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Strengthening environmental impact assessment in India : comparison of EIA in the United States, Western Australia, the Philippines, and India

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STRENGTHENING ENVIRONMENTAL IMPACT ASSESSMENT IN INDIA: COMPARISON OF EIA IN THE UNITED STATES, WESTERN AUSTRALIA, THE PHILIPPINES, AND INDIA

A Thesis

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by

Varinder S. Grewal

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Abstract

STRENGTHENING ENVIRONMENTAL IMPACT ASSESSMENT IN INDIA: COMPARISON OF EIA IN THE UNITED STATES, WESTERN AUSTRALIA, THE PHILIPPINES, AND INDIA

by Varinder S. Grewal

In the last three decades, environmental quality has declined severely and irreversibly in both developed and developing countries. In India, uncontrolled population growth, poverty, urbanization and industrialization without proper infrastructure, the abysmal state of sanitation and filth, and deforestation and unprofessional agricultural practices are creating most of environmental problems and pushing the nation toward ecological disaster. The main reasons behind these environmental problems are the bureaucratic and political hurdles, the general public's lack of understanding of environmental ethics, and government's lack of environmentally sound economic-policy making capabilities. Environmental Impact Assessment (EIA) could be used to address these issues. This thesis research has examined the adequacy of the existing administrative EIA procedures in India in comparison to the National Environmental Policy Act (NEPA) in the United States and different EIA models from other countries. Finally, eight recommendations, which would result in more effective implementation of EIA procedures in India, have been proposed in this paper.

Key Words: Environmental problems, Developed and developing countries, India, Urbanization and industrialization, Environmental impact assessment, and National Environment Policy Act (NEPA).

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OUR WORLD - ONE WORLD

Nature ... All things come to Thee,
have their being in Thee, and return to Thee.

■ Marcus Aurelius

Our Soil belongs also to unborn generations.

■ Sam Rayburn

Hast thou named all the birds without a gun?
Loved the wood-rose and left it on the stalk?

■ Ralph Waldo Emerson

... the fruit that the earth brings forth belongs
without distinction to all.

■ St. Gregory I

There are some who can live without wild things,
and some who cannot.

■ Aldo Leopold

There is life to be lived in the open,
with room for the soul to grow.

■ Everett Wentworth Hill

The tree which moves some to tears of joy
is in the eyes of others only a green thing
which stands in the way.

■ William Blake

There is something in the unruffled calm of nature
that overawes our little anxieties and doubts.

■ Jonathan Edwards

... therefore, we can't say that man will be
sensible enough not to destroy himself ...

■ Margaret Mead

CHAPTER 1

-Importance-

Human-induced development activities cause enormous degradation and make questionable our survival as a species. According to Holling (1978), "these alterations were undertaken in order to make the environment what was conceived as a better place to live in, and is now commonly termed as 'development.'" Today, the environmental problems resulting from "development" are not only local or regional, but global. The greenhouse effect and depletion of ozone in the stratosphere are having significant effects on all parts of complex natural systems. In the last three decades, environmental quality has been degraded very severely, both in developed and developing countries (Singh, 1990).

In 1971, a panel of experts convened by the Secretary - General of the U.N. submitted a report to the United Nations on the quality of the human environment. The report was a comprehensive analysis of the environmental problems experienced by both industrial and developing countries. According to the report, the compelling urgency of the "development" objective has given rise to different kinds of environmental problems. In the industrial, advanced countries, environmental degradation is largely due to "high level economic development ..., large productive capacities in industry and agriculture, the growth of complex systems of transportation and communication, and the massive urban

expansion" (Sherrod, 1972). On the other hand, the problems in developing countries are largely due to "the problems arising out of poverty or the inadequacy of development itself; and the problems that arise out of the very process of development" (Sherrod, 1972).

