaching. Almost every day, one or another slum dweller is killed while crossing tracks, often resulting in the motorman being assaulted by angry mobs. The trains slow down substantially near slums to avoid such accidents. Where the slums are closer than 30 feet from the tracks, the safety commissioner of the railways requires trains to reduce speed to 5 kmph. There are 11 to 15 such points on the Mumbai metro rails. The reduction in speed, in turn, reduces the number of trips a single rake (an articulated set of coaches) can make in a day, effectively reducing the number of available trains to the growing population. This results in further overcrowding of the local trains already bursting at the seams.

Confronted with these problems and the need to free railway land to expand the services, some success was achieved when several organizations came together to solve the problem. Complete clearance is yet to be achieved, but there are notable successes. The key elements of the approach included: the state government identifying and providing land for resettlement; railways helping to develop the land; the municipality providing the offsite infrastructure; twenty two cooperatives of slum dwellers doing design, construction, and financing; and HUDCO (Housing and Urban Development Corporation Ltd.) giving loans to cooperatives and individuals through NGOs such as the Society for the Promotion of Area Resource Centres (SPARC), National Slum Dwellers' Federation (NSDF) and Mahila Milan.

Organizations

The residents of these railway slums formed themselves into an association called the Railway Slum Dwellers' Federation (RSDF), which is affiliated to the NSDF. The RSDF has been quite active in articulating the needs of the slum dwellers and negotiating in all resettlement programmes. It has also been instrumental in getting the support and cooperation of the slum dwellers for such programmes.

The SPARC is a registered voluntary organization established in Mumbai in 1984 as a vehicle to explore ways for city governments to work with poor communities through

partnerships. Today, SPARC is active in 21 cities throughout India.

Mahila Milan ('women together') is a network of collectives of women who come together to share experiences to gain recognition in their settlements. It took an active part in the railway slum rehabilitation programmes.

The NSDF is a national organization of leaders of slums in India set up in 1974. The NSDF focuses on securing *land tenure* and *basic amenities* for its constituents, and organizes them in the cities where they reside.

THE STORY SO FAR

Bharat Nagar

Railways wanted to extend the Harbour Line across Thane to Belapur but there was an illegal settlement of 800 to 900 households on the railway land called Bharat Nagar on the land. All these households were offered government built houses a short distance away for Rs 58,000 each, and all but 150 households who could not afford to pay accepted the offer and moved out. These 150 households were moved to a transit camp and given a piece of land on which they would develop their own houses. They formed the Jan Kalyan Co-operative Housing Society and planned and designed houses of SPARC who arranged for loans at low interest.

Borivili

In Borivili, 700 families were living within 30 feet of the railway tracks. This created the problem of safety for the slum dwellers and low speed for the railways. As a result of negotiations between the RSDF and the Railways, the RSDF convinced these 700 families to move 30 feet away from the track. A wall was built at 30 feet on either side, and the 700 families moved *en masse* to neatly laid out plots beyond the 30 feet limit, which developed into a railway slum colony called Pushpa Vihar. This project met the needs of both Railways and the slum dwellers. Trains were running at full speed while children could play safely beyond the walls. After this experiment, 135 families in Bhandup and 100 families in Vikhroli moved 10 feet away from the tracks in a similar exercise.

Kanjur Marg

The Government of Maharashtra decided to lay the 6th corridor—a strip of Central Railway between Kurla and Bhandup—as a part of the MUTP. The RSDF conducted a survey and found that there were 1910 households in the area. The state government found land nearby to accommodate 1200 households with the idea that as the work progresses, new land would be found for the remaining slum dwellers.

The railway slums of Mumbai are one of the toughest problems to overcome and the gain in allowing the Railways to expand is enormous. The lessons are clear and would have been obvious to anyone with a pragmatic bend of mind.

Accepting slums as a reality, regardless of their illegal status, seems to be the only way out in many situations. A substantial section of the city's population live in slums and cannot be expected to 'vanish into thin air'. The slums grew in cities in the first place because of defective urban planning which ignored the existence of the poor. The slum dwellers themselves do not like living in slums but live there out of desperation. Given a chance, they would rather invest their savings and get a legal permanent structure and lead a safe and more respectable life. Policies like eviction, however, push them to the wall and they either rebel or resettle in some other area. Any process of resettlement and rehabilitation can only be in consultation with the slum dwellers. Transferring them to an area far away from their place of work would not help either, since most women also work in these poor communities. A servant maid or a vegetable vendor, for instance, has to live near middle class localities in the city to attend to work early in the morning. The other large incentive for eliciting their co-operation is legal holding of property, which appropriate resettlement can ensure. Better infrastructure at resettlement sites improves the quality of their lives.

More often than not, NGOs are less insulated from and more in touch with the ground realities than government agencies. The slum dwellers tend to talk more openly with the NGOs and express their difficulties. Slum clearance of the variety discussed here is pragmatic, and the gains in such an approach being able to break the gridlock are immense.

5.4 POWER PROJECTS DEVELOPMENT: REVIEW OF SOCIAL AND ENVIRONMENTAL ISSUES

Binayak Rath • K Ramakrishnan

Over the years, the resistance to displacement of population due to power projects has been increasing because of rising

activism both at the political and non-governmental levels. The international funding agencies, such as, the World

Bank, Asian Development Bank (ADB), and others have started demanding detailed consultations with and involvement of those who are directly affected, right from the conceptualization stage of the projects. They have also put pressure on the central government, the concerned state governments, and the developers of such projects to work towards more committed proposals on resettlement and rehabilitation (R&R) to the fullest satisfaction of project affected persons (PAPs). The heightened concern about the displacement of people and other associated issues are adversely affecting the growth of the sector. This paper first examines the environmental and social issues that are faced by the power projects and then suggests a more effective manner of implementing the R&R activity.

ISSUES IN THE DEVELOPMENT OF POWER PROJECTS

While thermal power projects are normally set up at pitheads of coalfields, hydro power projects are set up at locations where the topography is suitable for a high dam, such as at the source of a river/stream. Thus, most power projects are generally located in remote rural areas. Land is normally acquired in the name of public purposes/interest through governmental action. The acquisition of land for the projects always involves considerable complications due to structural problems associated with the land. The revenue records are invariably out of date. The land value shown on the records is invariably much less than the market value due to well-known and established reasons. In addition, there may be more than one claimant for a given parcel of land. Many a time, the government as well as the Forest Department also lay claims on plots of land that are in the possession of the individuals.

The provisions contained in the Land Acquisition Act for fixing compensation usually leads to conflicts and legal battles. The rate for forest land is normally fixed at a high level by the Forest Department. Since it involves transfer of funds from one government department to another, generally there is no dispute over the price. However, in many cases the prices for fertile agricultural land of the poor farmers are generally fixed at rates that are unacceptable to the project affected families (PAFs). In recent years with increased awareness, active participation of NGOs and social activists, the acquisition of land and involuntary displacement of the people are facing increased resistance. However, neither the governments nor the project developers are still willing or able to propose viable and practical solutions, so that the development of the project not only meets the intent for which it is set up but also ensures that the life of those who are directly adversely affected by the location of the project is better than before, that is, the fruits of development also touches project affected families.

Power projects always affect the physical environment of the surrounding area. In addition to loss of flora and fauna due to land acquisition, a coal based thermal project generates a large amount of ash—it is said that a thermal plant in India produces ash, and power is merely a by-product. Indian coals are among the worst in the world with as much as 40–5 per cent ash. The ash generated in rural areas could possibly be utilized effectively for landfills, for construction of roads, and for development of wasteland. However, in and around cities, it only adds to atmospheric pollution. Thermal projects also pollute the water bodies in the vicinity of the project due to mercury/heavy metal (from coal) contamination. Hydro projects raise the issues associated with submergence of huge areas of forests and physical habitats. In spite of these adverse environmental impacts, there is little effort to search for cleaner but costlier modes of generating power because of the low value attached to the degradation of environment.

Though land is a productive asset (possibly the only one with the rural poor), the compensation offered is invariably lower than its true value. Delays and arbitrary settlement of land acquisition usually sow the seeds of future problems and complications. Moreover, one time lump-sum payment for the land leads to the cash being frittered away causing deprivation in the future. The meagre amount paid to the land oustees (LOs) as compensation is consumed and not invested in productive assets that can generate income in the future. The difficulties faced by those whose land is not acquired but who live in the same village or in the vicinity are even worse. They do not get any benefit but suffer the negative impact of the project. The statutory techno-economic clearance as suggest by the Central Electricity Authority (CEA) overlooks the costs that a project could incur in taking care of the environment—physical and socio-economic.