The environmental problems of developing countries occur as a result of inadequate development, lack of affluence, and lack of advanced technological knowledge. In the majority of the developing countries, the average living standard is near or below the poverty line and is further impacted by unhygienic conditions due to poorly managed sanitation and sewage facilities and improper housing facilities. Limited financial resources are the main obstacles to improving the living standard. To achieve self-sufficiency in economic growth and to solve environmental problems, development in itself is considered an optimal solution.

"As the process of development gets underway ... pesticides and fertilizers runoff from unprofessional industrial agricultural practices, soil and nutrients run-off from deforestation, industrial emissions, and the growth of the entire economic infrastructure of transport and communication have environmental consequences" (Sherrod, 1972). All of these problems can be dealt with through the implementation of sustainable development. Sustainable development requires incorporating environmental goals and objectives into economic development objectives.

Environment Impact Assessment (EIA) is widely recognized as one important sustainable development tool by which governments and the public can minimize environmental impacts (Rees, 1988). It requires the integrated use of social and natural

sciences principles to evaluate and incorporate social, political, technological, and economical factors into the environmental planning and decision-making. In recent years, industrialized nations have developed judiciary, procedural, administrative, and technological measures to protect the environment. Environmental considerations have been incorporated into the economic planning process through Environment Impact Assessment. For example, the National Environmental Policy Act (NEPA) has required the integrated use of social and natural sciences principles to reduce the environmental impacts.

Developing countries are also recognizing the importance of EIA as a way to help address environment degradation as a result of development. In these nations which are still struggling to provide enough food to their growing populations, environmental consequences tend to be neglected. India is an example of a developing nation with severe environmental problems and poverty issues, but which is also developing an EIA structure.

India has problems typical of developing nations, including rapid population growth, lack of understanding of environmental ethics, lack of teaching environmental studies as a required course in schools and universities, and bureaucratic structures insensitive to environmental concerns. These factors all conspire against making environmentally sound, economic policies. EIA provides a formalized structure for considering environmental impacts of human actions. However, in India, the EIA structure is very rudimentary and environment protection is difficult as agencies lack knowledge concerning environmental impact assessment procedures and systems. The general public, policy makers, and corporations must balance environmental protection with industrial and economic growth.

EIA is considered an effective tool in balancing these goals. To be effective, an EIA process should be institutionalized as a national level policy, as the National Environment Policy Act (NEPA) is in the United States.

NEPA has been considered very successful in the U.S. and has been adopted by developing nations such as the Philippines, who have followed the footsteps of the NEPA process. This thesis will compare EIA models from different countries: two developed, the United States and Australia, and two developing, the Philippines and India, to determine what aspects of NEPA have been most successful and determine how NEPA was adapted to different political structures. This analysis will produce recommendations to improve the existing EIA process in India and to make EIA a useful sustainable development tool.

CHAPTER 2

-Environmental Impact Assessment-

In the last century and a half, the combination of rapid population growth and the industrial revolution has caused significant environmental pollution and degradation that affects the health and well-being of humans and the viability of thousands of species of plants and animals. Human developments represent an intrusion into the overall balance that maintains the earth as a habitable place (Jain et al., 1994). Policy makers around the world have developed policies emphasizing economic growth of their countries while largely ignoring the environmental considerations in their planning. These decision-making mechanisms are sometimes effective for short-term economic growth but are inadequate for long-term sustainability of the earth. Even the World Bank has recognized the need to consider environmental impacts of projects in order to ensure economic sustainability (Westman, 1985).

How we can protect the environment while maintaining economic and industrial growth? In 1970's, the United States, the world's biggest exploiter of natural resources, came up with one approach and established the world's first comprehensive environmental protection law, the National Environmental Policy Act (NEPA). This Act gave birth to the idea of "Environmental Impact Assessment" (EIA). EIA is a process designed to incorporate environmental considerations into the planning process so that effective

decisions can be made which balance environmental protection and economic growth.

The meaning of the word "environment" is different for different people. But from the standpoint of EIA, environment includes first and foremost the abiotic and biotic world. "Integrated" EIA also includes the social environment (Westman, 1985). For example, in Canada, it includes the physical, biological, social, and cultural environment, and some provinces (Ontario, Newfoundland, Alberta, and Nova Scotia) even include the interrelationship among these different components. According to Lawrence et al., (1994), "a broad definition of the environment, encompassing both biophysical and socioeconomic aspects, including interrelationships, would seem to be the only means of ensuring that potentially significant effects are not ignored or discounted."

In order to perform an effective impact assessment, "it is necessary to identify the extent of change, including how 'big' the impact is over space and time, the significance of the change, and how 'bad' the impact is" (Cheney and Schleicher, 1982). In thinking about changes or impacts, it is important to identify not only the direct or indirect impacts, but also to include positive and negative impacts, short-term and long-term impacts, growth inducing impacts, and cumulative environmental impacts.

Measuring "impact significance" is important in the EIA process because it then helps direct planning and decision-making . The proposed action may be changed to avoid important impacts and EIA documents help the decision maker to choose the best possible solution.

The enactment of NEPA gave birth to a comprehensive EIA procedure based on natural and social sciences principles and full public participation. The NEPA approach is

highly flexible and easy to use. "It serves to facilitate the systematic, explicit, and substantive use of scientific and technological knowledge in a broadened consideration of decision-making choices and consequences" (Lawrence et al., 1994).

The NEPA has its own limitations. One of the drawbacks of the NEPA process is its failure "to appreciate the implications of value and ethical differences and social and political inequities in the quest for value-neutral planning and decision-making" (Lawrence et al., 1994). Also, it was designed in an affluent country, which may make it difficult to apply to developing nations.

Without abandoning the basic elements of the NEPA process, other countries have applied the NEPA model to their national situation. NEPA has been adapted for use in over 29 other nations (Westman, 1985), including India. This thesis is designed to analyze the current application of EIA in India and determine how it can be improved.

CHAPTER 3

-Theoretical Setting -

The phrase "environment impact assessment" has historical roots back to the nineteenth century. "In 1810, Napoleon issued a decree which divided noxious occupations into categories: those which must be far removed from habitations, those which can be tolerated even close to habitations, having regard to the importance of the work, to the nature and configuration of the soil, and to the importance of the surrounding dwellings" (Ashby, 1976). Current EIA procedures evaluate many aspects of a project's environmental impact, not only social, but biotic and abiotic (Westman, 1985).

Under NEPA, environmental decision-making must be a public process. However, according to Portney (1991) this is just one of "two major approaches to making public decisions or policies about the environment." These two approaches are:

1. Positivist Orientation.
2. Public Policy-making Process.

Positivist Orientation

In this approach, the individual researcher is assigned the responsibility of analyzing the environmental problem to determine a "factual and value-neutral" solution by using scientific (both natural and social sciences) techniques (Portney, 1991). Using the

positivist orientation, there are two ways of approaching environmental decision-making: a "cause and effect consequence" approach and a "prescriptive" approach (Portney, 1991). In the first category, the individual researcher uses quantitative analysis techniques to discover the "causes" of the environmental problem and the "effects" of the environmental policy, formulated to offset environmental consequences caused by the problem. Ways to avoid the similar environmental problem in the future are proposed. As an example, a researcher can use this approach to analyze what caused the toxic gas release in Bhopal, India in 1984, what kind of environmental protection policies have been developed to prevent the problem in the future, and what safety measures can be applied in the future.

In the second category, the "prescriptive" approach, the researcher uses very sophisticated analytic methods, such as simulation models or probabilistic risk assessment, to forecast what will happen in the future if the preventive measures or environmental policies are not adopted (Portney, 1991). For example, by using the simulation models, a researcher can predict the population of any country, during any time period in the future, at a given birth rate.