In addition to the above difficulties, the developer of a power project faces several difficulties arising from reasons that include the following:

- the multiplicity of government agencies that he has to deal with for obtaining the requisite clearance;
 - reluctance of financiers to fund the project without statutory clearances and reluctance of government agencies to give statutory clearances without financial closure;
 - cost escalation due to delays in obtaining clearances;
 - unreasonable demands from project affected people;
- and
- interference from local small-time politicians.

The government has been bringing out new guidelines/regulations governing the environment from time to time, in particular since the early 1990s. These steps have generally been more in reaction to events and to pacify critics, than

to meet the genuine needs for a pragmatic and integrated view of large development projects. Some of the measures have led to impractical and even impossible requirements being placed on the projects. An illustrative list of the 'impossible' regulations is land for land, providing jobs to all or most displaced people, controlling pollutants to advanced countries' standards, and 100 per cent ash utilization. Such requirements have caused the need for costly and imported technologies to mitigate the effects and acquisition of more land with consequential effects on the costs of the projects. As a result, the tariffs have been pushed up. The time has come to review the stringency of these regulations so that development does not suffer.

In short, power projects, perhaps like all other large developmental projects, face enormous hurdles arising from archaic and apathetic governmental procedures and legitimate concerns for environmental degradation and the impact these projects have on the economic and the social fabric of the project affected communities.

MITIGATION MEASURES

The progress of development projects has been adversely affected over the past several years due to 'extreme' positions taken by those who oppose the current form of development. In the early years of independence, the civil society did not get involved in issues arising from the setting up of development projects. In the last few decades, however, the various movements against one development project or the other have succeeded in focusing attention on the costs borne by those affected and displaced, and served to considerably change the attitude of the government as well as the developers and other stakeholders to improve the rehabilitation packages. These movements have, however, degenerated into aggressive environmentalism, based on exotic ideas that ignore the local realities and the desperate need for fast paced development for a poor nation. The combination of democratic rights and the gullibility of the poor has become a potent weapon in the hands of these activists to slow down, if not stop, development projects. Governments in democratic societies find this opposition difficult to handle. The best way to handle the situation is to ensure that environmental, economic, and social issues are adequately addressed right at the conceptualization stage, in consultation and association with all stakeholders, the local community and PAFs, NGOs, activists, and the local governments. This process of consultations and dialogue between all constituents should be maintained throughout the life of the project.

Involuntary resettlement not only engenders feelings of alienation and helplessness, but also tends to adversely affect the prevailing social and economic cohesion. Many a time,

projects taken up as rehabilitation measures are not in conformity with the local values and extant systems. Hence, they fail to achieve the desired objectives. Government too tends to push all the consequences of land acquisition and the responsibilities of R&R solely on to the project developer. This is not effective since the government is possibly in a much better position to ensure success of rehabilitation efforts than a private developer. Besides, a large project typically generates impacts that have far wider ramifications. If this is recognized, then there could be other ways of mitigating the negative impact on the local communities.

Institutional development is necessary to ensure that development projects meet the objectives. There is no articulated institutional developmental strategy in the country within which the development projects can be planned. Currently, the institutions that are in existence suffer from shortages of staff with necessary skills and experience. The institutional framework also suffers from absence of effective management control systems to evaluate the outcome and performance of people oriented activities. Project developers in India have a tendency, possibly in connivance with the local leaders and local government, to avoid measures to fully mitigate the impact on the physical and social environment. The participation of overseas equity institutions and banks has improved the institutional structure and has generally made the Indian organizations respect the statutory and institutional requirements to protect the environment and the interests of project affected people.

The knowledge and skills available with the regulatory agencies (currently, largely governmental agencies) to deal with the complex issues related to EIA (Environment Impact Analysis) and SIA (Social Impact Analysis) studies in a pragmatic and cost-effective manner are extremely limited. The policies formulated and implemented to mitigate the negative impact on the environment and the economic and the social fabric of the region are therefore many a time quite inadequate. Another issue that remains inadequately addressed by policies is the disparity that is created between those affected and those who are not affected by the project.

Another major issue in R&R today is the problem of high and inflated expectations. The expectations today may be a backlash of the years of neglect. However, increasingly they have become far more than what can be reasonably met by a project to remain economically viable. Costs, when firmed up at the feasibility stage can be dealt with, but the increasing uncertainties and delays may cause many developers to take steps to avoid the responsibilities. High quality R&R programmes are currently not on the agenda of the heads of the projects. This is essentially because generally the performance of a project head is judged by the yardstick of efficiency in the operation of the plants and not by the efficacy of the efforts to address the concerns of rehabilitation and resettlement.

BUILDING A FRAMEWORK FOR R&R

Projects are increasingly being influenced by the cultural orientation of people directly affected by it. Projects now focus on solutions not only to the technical problems, but also to the social issues. Any abatement measure, imposed on or adopted by a developer, has to be practical, feasible, and desirable. It should not and cannot be a substitute or a replication of governmental efforts in rural development. Projects have to ensure that the improvement in the standards of livelihood of the projected affected persons is at least proportionate to the extent of impact the project has on such people. However, given the endemic shortages in our country, there is a larger society beyond those directly affected by the project whose interests too have to be considered. If the efforts to help the project affected persons impose a more than necessary burden on the larger society or create disparities with the neighbouring society, then more problems are likely to be created in the long run. There is therefore a need to evaluate various demands and costs more holistically. What is required is a paradigm shift from government diktats through legislative requirements to one of consultation and working in an integrated manner. This calls for a multi-pronged approach, one driven with a missionary zeal. While organizations have to accept that it should be a mission of the organization to resettle and rehabilitate the people in an equitable and fair manner so as to help improve the quality of those involuntarily affected, it should equally be necessary to keep in view the requirements of the larger society while determining the expectations on the developers.

In our suggested framework, the developers are seen as facilitators and not as providers of the services required for R&R of the PAPs. It would be more appropriate for the developer to provide funds for the same purpose to a 'service provider' who is qualified, approved, and registered with the government agencies to take up such services. The service provider should undertake the R&R activities in a professional manner in collaboration with the PAFs/PAPs and NGOs. A specified percentage of the project cost should be set aside so that project developers know their costs and accordingly decide on the viability of the project. While a part of this corpus could be used for initial expenses and investments, the balance could be kept aside to meet recurring expenses. This can be used to sustain the families while they are being trained or empowered to obtain sustainable/alternative employment.

The required services should flow through various arms of the state in collaboration with the developers. More attention needs to be paid, both in the institutional design as well as actual working, to ensure effective maintenance, conservation, and improvement in the facilities provided during the lifetime of the project. Once these are

institutionalized with the active involvement of PAPs, the chances of success will increase and the benefits will reach a larger segment of the population.

The framework also ought to define the role of NGOs and other voluntary bodies, which get involved in any project. Their skills are put to proper use—as watchdogs of the policies and programmes. The NGOs should also play a major role in eliciting the commitment, support, and active participation of the local communities and affected families. They should also be involved in capacity building of PAPs to deal with the changes brought about by the project.

Involvement of the staff of the organizations at all levels is one critical aspect in ensuring efficacy of the mitigation measures adopted. Various functional specialists should be involved to create better awareness across the organization on what is at stake for the organization. This single step will go a long way in ensuring reduced tension between PAPs and the personnel of the project and hence the developer. Currently, more often than not, the two adopt adversarial postures, since the project employees feel that the problem is not their creation but they are there to just do their jobs, whereas to the PAPs, the employees are seen as representatives of the developer and all their frustration are hence directed against them and their families.

RECOMMENDATIONS FOR EFFECTIVE R&R

Based on the discussions thus far, we suggest the following framework for improving the effectiveness of the resettlement and rehabilitation activity associated with large development projects:

- The developers' ought to see the R&R efforts as a commercial opportunity and as an opportunity to serve society. The removal of uncertainty about the costs of R&R by freezing the funds commitment at the start of the project would go a long way in changing the mindset.
- The monitoring mechanisms for both the physical and social environment should be institutionalized. Involvement of PAPs and NGOs should be formalized through a fair system of seeking their representation.
- The facilitators and NGOs should work together to change the attitude of PAPs to a participatory one rather than one of confrontation. The current attitude of PAPs of total dependence on the government and/or on the developers should change to one of self-sustenance and self-support, of course, with the requisite assistance from the developers, the government, and the NGOs.
- The fact that all projects take up large-scale plantations as part of the measures to protect the physical environment can enable them to create sustainable employment for selected and needy PAPs in the rearing of trees.

- Since fuel is a major constraint in the rural areas, this is one requirement the projects should address directly. This will be much more desirable than provision of electricity, which in any case is a relatively high cost resource and should necessarily become an input to PAFs only after other basic inputs such as health care, drinking water, education, and sanitation are made available.

- It would be wise to allow the PAFs to participate actively in the design and construction of their new habitats, particularly their personal spaces. The new habitats should contain basic common facilities such as school, health care, water supply, sanitation, and approach roads. It is generally found that most are willing to pay for better services. The PAFs should be trained in management of the common facilities created as a part of the R&R efforts by adhering

to the principle of recovering legitimate charge from the users of facilities for maintenance and enhancement of the common facilities.

- The PAFs should be educated and trained by NGOs to contribute to the betterment of the environment. They should be motivated, if necessary through use of monetary incentives to seize the opportunities to have sustainable development rather than merely look for immediate gains or benefits.

- Finally, the government policies and regulatory structures should be re-examined so as to make them pragmatic and development oriented. The emphasis should be on evolving regulations that ensure that large development projects are commercially viable as well as acceptable to the people.

5.5 THE CNG VEHICLE PROGRAMME IN DELHI

B.P. Pundir

In India, the first serious measures to control vehicular air pollution started in April 1991 when emission standards for the new passenger cars and two and three wheelers were brought in. These were followed by the emission standards for new diesel vehicles in 1992 and the progressively stricter emission standards were enforced starting from the years 1996 and 2000. In the year 2000, emission regulations were similar to Euro I norms. The Ministry of Environment and Forests, Government of India had recommended these emission norms, and they were notified by the Ministry of Surface Transport, Government of India. The government was discussing still tougher emission norms on the lines of Euro II, III, and IV. These were to be brought in phases over the period from 2002 through 2007. However, some environmentalists perceived that the government was going too slow and was taking a lenient view of the urban air pollution problem. Public interest litigation in the Supreme Court of India resulted in additional measures for enforcement, particularly in the capital city of Delhi and over the period from 2002 the three other metro cities. Notable among the directives issued by the Supreme Court were the use of unleaded gasoline in 1995 and adoption of Euro II norms for the passenger cars from April 2000 itself in Delhi. Unleaded gasoline was introduced throughout the country during 1999 and Euro II norms are proposed for the rest of the country from the year 2002.

To combat the high concentration of suspended particulate matter mostly emanating from diesel vehicles operating in the city of Delhi, the Supreme Court ordered, on 28 July 1998, that, (i) All pre-1990 taxis and three

wheelers be phased out by 31 March 2000 and replaced by new vehicles running on clean fuels; (ii) All public buses older than eight years be converted to use Compressed Natural Gas (CNG) by 1 April 2000; (iii) The entire city bus fleet operated by Delhi Transport Corporation and private owners to be converted to use CNG by 31 March 2001.

Further in its order of 29 April 1999, the Supreme Court directed all diesel taxis to be converted to use CNG unless they meet Euro II norms for diesel.

'Clean fuel' has not been explicitly defined thus far, though the Supreme Court in its ruling has directed the use of CNG. In fact, when the concerned fleet operators could not adhere to the deadline of April 2001, the Supreme Court on 26 March 2001, asked the Environment Pollution (Prevention & Control) Authority (EPCA) to define 'clean fuel'. The EPCA was asked to recommend other possible fuels that could be used as 'clean fuel'.

Diesel with sulphur content lower than 0.005 per cent by mass is being proposed as a clean fuel. Here, it is important to note that the low sulphur diesel is not going to significantly reduce the particulate emissions, unless the diesel engine technology currently in use in India improved. Fuel sulphur contributes about 0.021 g/kW-hr (grams per kilo watt hour) of particulate emission mass for every 0.1 per cent sulphur in fuel (Singal and Pundir 1996). Thus, even if sulphur from the current diesel fuel containing 0.05 per cent in Delhi is totally eliminated, an average reduction of 0.0105 g/kW-hr in particulate emissions may be expected, which is insignificant compared to average particulate

emissions from the diesel buses operating in Delhi. It may be viewed in the context that the year 2000 Indian norm for diesel particulate emissions for heavy vehicles is 0.36 g/kW-hr, at the maximum. The older diesel buses could be emitting around 1.0 g/kW-hr of particulate matter. Total elimination of sulphur from the current level of 0.05 per cent of sulphur by mass in Delhi would amount to only 1–3 per cent reduction in particulate emissions. In the rest of the country too, elimination of sulphur completely while retaining the current or older diesel engine technology amounts at best only to a 5–15 per cent reduction in the particulate emissions. This means that the key to reduction in particulate emissions is the diesel engine technology. It may be mentioned that diesel sulphur in the USA and Europe was brought down to 0.05 per cent maximum when the particulate emission standards were lowered below 0.13 g/kW-hr for the urban buses in the USA in 1994. The diesel

engine technology at that stage had already advanced to a level that smoke from these vehicles was not visible to the naked eye. This certainly cannot be said about the current Indian heavy-duty diesel vehicles. Use of low sulphur diesel fuel (0.05 per cent sulphur) in such vehicles will serve no purpose. Quick adoption of new diesel engine technology on production vehicles is possible. Then use of 0.05 per cent sulphur diesel fuel would be a worthwhile measure.

CNG IN DELHI

Phasing out of commercial vehicles, older than a certain age, has been implemented. There was some resentment by operators on account of the likely economic hardships. On the other hand, conversion of commercial vehicles, particularly the buses, to CNG operation has been very slow. The Supreme Court in its order of 26 March 2001

Box 5.5.1 NGV Programmes Elsewhere

Natural Gas (including CNG) Vehicle (NGV) programmes are being implemented in over 40 countries, to solve the urban air pollution problem, and also to increase the usage of natural gas, often indigenously available. In other countries vehicle conversion and demonstration trials have been carried out. The extent and success of these programmes has varied considerably. Table B5.5.1 brings out the number of natural gas vehicles on the road c. 2000.

Table B.5.5.1
Natural Gas Vehicles on the Road in Certain Countries (Nos), c. 2000

Asia	No. of NGVs	Other countries	No. of NGVs
India	45,000	Argentina	462,186
China	15,000	Italy	320,000
Japan	6684	USA	90,000
Pakistan	4000	Brazil	60,000
Malaysia	3700	Russia	30,000
Indonesia	3000	Venezuela	27,542
Bangladesh	1000	Canada	20,505
Myanmar	200	Egypt	19,000
Thailand	82	New Zealand	12,000
South Korea	22	Germany	5000

Source: Duncan (2001).

The two largest NGV programmes, in Italy and Argentina, are primarily centered on passenger cars and taxis. Due to withdrawal of subsidies, in New Zealand the number of NGVs has reduced to just about 10 per cent of its size during the 1980s. In the USA, NGV programme is driven by clean air legislation. About 2000 heavy-duty vehicles operate on LNG (liquefied natural gas), while 80 per cent of CNG vehicles are light duty vehicles. About 2000 CNG transit buses are in operation. As mentioned earlier, in the USA natural gas buses were introduced when the diesel particulate emission standards were lowered below 0.13 g/kW-hr in 1994 and 0.091 g/kW-hr during 1995. For meeting these limits, diesel buses required use of particulate traps, which is a much more expensive technology than the natural gas vehicles and its durability was also not proven.

The data for India includes about 20,000 CNG taxis operating in Mumbai. In China, natural gas vehicles form an important component of the vehicular air pollution control strategy. By the end of year 2000, 15,000 CNG vehicles were in operation in some large cities, including Beijing and Shanghai.

In general, heavy-duty NGV programmes for heavy duty vehicles have been slow to take off. This is due to high cost of conversions and technology constraints. In Asia, besides India, Thailand has focussed on conversion of buses to natural gas to reduce urban air pollution.

had allowed six months grace period (upto 30 September 2001) to comply with these requirements. It was to apply only for those operators who had placed, or would place, firm orders for CNG vehicles on or before 31 March 2001 as a replacement of vehicles presently being operated by them. The deadline for placing order for CNG vehicles was subsequently extended by about a month. The Court has further asked the EPCA of NCT (national capital territory), Delhi to examine whether low sulphur diesel fuel could be regarded as a clean fuel.