In both categories, the environmental decision is made on the implicit assumption that scientific methods can uncover solutions to most of environmental problems. Positivists believe science is the solution to all the problems and analytical techniques can be used in "undelineating several different alternatives that can be pursued to achieve the same desirable results" (Portney, 1991). Positivists do not allow any place for the general public in the decision-making. According to this view, the general public has no

knowledge of the complex components of the natural environment and cannot make efficient and effective decisions about environmental problems.

Public Policy-making Process

Another way to develop decisions about environmental problems is through the public policy-making process. Public policy-making process advocates believe that neither science nor positivists alone can provide a single best answer to complex environmental problems. Instead, "it suggests that the range of answers to a specific environmental problem can be wide, and that it is rather the process our public decision makers go through that will ultimately determine the kind of decision make" (Portney, 1991). Unlike the positivist orientation, public policy-making process requires direct public input. The citizen role in environmental decision-making is viewed as paramount because the public has more knowledge of its surroundings than the scientists. In other words, the public policy-making process is more descriptive. Rather than prescribing the best ways to make policy, it seeks to describe how policies have been made in the past and how they are likely to be made in the future, and for which public involvement is very important at all stages of planning (Portney, 1991).

There is no one perfect approach to solving complex environmental problems. EIA and decision analysts believe that both approaches must be combined to adequately address complex environmental problems (Chechile and Carlisle, 1991). "The use of scientific information can reduce the environmental problem to simple cause-effect relationship, and can facilitate a higher degree of rigor in impact prediction and

monitoring. Given serious knowledge and control limitations, many of the interrelationships considered in EIA cannot and should not be reduced to simple cause-effect relationships. In order to facilitate [effective] decision-making, EIA must also encompass the value-full realms of interpretation, synthesis, and evaluation" (Lawrence et al. 1994).

To better address environmental issues by combining science and public input, the National Environmental Policy Act (NEPA) s. 102 (2) (c) was enacted by the U.S. Congress in 1970. The Act requires project proponents to assess the environmental impacts of projects, plans, or legislation changes. NEPA incorporates both positivist and public policy-making approaches. One of the main objectives of this thesis is to analyze whether both these approaches are effectively implemented in the NEPA process, how well NEPA is being implemented in developing nations, and how NEPA can improve the EIA process in India.

CHAPTER 4

-Background To Thesis-

Problem Statement

There are several environmental protection laws in India, but implementation has been very weak for most of these regulations because of political corruption, growth oriented development policies, lack of environmental planning during economic planning, and poor public participation in the decision-making process. Current EIA practices in India are focused on large scale projects which are mainly funded by foreign donor agencies such as the U.N., the World Bank, and other international development organizations. But there is a need to incorporate EIA practices at all levels of development and procedural activities. Given the intense and increasing environmental degradation in India, it is critical to identify, develop, and implement feasible environmental protection laws that fit the social and political structure.

Objectives of Thesis

In order to develop recommendations to improve the EIA process in India in a way that fits with the current social and political structure, this thesis research has the following objectives: (1) to determine the facts relevant to India's historical, political, social, economical, and environmental structure which will dictate the type of EIA might

be most applicable; (2) to assess the adequacy of the current EIA model in India by comparing it with EIA procedures from Australia, the Philippines, and the United States; (3) to determine the features of other EIA models most applicable to India; and, (4) to develop recommendations for the design and adoption of an EIA process in India which would be an effective decision-making tool for sustainable development.

CHAPTER 5

-Methodology-

An environmental impact assessment is a public decision-making process. Several models have been developed to measure the effective implementation of EIA procedures. For the purpose of this study, two different approaches were evaluated to study EIA procedures in four countries. The first is the fifteen question, "EIA Evaluation Criteria," developed by Wood and Bailey (1994) to evaluate the Western Australian EIA process. The second is based on the "Control Mechanism" developed by Abracosa, Jenkins, and Ortolano (1987) for studying the Philippines EIA process.