Delhi has in all about 30,000 buses, including contract carriages operating long distance destinations out of Delhi. Of these, approximately 12,000 are more than 8 years old. Within the city, about 10,000 buses are under operation. Three wheelers number around 87,000. Table 5.5.1 gives the break-up of CNG vehicles as on April 2001 in Delhi (for information on NGV Programmes in Other Countries. See Box 5.5.1).

By 30 September 2001, at least 10,000 buses were to be converted to CNG or go off the road. DTC (Delhi Transport Corporation) had placed order for 1880 CNG buses by March 2001. Private owners may be lagging behind in this respect. The production capacity of CNG buses in the country at the moment is about 1000 units per month. The CNG buses requirement of Delhi can, thus, be met in about a year's time if funding for procurement is available. The number of CNG three wheelers and taxis is, however, adequate.

Table 5.5.1
CNG Vehicles in Delhi (March 2001)

	<i>Number</i>
Buses: DTC	175
Private	100
Cars/taxis/vans	11,100
Three wheelers	13,500

SUPPLY INFRASTRUCTURE

In Delhi, 68 CNG filling stations have been set up. The CNG dispensing stations, depending upon the type of infrastructure employed and forms in which natural gas is available at the site and storage facilities, are categorized as mother, on-line, or daughter types. Mother filling stations compress the natural gas available from the pipeline network at the site to high pressures of 250–300 atmospheres, which is stored in high pressure storage tanks for dispensing to the vehicles. On-line stations directly deliver the natural gas to the on-board vehicle storage cylinders as the gas is being compressed. Both these types of dispensing stations complete filling of gas into on-board vehicle cylinders to about 200–50 atmospheres

pressure in a short period of less than 10 minutes even for heavy vehicles. The daughter CNG filling stations on the other hand employ a cascade of high-pressure cylinders filled with CNG at mother stations. Such a system can refuel only small vehicles like three wheelers or taxis, and has a high amount of residual gas at low pressures, which cannot be delivered to the vehicles at the desired pressure. The break-up of different types of CNG filling stations at present in Delhi, including total dispensing capacity, is given in Table 5.5.2.

Table 5.5.2
CNG Filling Stations in Delhi (March 2001)

Station type	
Mother	8
On-line	13
Daughter	44
Daughter-booster	3
Total compression capacity (kg/day)	196,072
Average daily sale (kg/day)	95,000

Although the total dispensing capacity is 196,072 kg per day, yet there are frequent complaints by taxi and three wheelers of long wait extending from 1 to 2 hours⁴³ and not getting CNG at the required pressure as these are mostly served by the daughter stations. To fuel 10,000 buses, with an average operation of 400 km/day/vehicle requires total dispensing capacity of about 1,300,000 kg per day. Thus, by September 2001 the CNG dispensing capacity was to be increased by a factor of 6.5 to service the bus fleet alone for implementation of the Supreme Court orders. Only the mother or on-line CNG filling stations can fuel the buses. About 100 to 125 additional CNG filling stations would be required to meet this demand. The cost of a CNG station varies from approximately \$2,00,000 to \$1 million (Jones 2001). A CNG dispensing mother station costs around Rs 4 crores excluding the cost of land in Delhi.

The experience and the public reaction on implementation of the Delhi CNG vehicle programme so far is summarized below:

- Adequate infrastructure was not available for conversion to CNG, particularly the buses
- TELCO and Ashok Leyland, the two heavy vehicle manufacturers in India, could not meet the demand of new CNG buses
- TELCO and Ashok Leyland were not involved in conversion of old vehicles to CNG operation, and the quality of conversion has not been satisfactory
- Bus operators complained of engine overheating

⁴³ Status prior to the events in August 2001, when waiting periods began to exceed days.

- CNG refueling infrastructure is not adequate as consumer complaints of low pressure are many
- Long refueling time and hence long queues with waiting period of 1–2 hours
- Certification and inspection of converted buses were inadequate. There were reports of use of spurious cylinders resulting in bursting of cylinders and accidents
- Three-wheeler operators complaints of high maintenance costs.

The overall impressions of the programme have not been encouraging primarily due to poor implementation, planning, and strategy. Several challenges are faced in an alternative fuel programme like the one being implemented in Delhi.

CHALLENGES

The introduction of an alternative fuel is a complex issue where several facets of the problem are to be addressed. Technical and economic objectives may not be met due to faulty selection of target vehicles and equipment. If the programme aims also at converting the existing vehicles, the programme should target only the vehicles in good mechanical condition and where maximum environment and/or replacement benefits are possible. In Delhi, a company obtained type approval certification for conversion of a 1992 model bus. However, it has been rendered inapplicable, as the buses older than 8 years were withdrawn in the year 2000. The operators, who have deposited advance money to get their fleet converted by this company, have been subjected to avoidable hardships.

Many a times, dual-fuel technology is touted as an appropriate technology with the justification that it provides a flexible fuel option. In the dual-fuel vehicles, conventional fuel is partially replaced by the alternative fuel and the vehicle uses both the fuels simultaneously. It is argued that if alternative fuel is not available, the vehicle can be operated on the conventional fuel, hence giving flexibility of operation to the user. However, pollution mitigation being currently

the principal objective of such programmes, the dual-fuel option does not provide the necessary environmental benefits. Table 5.5.3 gives a comparison of the typical emission potential of CNG–diesel dual fuel and dedicated spark ignited CNG heavy-duty vehicles (Weaver 1989). It is quite clear that vehicles with closed loop catalyst, as type 4 in Table 5.5.3, give significant reductions in nitrogen oxide and particulate emissions compared to the diesel version and should be considered for Delhi. In addition, carbon monoxide and hydrocarbons, emissions although higher than the diesel version, are still quite low.

Technology and infrastructure to manufacture new vehicles to meet the programme targets should be available well in advance, for which adequate lead time is to be provided to the original equipment manufacturers (OEM). Secondly, the manufacturers should be given firm assurance about the number of vehicles required for them to plan the production through a well-planned CNG vehicle phase-in schedule. The concerned vehicle safety and emission regulations and standards are to be formulated in advance. This enables the vehicle manufacturers and companies undertaking conversion jobs to have full information on what standards to follow and meet. In India, such regulations for heavy vehicles were formulated and notified only in February 2000 just about a year before the implementation date. Thus, the time available to the vehicle manufacturers for fine-tuning of the design and to undertake production to meet the mandated targets of CNG vehicle introduction was inadequate.

Poorly managed demonstration programmes lead to negative perceptions. Many a times the public and operators perceive the alternative fuels as only an inferior substitute, due to lack of proper public awareness campaign. This perception is further strengthened by poor quality conversion jobs done on demonstration vehicles. Poor performance of the converted demonstration vehicles may cause incalculable harm to any well meant programme that is not planned well.

Table 5.5.3
Emission Potential of Engines

Engine type	Cycle	Emissions g/kW-hr			
		HC	CO	NO _x	PM
1. Diesel	13- Mode	0.46	2.17	13.59	0.54
2. Diesel and NG Dual Fuel	13-Mode	21.74	17.12	8.15	0.34
3. TNO closed loop without catalyst	USHD Transient	4.85	31.64	9.33	<0.013
4. TNO closed loop with catalyst	USHD Transient	1.36	9.02	1.58	0.013

Note: NG: Natural Gas; USHD Transient: US Heavy Duty Transient Test Cycle; HC: Hydrocarbons; CO: Carbon Monoxide; NO_x: Nitrogen Oxides; PM: Particulate Matter; TNO : TNO (Netherlands Organization of Applied Scientific Research).

Source: Road Vehicles Research Institute.

Co-ordination is the Key

Typically, a number of participants and interest groups are involved in the success of such programmes. Fleet operators, fuel suppliers, vehicle manufacturers, regulatory bodies, market administrators and financial services are the main stakeholders, among others. Co-ordination and leadership of all these stakeholders is a major challenge. Suitable environment for market development and balance between demand and supply of services is to be maintained. The programme should receive a clear endorsement of the government to provide necessary confidence for the investors to participate. A central agency to co-ordinate the total development of the programme, creation of technical standards, mentoring and monitoring of various participants, overcoming technical, market, and legislative constraints etc. would significantly benefit implementation of the programme.