Wood and Bailey (1994) suggested an "EIA Evaluation Criteria" (Table 1) to evaluate "the formal legal procedures, the arrangements for their application, and practice in their implementation in any EIA system and uses these to determine whether Western Australia's EIA system is worthy of emulation.... The focus of the criteria is on the EIA process more than on the substantive environmental consequences of its implementation; i.e., on measuring any tangible environmental benefits attributable to the process -- a task which is ... generally referred to as environmental auditing."

According to Abracosa, Jenkins, and Ortolano (1987), "The performance of many EIA programs in a variety of contexts can be explained using the 'control mechanisms.'" The concept was first developed for studying the effective implementation of the

Philippines "EIS System." According to these researchers, "in the context of EIA, control mechanisms consist of intra-organizational and inter-organizational processes and structures intended to assure that lead agencies (or project proponents) account for environment impacts in planning and decision-making." There are six control mechanisms (Table 2), and all of them are used in this study to evaluate EIA models from the United States (US), Western Australia (WA), the Philippines, and India. The brief description of EIA processes in the United States, the Philippines, and Western Australia is provided in Appendix A.

Data on EIA procedures in the US, Western Australia, and Philippines was based on the literature review of research articles published in international research journals and research books such as Environmental Impact Assessment Review, Environmental Professional, and Environmental Management. The detailed list is provided in Appendix B.

Data on India's social, political, and environmental problems, and EIA procedure was based on the literature review of articles published in national and international research journals and books, and the information published by the Ministry of environment and Forests (MOE&Fs) and Central Pollution Control Board (CPCB) of India. The detailed list of research articles is provided in Appendix B.

Next, the "control mechanisms" criteria was used to evaluate EIA models in each country, because in large part, this method covers most of the points in the "EIA Evaluation Criteria" (Chapter 7). Finally, eight recommendations to improve India's EIA process were generated (Chapter 8). These recommendations were based on the analysis

of EIA processes in four countries in Chapter 7 and the concept developed by R. B. Gibson (1993) for improving the Canadian EIA process. In his article, "Environmental Assessment Design: Lessons From The Canadian Experience," Gibson analyzed EIA processes in different provinces of Canada and suggested 'Eight Principles' to improve Canadian EIA (Table 3).

TABLE 1

EIA System Evaluation Criteria

1. Is the EIA system based on clear and specific legal provisions?
2. Does the EIA system cover environmentally significant projects and other actions at the appropriate level of scrutiny?
3. Is the consideration of the environmental impacts of alternative actions included in the EIA process?
4. Does the integration by the proponent of environmental factors into action design occur as part of the EIA process?
5. Is there screening of environmentally significant actions?
6. Is there scoping of the environmental impacts of actions?
7. Do EIA reports describe actions, the environments affected, predict impacts, and indicate their significance?
8. Are EIA reports publicly reviewed and does the proponent respond to the review?
9. Are the findings of the EIA report and the review central to the decision on the action?
10. Does monitoring of action impacts and compliance with environmental conditions take place and is it linked to the earlier stages of the EIA process?
11. Does consultation and participation, supported by rights of appeal, take place throughout the EIA process?
12. Does the mitigation of action impacts take place throughout the EIA process?
13. Are the costs of the EIA system acceptable to those involved?
14. Has the EIA system generated discernible environmental benefits?
15. Is the EIA system itself monitored and amended to incorporate feedback from experience?

Source: Environment Impact Assessment Review, 1994; 14: 37-59.

TABLE 2

Control Mechanisms Influencing EIA Implementation

Judicial Control:	court (or other super-ordinate body) has power to exert formal authority, but not direct control, over the lead agency (or project proponent) in relation to EIA compliance.
Procedural Control:	centralized administrative unit promulgates EIA procedures; compliance with these procedures occurs if the lead agency (or project proponent) considers the procedures valid and adopts them voluntarily.
Evaluative Control:	centralized administrative unit issues sanctions based upon an appraisal of lead agency (or project proponent) performance with respect to EIA requirements.
Instrumental Control:	multilateral or bilateral lending institution offers material incentives to the lead agency (or project proponent) in return for performance of requisite tasks, which include environmental impact assessment.
Professional Control:	project planners have professional standards and codes of ethical behavior that include undertaking environmental impact assessments.
Direct Public & Outside Agency Control:	citizen's groups and outside agencies apply pressure to influence the lead agency's environmental impact assessment, but outside the context of the above listed controls.