Fuel Supply

Failure to provide an adequate fuel supply infrastructure has resulted in long queues at the few filling stations in Delhi. Nothing could have been more adverse publicity for the programme. There are choices here in terms of higher capital cost of fast filling stations versus low cost but slow rate filling stations, and scheduling—wherein heavy vehicles could use night hours for filling. Ultimately, of course, the option is really to have the lowest operation costs, including the cost of waiting at filling stations, that includes the opportunity cost of a bus or a taxi that has to wait. There is still no recognition of these problems in the implementation process.

The production of specifically built CNG vehicles by the OEMs is the best route to vehicle performance, emissions, and cost, relative to conventional vehicles. The potential of cost benefits are most favourable for the heavy vehicles, as the dedicated CNG heavy vehicles can be built at costs comparable to those of diesel vehicles. This would avoid the high cost of conversion and improve the economics of operation. The cost of conversion of existing vehicles today is slated approximately at Rs 4.0 lakhs for a bus. The operator does not see a short payback period for this investment, and hence there is very little voluntary enthusiasm towards the programme. The major constraint for the OEMs, however, is the economic scale of production. If the total demand is around 20–30 thousand vehicles only, with no significant sustained annual demand, it is not economically attractive to the vehicle manufacturers to make large investments for the production of state of art technology vehicles. The creation of infrastructure and trained manpower for servicing is also linked with the total demand of such vehicles and the business opportunities it provides.

A long-term energy and transport policy for the country can provide confidence to the associated industries to make the necessary investments in creating fuel supply

infrastructure, production of purpose built vehicles with best performance, and service infrastructure. An easier way to motivate bus operators to CNG conversion would have been to provide a fuel price advantage for CNG, say for the next five years. That also would have given clear policy directions to the vehicle manufacturers and energy companies to commit resources to CNG, without too high a policy risk.

CONCLUSIONS

The conversion of light vehicles to CNG operation has been quite satisfactory. The relatively easy availability of technology and low cost of vehicle have been the primary factors responsible for the high conversion of the light vehicles. However, the rate of conversion of buses to CNG has been nearly insignificant.

A study of various alternatives should have preceded the decision taken for CNG conversion. It is unfortunate that the definition of 'clean fuels' is being sought now when the CNG bus programme has failed to meet the mandate. This definition should have been available through discussions with technical experts before requesting the Supreme Court, through a public interest litigation, to issue its order in July 1998 on the use of clean fuels in all commercial vehicles by 1 April 2001. Possibly, other options, like advanced diesel engine vehicles meeting Euro III norms etc., could have been allowed in parallel. Once the old buses are being scrapped, the introduction of advanced diesel vehicles with matching fuel could have given the desired effect, of course over a little longer period, at much lower vehicle and infrastructure costs. Sustainability of such a programme would also have been easy. Many cities in the West, having a much larger population of vehicles, are far cleaner than Delhi, without enforcing conversion of all buses to CNG operation.

Once the decision on CNG conversion was taken, an institutional leadership could have avoided a system failure. A central nodal agency should have been made responsible to co-ordinate and implement the programme. Presently, the formulation of emission standards is the responsibility of the Ministry of Environment and Forests. The Ministry of Surface Transport notifies the standards, and enforcement of the Motor Vehicle Rules is a state subject. Delays in notification and issuing of standards and in general lack of coordination among these agencies, result in keeping manufacturers in confusion on the standards to follow and comply with.

Working through fuels and specific technologies is at best a poor second to notifying realistic emission regulations with seriousness of enforcement and adequate notice for industry, enforcing agencies, and others to get prepared. This is the route that most countries having successful vehicle emission reduction programmes have adopted. The choice of technology, engine types, and fuels has been left for the market forces to decide.

5.6 ENVIRONMENTAL IMPACT OF LARGE DAMS: A SOCIAL CRITIQUE

*Bernard D'Mello*⁴⁴

Large dams have contributed in a significant way to extending irrigation and thereby facilitated the spread of the 'green revolution' in Indian agriculture.⁴⁵ In the light of the outcome of the Supreme Court judgement on public interest litigation (PIL) related to the Sardar Sarovar Project (SSP), a part of the Narmada Valley project, we analyse the judgement and its critique by People's Union for Democratic Rights (PUDR), to focus on the issues it raises with respect to the attitude of the power elite (Mills 1963) and the state towards those who remain unrepresented in the power structure of the society. Even though Environment Impact Analysis (EIA) and Social Impact Analysis (SIA) is prescribed and for large dams, it has been ritualized as a mere appendage to sanctify the process driven by the interest of the elite. The focus of our analysis is on social and environmental aspects of large dams, which is equally relevant for large infrastructure projects entailing endowment redistribution or social impact, in general. Based on our analysis, we are led to conclude on a realistic, but what may seem to some a rather pessimistic, note that the power elite of the country has to go a long way in incorporating the liberal values of pluralism, legalism, scientism, and political equality in its decision-making processes. It is only if and when these values permeate the power elite's decision-making that EIA and SIA can get truly institutionalized. Otherwise, they may simply remain rituals as pretence of a liberal democratic society. The lack of concern towards some of the positive values of liberalism is but a symptom of a deep malady of the Indian political-economic system.

THE NARMADA CAMPAIGN AND PIL⁴⁶

In this section, we draw on commentaries on campaigns around the adverse environmental and social impact of the Sardar Sarovar Project. At the outset, we must make it clear that we do not accept the characterization of the conflicts that we are analysing here as 'environment versus development' conflicts. This is because to us the notion of

development, without any prefix, denotes, in a Polanyian perspective (Polanyi 1944), 'habitat'—the habitability of the natural environment as well as the security of individuals in their socio-cultural environment—and 'improvement'—productivity and economic growth.

Development and concurrent 'underdevelopment' of the huge order of magnitude caused by the Narmada dams project spurred a social movement of the victims of the project. The Narmada Bachao Andolan (NBA) was formed in 1989, with the coming together of smaller groups in each of the three states, Maharashtra, Gujarat and Madhya Pradesh—groups that organized the victims at the local level. The NBA leader, Medha Patkar, who essentially derives her legitimacy on a moral and charismatic basis, not only won the confidence of the people who were to be adversely affected but also influenced the financial decision-makers and environment lobbyists in Washington and Tokyo against the project. Initially, the Narmada Valley project was to be financed partly by the World Bank, which seemed to have endorsed the project plan, with all its failures. But later under public pressure, the Bank withdrew in March 1993, after an independent commission appointed by it, the Morse Commission was highly critical of the resettlement and rehabilitation policy and practice.⁴⁷

The NBA now began demanding that the Indian government appoint a commission to undertake a comprehensive review of the project. The *jal samarpan* or self-sacrifice by drowning, during the monsoon months, has been the most powerful 'Gandhian' tactic employed. That was how the NBA forced the central government to announce a review in August 1993, but predictably, the Gujarat government refused to participate. In May 1994, the NBA filed a PIL against the project in the Supreme Court under Article 32 of the Indian Constitution.⁴⁸ This PIL was filed in the public interest by the NBA to protect the right to livelihood of the adversely affected persons due to the SSP. According to the petitioner, at least 150,000 persons in 245 villages in the submergence zone are/will be badly affected. They are mostly tribal people and other marginalized peoples, being forcibly displaced and uprooted. They are not being given a chance to be heard and are not receiving proper compensation and resettlement. The project authority is going ahead with the project without having completed the studies required to arrive at an EIA and an SIA. It is

⁴⁴ The author is grateful to Ram Guha and Sebastian Morris for critical comments on an earlier version of this essay. The usual disclaimers apply.

⁴⁵ This is a *social* critique of the environmental and social impact of 'large' dams and assessments made of such impact. We are not dealing with the question of *technical* choice between 'large' and 'small' dams. Much of that controversy reveals widespread technical incompetence on both sides of the debate.

⁴⁶ See Divan and Rosencranz (2001).

⁴⁷ As per a reviewer with 'inside information' there was a subsequent internal report of the Bank questioning the Morse report.

⁴⁸ Writ Petition (Civil) No. 319 of 1994.

violating a number of the conditions laid down by Narmada Water Disputes Tribunal (NWDT) on the basis of which a conditional clearance was given by the MoEF.

The Supreme Court (SC) judges, Chief Justice A.S. Anand, Justice B.N. Kirpal, and Justice S.P. Bharucha, in the traditions of PIL set by their predecessors, Justice Krishna Iyer and Justice P.N. Bhagwati, had an opportunity to:

- Contribute to ensure that the planning, implementation, and administration of similar large projects in the future be obliged by a commitment of the state to the social welfare of the poor and marginalized, and to the preservation of the natural environment
- Ensure the required social and environmental corrective actions in the SSP case, with the participation of the NBA as a representative of the poor and marginalized victims of the project.

But on 18 October 2000, the NBA petition was dismissed and the court allowed the dam to be built to its full height of 138 metres. (The height of the dam then stood at 88 metres.) There was, however, a split in the three-member bench, with the majority judgement of Chief Justice Anand and Justice Kirpal constituting the verdict in the case. Justice Bharucha differed, but his was the minority judgement. Given the facts and analysis put forward before the court, his judgement was more in tune with the generally accepted tradition of dealing with PIL, established by such judicial authorities as Justices Krishna Iyer and P.N. Bhagwati.

Learnings from the PUDR Critique?

A reading of the PUDR critique (PUDR 2000) of the Supreme Court judgement seems to suggest the following:

- There is no appreciation of the idea of relevant 'stakeholders' representation in the sub-groups that the Narmada Control Authority (NCA) was obliged to set up under various directives—the Resettlement and Rehabilitation (R&R) sub-group (formed in response to a Supreme Court directive to a petition filed by B.D. Sharma in 1990), the Environment sub-group (formed as an essential condition for Environmental clearance by the MoEF). This seems to have exacerbated the impasse between the state and project authorities, on the one hand, and the NBA, a representative organization of the 'victims' of the project, on the other.
- The R&R and Environment sub-groups are unrepresentative when viewed in a stakeholder framework. The sub-group on Relief and Rehabilitation (R&R sub-group) have the Secretary, Union Ministry of Welfare, as its chairperson. The members are government officials and some technical persons. Similarly, the Secretary, Union Ministry of Environment and Forests, chair the sub-group

on Environment. Its members are government officials and some technical persons.

- When it was proved that these 'unrepresentative' sub-groups were not doing their job (monitoring rehabilitation in the field; ensuring the implementation of environmental safeguards) sincerely and efficaciously, the SC ordered the setting up of state-level Grievance Redressal Authorities (GRAs) to monitor rehabilitation. A retired judge of the high courts chaired these, and, according to the minority judgement, only these GRAs could be trusted. Yet, now the GRAs have no veto power; they are merely available for consultation by the 'unrepresentative' R&R sub-group.
- Even after more than two decades (the NWDT 'settled' the inter-states dispute in 1978), reasonable data to assess the likely impact on flora and fauna is not yet available. Much remains to be done by way of studies and by way of action about the likelihood of excessive soil erosion from the catchment leading to excessive siltation of the reservoirs. Indeed, an apparent absence or inadequacy of data on some important environmental aspects still persists. The MoEF had abdicated its responsibility and left it to the Prime Minister's Office (PMO), to 'clear' the project on politically expedient grounds. A conditional clearance was given on 24 June 1987 subject to (i) the planning and implementation of environmental safeguards be carried out *pari passu* (at an equal pace) with the progress of work on the project, (ii) the environmental science and engineering studies would be carried out as per the schedule, and (iii) the catchment area treatment and the rehabilitation be planned so that these will be implemented ahead of the reservoir filling. None of these have been adhered to, as per the minority judgement.
- The MoEF issued guidelines for EIA of river valley projects in 1985. But the project was given a conditional environmental clearance by the MoEF without the necessary data with respect to the likely environmental impact being examined and contrary to the guidelines of the MoEF itself, as stated in the minority judgement.
- 'Costs' such as the loss of forests, the costs of catchment area development, diversion of railway lines, and the 'costs' to the persons displaced by the SSP were marked as unknown in a note that the MoEF sent to the PMO in December 1986. The MoEF admitted the impossibility of knowing the 'costs' of loss of habitat of other forms of life and the overall loss of biological diversity. More important than the doctored figures that usually get plugged into a social cost benefit analysis (SCBA) is the fact that this method fails to provide an assessment of the distribution of the various likely costs and benefits to different economic classes of persons affected, either positively or negatively.
- The Narmada Bachao Andolan (NBA) is pilloried for wasting public money in presumably contributing to time

and cost overruns through its PIL. There is no recognition of the fact that the NBA does represent the interests of the poor among the displaced persons in struggling for their constitutional rights. It seems to me that even some representatives of the highest judicial body in the country thus do not have any respect for the principle of pluralism. This is a democratic recognition that there may be many different kinds of interest groups, individuals, and civil society organizations and government agencies who are concerned and would like to share responsibility, commensurate with the entitlement of a 'voice', in issues related to the environment and the livelihoods of persons affected.

- The (majority) SC judgement dissociated itself from arbitrating on controversial public policy issues in this case, even though it is generally accepted that the legal system is the ultimate arbiter of conflict. Legislation on environmental matters related to the project in the form of the Environmental Protection Act was passed in 1994 and environmental litigation under that Act could have been allowed in view of the gross omissions by the NCA and the MoEF under the earlier guidelines of 1985.

- Over the last decade, the market is being relied upon more and more to direct and inform environmental goals, say by trying to persuade consumers to value the products of so-called environmentally responsible companies more, *ceteris paribus*. The Narmada Control Authority (NCA) could have ceased the opportunity to at least appear to be environmentally responsible by reaching a compromise with the NBA on freezing the height of the dam at the prevailing (88 m) level and building separate canals to transport water to parched Kutch and Saurashtra, with very restricted withdrawals along the way.

- The SC judges could have asked for the environmental issues surrounding the project to be dealt with more on the basis of knowledge of environmental science and engineering and of the social sciences. Instead, the majority judgement took a public administration perspective. An attitude that environmental issues can be resolved by the application of science and developments in science and engineering may have been more acceptable to both parties to the dispute, especially since there seemed to be no other way of arriving at (even an unstable) consensus.

- Given the proclivity of Justices Anand and Kirpal to give a virtual clean chit to the project authority that R&R was more or less proceeding according to the NWDT award on the basis of *unverified* affidavits of the respondents, rationality, logic, and scientific temper took a back seat. Of course, the NBA's affidavits too were not verified. But given the bias of the Justices to believe one set of unverified affidavits (the respondent's affidavits) and reject another set of equally unverified affidavits, how could one even expect

them to have adopted a way out of the imbroglio as suggested in 10 above.

The public administration perspective used by the Supreme Court in deciding on the case raises important issues. In a liberal democratic society, or one which pretends to be as such, the courts are rightly expected to provide some semblance of protection of law to those who may be outside the dominant coalition of the society. Their independence and institutional strengthening is seen as a key feature of such societies. This is particularly important as the power and institutional structures in societies are prone to collusion, nexus formations, and other dysfunctionalities, which require balancing. The worst sufferers of such dysfunctionalities and state failure are the underprivileged, when their interests clash with that of dominant coalition. To take a public administration perspective in a case like that of NBA is either to admit that state failure is impossible or that the perspective of dominant coalition is shared by the court. While the former position is 'naive', the latter is reflective of a lack of liberal outlook and acceptance of plurality.

EIAS AND SIAS

The environmental and social impact analyses carried out in the context of large dams and infrastructure projects has been ritualized in a context where the politicians, bureaucrats, large land owners, and private interests are likely to make any such analyses subservient to their own objectives (see Box 5.6.1, based on part of a study by the World Commission on Dams). In this section, we focus on environmental impact analysis (EIA) and social impact analysis (SIA) and explore the political, legal, economic, and scientific and technological institutions (S&T) and frameworks required for them to achieve the aims of those analyses. We also assess whether such an 'idealized' analysis is feasible and the issues and impediments embedded in the political economy of the existing state.

What Should a 'Progressive' EIA and SIA Be?

EIA in the context of large projects like dams is an activity that is designed to *identify* and *predict* the impact of a large dam project on the biological, geological, and physical environment and on the health and well being of human beings. The identification and prediction of these likely impacts has to take account of the specific legal framework, the practice of public policy, social welfare programs and operational procedures on the ground. In a decent society, an EIA also has to interpret and communicate the impacts to all concerned, including the likely victims of the project, in the form of information that can be understood by all.