Source: Environmental Impact Assessment Review 1987; 7: 285-292.

TABLE 3

Eight Principles To Improve Canadian EIA Process

1. An effective environmental assessment process must encourage an integrated approach to the broad range of environmental considerations and be dedicated to achieving and maintaining local, national, and global sustainability.

2. Assessment requirements must apply clearly and automatically to planning and decision-making on all undertakings that may have environmentally significant effects and implications for sustainability within or outside the legislating jurisdiction.

3. Environmental assessment decision-making must be aimed at identifying best options, rather than merely acceptable proposals. It must therefore require critical examination of purposes and comparative evaluation of alternatives.

4. Assessment requirements must be established in law and must be specific, mandatory, and enforceable.

5. Assessment work and decision-making must be open, participative, and fair ... to ensure attention to environmental considerations in planning and decision-making and to open up decision-making to greater public involvement and scrutiny.

6. Terms and conditions of approvals must be enforceable, and approvals must be followed by monitoring of effects and enforcement of compliance in implementation.

7. The environmental assessment process must be designed to facilitate efficient implementation. ... [Because], a process typified by unnecessary uncertainties, inconsistencies, and delays will make the effective implementation of EIA harder to reach. Inefficiency is also an immediate enemy of the environment, if valuable work done in assessment decision-making is lost in weak reviews, compromised decision-making, or unimplemented conclusions.

8. The process must include provisions for linking assessment work into a larger regime including the setting of overall biophysical and socioeconomic objectives and the management and regulation of existing as well as proposed new activities.

Source: Environmental Professional 1993; 15: 12-24.

CHAPTER 6

-Recent Developments In The Use of EIA In India-

Humans have a long history of exploiting natural resources to improve the quality of human life. We use the term "development" for the use of natural resources. In the international economy, development is a necessity for the economic well-being of the country. However, mal-development of the international economy leads to over-industrialization, over-population, and agro-farming practices (Mishra and Mishra, 1990). "The economic development projects have grown in pace and scale, and their harmful consequences on the different natural spheres and human habitats have yet to receive due attention" (Singh, 1990). In India, recent development activities brought enormous economic benefits to the society which led to the over-extraction of natural resources and imbalances in natural ecosystems. New techniques based on the idea of sustainability can be developed through the use of the Environmental Impact Assessment (EIA) process to safeguard the natural wealth for the benefit of the present and the future generations. This approach can be adopted only after making conscious efforts to assess the nature and causes of environmental problems in India. In the following section, some historical background on India is given, the root causes of environmental problems are discussed, and the status of the EIA process is provided.

Historical Background

India is a land of different cultures, several languages, and various religions. Over the centuries, India has been influenced by other civilizations including Greeks, Scythians, Pathians, Afghans, Kushans, Jews, Muslims, and Christians. The roots of present-day Indian society go back to 3rd millennium B.C., with the evolution of Indus Valley Civilization. The Indus Valley Civilization was one of the ancient world's most sophisticated civilizations, and it flourished in the fertile flood zones of the upper Ganges. It covered present-day Pakistan and northwestern portions of India. About 1500 B.C., the semi-nomadic tribes of Aryans, who originally inhabited the Caspian Sea region, invaded the Indus Civilization. Aryans pushed the dark skinned Dravidians, the native inhabitants of Indus valley, further south and established the plains of Ganga as their permanent homeland. Over the next 2,000 years, Aryans developed a caste system, a strict hierarchy based on people's profession, which eventually evolved into the present-day Hindu religion (Rogers, 1992).