It is this information which is supposed to be the basis of logical and rational decisions, including amelioration of the victims of the development process, the poor and exploited, as well as other forms of life. What are the conditions under which an EIA can achieve all of this?

An EIA should lead to an environmental impact statement (EIS). The process of preparing an EIS necessarily involves *public hearings*, where the effort should be to involve all those who are likely to be affected by the project. The draft EIS should be widely circulated so that the public and 'public intellectuals' have the opportunity to critically review and comment upon it. The final version of the EIS should be published and made available to the public, and should include the comments, critical or otherwise, of all the reviewers. It is at this stage that the EIS should be submitted to the Ministry of Environment and Forests (MoEF) for a decision, after which, only if the project is environmentally approved, may work be initiated on the project. But a provision is still open for PIL brought to the courts. Indeed, carefully designed administrative, procedural, and jurisdictional structures, preferably with a decentralization of responsibility, and through an elaborate screening and public hearings process, can minimize the probability of PIL on environmental and social issues reaching the courts.

An EIA necessarily includes an SIA. Social, economic, and demographic impacts, such as displacement of peasants and tribal communities from the land and the forests, their relocation elsewhere, the impact of the project on agriculture in the region, migration, employment opportunities, health, livelihoods, and inequality, may be manifested directly or via the environmental impacts. Further, what happens to land market values? There are aspects of development and underdevelopment that simultaneously occur. The shifts in local population and the labour force, the multiplier effects, forward and in reverse, both of incomes and employment, displacement and relocation problems, the demands on housing, schools, water, sewerage, health and social welfare, recreation, law and order, and social justice have to be assessed. Changes in the intangible aspects of living such as a sense of loss of place, the feeling of disintegration of community, social disintegration, etc. may be equally, if not more, important.

We must particularly analyse the changes in the class differentiation of the peasantry that may occur over time with the unequal distribution of the benefits of assured irrigation in the command area. A progressive SIA may have to take account of the likely compositional changes in the above class differentiation of the peasantry as a result of (differential) access to assured irrigation water. It will also have to assess the likely impacts in the labour, land, and credit markets as a result of the adoption of green revolution techniques. In the Indian context, a 'progressive' EIA and

SIA will also have to be explicitly sensitive to the reality of the institutionalized inequality of caste and gender. Under Indian conditions on the ground, all this is of course easier said than done. In an Indian setting, the institutionalized oppressions of caste and patriarchy limit social and professional mobility in particular ways. One's social position gets predetermined to a significant degree by the caste and gender one belongs to. In the case of caste, one's social status itself becomes essentially hereditary. However, it is the rich peasants and big landowners that are generally able to influence the actual distribution of water or compensation on the basis of land for land, and so on. But there would also be location specific unequal distribution of irrigation water depending on whether one's fields are in the upper, the middle or the tail reaches of the canals.

What may possibly happen to the various classes of people, the displaced who were living and earning a livelihood in the catchment and reservoir areas? That again will likely depend on one's existing class position. The rich peasants, the big landowners, and the traders are likely to enjoy the political patronage of one or the other of the main parliamentary parties. They may arrange deals of land for land, and so on, and in general, may be positively compensated. But the poor peasants and landless wage labourers may be the victims of the process of displacement. An economist may retort that 'landless labourers perhaps may be the greatest gainers! If they were landless they could not have lost anything. Agricultural production, *ceteris paribus*, due to the assured irrigation input, goes up by leaps and bounds, creating many job opportunities for such people, also leading for some time to growth in the real wage rate. Further, some more landless labourers would be better off with migration to the irrigated areas'. The point we are making may thus be missed. While capitalist development coerces the poor peasants and landless labourers to respond in ways that the economists may be able to anticipate, the point here is that capital and the state decide the fate of the poor without their consent.

EIA and SIA Go Together

At a general level, production is a process of transformation of a determinate given 'raw material' (in the case of a dam for irrigation, part of the river flow) into a determinate 'product' (an *assured* supply of irrigation water). This transformation is effected by a determinate human 'labour' (intervention), using determinate means (capital goods, technology, techniques, and organization). Fundamentally, tangible production is a human-nature interaction, where the former are conscious beings. Because of human consciousness, the knowledge of the production process exists in collective human imagination at the very commencement of the process. Human beings directly

interact with the 'raw material', using capital goods, technology, techniques, and organization to transform it into the determinate product. But in doing so, in this human–nature interaction, they effect a transformation of nature and in the process social relations evolve too (Marx 1867, Childe 1942). It is for this reason that an EIA and an SIA need to go together. They are methodologically inseparable, if the desired result is to be achieved. The above would also perhaps dovetail well into the ecosystems approach.

Further Methodological and Ethical Issues

The above discussion has been pointing at methodological issues and problems. Some of these are quite intractable, like for instance, particular social and environmental impacts may be assessed differently by different social groups. The assignment of implicit weights to the various social and natural environmental impacts may also reflect the class biases of the power elite who take the major decisions regarding large projects. The social benefit cost analysis (SBCA) derives its theoretical framework from the philosophy of utilitarianism. While 'larger public good' may be invoked to support decision making, it entails dilemma associated with redistribution of endowments (with all attendant information problems) and non-negotiable (non-economic) aspects of life. Utilitarianism, applied to the process of development and underdevelopment, implies that traditional moral rules can be broken if by doing so they produce a balance of happiness over misery! Further, the methodology is prone to biases of powerful stakeholders creeping in, if those who apply it are in the services of capital or the State.

Political, Legal, Economic and S&T Institutions and Structures Matter

Environment Impact Analysis (EIA) and Social Impact Analysis (SIA) have to take account of the specific legal framework, the practice of public policy, social welfare programmes, and operational procedures on the ground. The existing political, legal, economic and scientific and technological institutions and structures will also shape the quality of an EIA–SIA. We have to acknowledge the fact that the power elite in control of the process of production and mainstream politics in India have denied fundamental justice, and not just economic entitlements, to poor people. In general, one cannot expect the courts to be very different in dealing with issues that affect the poor in a society that accepts and expects disparities in political power and the distribution of economic resources. The administrative agencies seem to have certain in-built characteristics that in turn have detrimental consequences for the poor who lack the resources and education to pursue their claims effectively. We social scientists often seem to get locked into analysing

the administrative, procedural, and jurisdictional structures within and among government agencies. There is a whole technocracy and bureaucracy composed of scientists, engineers, technicians, lawyers, bureaucrats, and politicians interacting with their counterparts in the private contractors and financial institutions, foreign and Indian. The contractors and financiers have their marketing, sales and public relations executives, lobbyists, and fixers who have a specialized knowledge about dealing with government bureaucrats and technocrats, and the politicians, whether in New Delhi or the state capitals. What we think is of essence is not so much the framework within which decisions are taken but the goals imposed by that framework. For the contractors, the big landowners and rich peasants, it is to make as much profit as possible and accumulate capital as rapidly as possible. This suffuses the ideology and values of all the powerful and wealthy 'stakeholders'.

There is an immense complexity in the decision making process of the Indian government at the centre and in the states, with such a large number of personalities participating in the making of decisions on large state-sponsored development projects. The power elite simply functions within a framework, which allows, and indeed encourages, the plunder of the surplus generated. In such a framework, this goal of the power elite—the big landowners, the rich peasants, big industrialists, financiers and traders, the top bureaucrats and politicians—gets operationalized in terms of business interests in agriculture, industry, finance, and trade. The top bureaucrats and politicians representing the government cannot afford to *implement* policies and programmes that will jeopardize business confidence. In the 1990s, the very success of public policies has come to be judged by the probability that they will enhance business prosperity and promote private investment. The mutuality of interest between the political executive and business has deepened. To us, it is not very surprising to find the Union Minister of Home, L.K. Advani, while inaugurating the restart of the construction of the Sardar Sarovar dam after the NBA's PIL was dismissed in the SC, sharing the dais with Jaiprakash Gaur of JP Associates, the largest big dam contractor in India. In such a context, it is difficult to envisage that any kind of SIA or EIA, or the processes followed, will be adequate to take care of the 'unwarranted' outcomes of development on the poorer sections of the society.