In about 500 B.C., Buddhism evolved in India from the teachings of Sidarth Buddha and spread throughout the country and beyond to Sri Lanka, China, Japan, and other southeast Asian countries. Until 600 A.D., Buddhism continued to have a strong cultural and social influence in India. By the 13th century, the powerful Mugal empire controlled the Indian subcontinent and ruled until the mid 18th century. "A final strand of cultural influence was introduced by the British, who held political sway in all the present-day countries of region, except Bhutan, Nepal, and the Maldives, from the 18th century until

independence in 1947" (Rogers, 1992).

Since independence in 1947, India has achieved a remarkable degree of success in terms of economic growth, industrial development, agricultural production, health, and social welfare. However, human induced activities have stressed the environmental quality in India, particularly through "uncontrolled population growth and consumption rates, industrial activities, unprofessional agricultural practices, and careless waste disposal" (Chechile, 1991). As a result, India, once the land of sacred rivers and spiritual mountains, has become the land of polluted rivers and unmanaged landfills.

India is the world's second most populated country with a population of about 950 million people and an annual growth rate of 1.9%. "Of India's total population, more than 25% are living in the cities. On average a fourth of this number lives in slums. In large cities, the percentages are even higher. In Bombay, more than 10 million people live in slums. Calcutta has half million pavement dwellers who live, sleep, cook and defecate on the roads -- a problem faced by all major cities" (INDIA TODAY, 1994). "In 1951, the per capita land availability was 0.854 hectare, but in 1983 this had dropped to 0.416 hectare" (Bowonder, 1986). Everyday, people from rural areas migrate to big cities in large numbers to fulfill their dreams of luxurious life-styles, which puts further pressure on the deteriorating environmental quality. In 1951, only 63 million people resided in urban areas; this numbers reached 156 million by 1982. Most Indian cities have scarce land available for garbage and waste disposal, and open drains serve as sewers (INDIA TODAY, 1994). Even with a growth rate of 1.0%, the population of India is projected by the United Nations to be 1,620 million by the year 2020 A.D.

As the population grows, so does unregulated industry. India is emerging as an industrial giant of the subcontinent. Modern technology has been developed to increase the industrial output. Industrial production accounts for about 25% GDP, with a growth rate of 5%. In 1990, the country's net export was $17 billion. In the past, like other developing countries such as China, Korea, and Taiwan, India had supported and pursued development strategies which emphasized labor-intensive industry. They recently have reconsidered their economic policies and moved from consumer manufacturing to the high technology consumer electronics and computer software industries. After 1990, India exported more than $10 billion worth of software and computer related products to the industrial nations. The Indian government has taken steps to encourage foreign investment. To facilitate the process of establishment, site-selection, and the development of new industrial estates, the central government of India has formulated sets of guidelines for the state governments to implement. However, the locations of the project sites are often near densely populated urban areas because of the availability of natural resources, easy excess to transportation, and proximity of a skilled workforce. These developing industrial infrastructures, along with uncontrolled urbanization, have given rise to a wide range of complex environmental problems including transportation, housing, air and water pollution, and the management and disposal of solid and industrial waste.

The growth of the transportation sector is considered an important element for rapid social and economic growth of any country. As a general rule, the number of vehicles is directly proportional to the human population (Assessment of Vehicular Pollution In Metropolitan Cities (AVPIMC), 1988-89). During the decade of 1981-1991, the number

of people grew from approximately 700 million to 900 million, and the number of metropolitan cities in India increased from 12 to 23. In the same time period, the number of registered vehicles jumped threefold (Central Pollution Control Board (CPCB), 1995). This threefold increase in vehicular population "vitiates the environment in the process by emanating obnoxious toxic pollutants in the surrounding atmosphere and thereby poses serious health hazards to biotic community" (AVPIMC, 1988- 89). The major concentrations of vehicles are in big cities, with 35% of the total number of vehicles in India. Table 4 represents the estimated vehicular emission load in Metropolitan Cities in 1994. Along with urbanization and the increase in vehicular population, narrow streets and houses close to the streets also contribute to the problem of urban congestion that exacerbates the problem of air pollution (AVPIMC, 1988- 89).