CONCLUSION

In the Indian, and indeed, labour surplus, low productivity–income, low land–person ratio, capitalist economies, the risk of impoverishment from involuntary displacement due to infrastructure projects like large dams is very high. If

these infrastructure projects claim to contribute to 'sustainable development', then, apart from the beneficiaries, the government and the project authority ought to have an ethical and legal commitment towards the rehabilitation and development of the victims of these projects. Conceptually and for practical purposes, natural environmental and social environmental impacts belong together in an assessment of any impacts of significant change brought about by dam projects. Hence, EIA and SIA go together. One can anticipate a complex web of cause and effect dynamics and multiple order impacts on a community and the natural environment that is triggered by the decision to set up a large dam.

The real problem in the context of such large projects seems to be more of institutionalizing EIA and SIA. The practice of the power elite and the state—at the level of the planning, implementation, and administration of large projects, or even in the judicial system when these practices are challenged by public-spirited organizations with PIL—

suggests that the processes are by and large antithetical to the liberal values of pluralism, legalism, scientism, and political equality. The latter is a mere symptom of a basic malady that came to the fore once again in the 1960s—incipient and open conflict between the rural poor and the agrarian rich, between the industrial workers and the industrial capitalists, and between the agrarian rich and the industrial capitalists. While green revolution strategy promoted by the Indian state may have helped avert disruptions, it created new problems, some of them related to dams that we have discussed here.

Are there any solutions that follow? Solutions to problems that have systemic roots can possibly emerge over a long haul in the course of a popular struggle for socialism, a socialism that begins with democracy. The present path of capitalist development—a grab-what-you-can-for-yourself path of growth that is inimical to human beings and to all other forms of life as well—is not the way to proceed if we want a just and humane social order.

Box 5.6.1

Large Dams: India's Experience¹

India has over 4000 large dams as defined by the International Commission on Large Dams (ICOLD). Most of these were built between 1970 and 1989. Around three-fourth of these are in the states of Maharashtra, Gujarat, and Madhya Pradesh. The main purpose is generally irrigation, where the dam is a multi-purpose one.

Before we come to the social and environmental aspects in the World Commission on Dams (WCD) India case study, a brief comment on the framework of laws, policies, institutions, and procedures² and financial, economic, and distribution aspects of dams.³ The Land Acquisition Act, dating back to the nineteenth century, allows the state to take over private land for 'public purpose'. It is very difficult in law to challenge the 'public purpose' claimed by the state. Then there is the Official Secrets Act, another legacy of the colonial period, which allows government actions to be veiled in secrecy and denies access to relevant information to the public. Ramaswamy R Iyer and the other authors to the WCD India case study point out that this 'renders all talk of 'participatory' or 'people-centred' planning meaningless'.⁴ But critical appraisal of the Land Acquisition Act and the Official Secrets Act by Ramaswamy R. Iyer is located in the liberal conceptual opposition of 'state' and 'civil society'. Alternatively, however, if one were to start with the diametrically opposite conception that the 'state' expresses the particular characteristics of 'civil society' and its class structure and relations, then one can possibly get beyond a liberal right critique of singling out state oppressions alone.

Pranab Banerjee, who authors the economic appraisal section, seems unfairly selective in his critique. Having chosen to go by social benefit cost analysis (SBCA), he should have mentioned that the positive externalities of irrigation have then rightly to be accounted for and the economic value of irrigation water (not at artificially low water rates) has to be brought in. Similarly, leakage due to corruption, which has little to do with dams *per se*, say a standard 5–10 per cent cut on capital expenditure inflate the capital costs. Having adopted the same framework of analysis as the power elite does, the WCD India analysts, statements seem to be patently one-sided.⁵ If one chooses to go by mainstream analysis, then the problem is perhaps not that the choice of large dams in a technical sense may have been wrong. A more relevant statement of the problem may then be the utter (revealed) mismanagement by the Indian state of large dams, project displacement, redistribution, etc. Government processes of decision-making have made long gestation projects particularly vulnerable to failure.⁶ Also, the usual neo-classical 'choice of technique' framework views the choice of technique as a technical choice alone. In reality, the choice may also and more importantly, be a social one, exercised by large landowners and rich peasants, contractors and industrialists, and state functionaries to extend their control over economic processes, secure their appropriation and distribution of surpluses, and the control of state property.

¹ This is a review of the Indian case study on large dams by Rangachari et al. (2000).

² Ramaswamy R. Iyer, Chapter 3, Rangachari et al. (2000).

³ Pranab Banerjee, Chapter 4, Rangachari et al. (2000).

⁴ *Ibid.*, p. 207.

⁵ See also B.D. Dhawan's more thoroughgoing economic analysis over three decades, in his book *Studies in Indian Irrigation* (1999), Commonwealth Publishers, New Delhi.

⁶ Morris, Sebastian (1987), 'Process of Investment Decisions in the Public Sector: A Study of Delays and Cost Overruns', mimeo., Institute of Public Enterprise, Hyderabad.

ENVIRONMENTAL IMPACTS⁷

The relevant questions dealt with are essentially two. Which of the social and environmental impacts were anticipated? For the adverse impacts that were anticipated, what were the steps taken to minimize them and with what effect?

The findings are that large portions of the adverse environmental and social impacts were simply ignored. Till 1978, which means we are considering some 2500 large dams that were initiated prior to that year, there was no formal requirement to assess the environmental and social impact. However, two environmental impacts, one that affects the life of the dam, and the other, which negatively impacts on the yields in agriculture, namely a high rate of siltation of the reservoir and severe waterlogging, were of concern. In our view, this may be because the incremental cost of remedial measures was much lower compared to the incremental benefits accruing from such measures. More importantly, such impacts that directly affect the pecuniary interests of agrarian and, indeed, more generally agribusiness cannot possibly be totally disregarded by any ruling class coalition.

In 1978, all new dams were required to be assessed for environmental impacts and had to be cleared from an environmental impact consideration angle prior to the start of construction. Despite this, the WCD India case study reports that the 1800 or so dams taken up for construction since then continued to adversely affect the environment. The Department of Science and Technology (DST) specified guidelines for the conduct of EIA. Environment Impact Analysis became a statutory requirement only in 1994 with the modification of the rules of the Environment Protection Act. But by and large the same sketchy guidelines for EIA continue even today, disregarding scientific progress since then (p. 42). Further, a lack of retrospective assessments seems to suggest that there may be less scientific basis in the assumptions made in forecasting environmental impacts in today's EIAs than if the actual environmental impacts of earlier dams were studied. These retrospective environmental studies would also have helped in designing better mitigation measures for the present dam projects, as also in correcting the failures of the past at the earlier constructed dams.

Overall, Shekhar Singh and his team who author the EIA section of the WCD India case study fail to provide a penetrating analysis as to why the kind of situation they describe prevails. Also, one is left wondering that if EIAs were indeed carried through and submitted on time, would the decisions and the outcomes have been any different from what actually happened, especially in the absence of protest movements.

SOCIAL IMPACTS

The WCD India case study finds that many of the adverse social impacts of large dams are either not incorporated or very inadequately reflected as costs in the calculation of the benefit-cost ratio or BCR. Rehabilitation of the displaced people is taken into account since 1978. But here too it is only the financial burden of relocating and resettling the displaced people, more often just the compensation given, that is taken account of in the financial analysis. With respect to rehabilitation the authors state 'Rehabilitation of project-affected persons is generally treated as a marginal issue that does not deserve focussed attention...'

In this context, one must mention that while there is now at least an official recognition of the right to compensation for the loss of individual property and livelihood, there is still no compensation for the loss of common property resources (CPRs).

Data cited in the case study, official data on those displaced, suggests that overall, people belonging to Scheduled Tribes (STs) constitute around 47.1 per cent of those displaced. If we include Scheduled Castes (SCs) who constitute 14.5 per cent of those displaced, then STs and SCs together constitute 61.6 per cent (around 62 per cent) of those displaced (See Tables 5.8 and 5.9, Rangachari et al.). It may be recalled that this group forms around 24.5 per cent of the Indian population. Further, the authors confirm that big landowners are the main beneficiary of access to irrigation water, as well as the hypothesis of increasing inequality (p. 214), to not only maintain current inequalities but often to exacerbate them. The impression given is that problems in dam building and irrigation systems are problems created by the Indian State itself. A more penetrating analysis might perhaps suggest that these problems have their origins in the way the Indian economy operates. But there is no doubt that these problems are proving extremely costly for the Indian people.

⁷ Shekhar Singh et al., Chapter 5, Rangachari et al.

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