Water pollution is becoming acute in a number of regions of India (Bowonder, 1986). The major source of water pollution in India is sewage which comprises 90% of the pollutants; 10% comes from industrial and agricultural run off (Bowonder, 1986). "For decades, sanitation in India has been treated like, well, a dirty word. Municipal corporations, riddled with corruption and inefficiency, have bloated work-forces, garbage disposal fleets operate at a third of their capacity and there is a total lack of motivation -- or money -- to tackle even the most basic sanitation needs of the country's overcrowded cities. The spread of unauthorized slums in already congested urban areas and the visible lack of civic sense among Indians add to the growing mound of filth and disease which has turned the country into a gigantic cesspool.... Untreated garbage and sewage from domestic and urban uses, pesticide and fertilizer run off, siltation, and industrial discharge

flows into the rivers, leaches into the ground water, causes enormous pollution, and affects human and wildlife alike" (INDIA TODAY, 1994). The 1994 outbreak of bubonic plague revealed the horrific state of India's municipal waste disposal practices in the country's most populated areas. In Table 5, the state of garbage disposal practices in 9 Metropolitans of India is summarized.

This recent industrialization and urbanization in India has accelerated the degradation of the quality of the physical environment. It has also brought tremendous changes in people's perception about the use of the natural resources. Indian people have begun to realize that "development" has caused enormous pollution and deterioration, and that more stringent environment protection laws are required.

TABLE 4

Estimated Vehicular Emission Load In Metropolitan Cities In 1994

S. NO.	Name of the City	Particu-lates	SO2	Vehicular Pollution Load (Tons per Day) NOx	HC	CO	Total
1.	Delhi	10.30	8.96	126.46	249.57	651.01	1046.30
2.	Bombay	5.59	4.03	70.82	108.21	469.92	659.57
3.	Bangalore	2.62	1.76	26.22	78.51	195.36	304.47
4.	Calcutta	3.25	3.65	54.69	43.88	188.24	293.71
5.	Ahmedabad	2.95	2.89	40.00	67.75	179.14	292.73
6.	Pune	2.39	1.28	16.20	73.20	162.24	255.31
7.	Madras	2.34	2.02	28.21	50.46	143.22	226.25
8.	Hyderabad	1.94	1.56	16.84	56.33	126.17	202.84
9.	Jaipur	1.18	1.25	15.29	20.99	51.28	88.99
10.	Kanpur	1.06	1.08	13.37	22.24	48.42	86.17
11.	Lucknow	1.14	0.95	9.68	22.50	49.22	83.49
12.	Nagpur	0.55	0.41	5.10	16.32	34.99	57.37
Grand Total		35.31	29.84	422.88	809.96	2299.21	3597.20

Source: Parivesh, Newsletter, by CPCB, 1995.

TABLE 5

State of Garbage Disposal Practices In 9 Metropolitans of India

City	Garbage Generated (tons/day)	Garbage Cleared (tons/day)	Sewage Generated (m liters/day)	Sewage Collected (m liters/day)	Annual Municipal Budget (crore)
Delhi	3,880	2,420	1,800	1,260	Rs. 1,016.38
Calcutta	3,500	3,150	800	675	Rs. 250
Bombay	5,800	5,000	1,800	1,460	Rs. 2,346
Bangalore	2,130	1,800	275	250	Rs. 237
Madras	2,675	2,140	250	238	Rs. 145
Lucknow	1,500	1,000	400	250	Rs. 48
Patna	1,000	300	141	83.2	Rs. 15
Ahmedabad	1500	1,200	400	240	Rs. 270
Surat	1,250	1,000	130	70	Rs. 170

EIA Process In India

Introduction

After independence in 1947, provisions were enacted to protect the quality of the natural environment. Acts such as the Indian Panel Code, The Criminal Procedure Code, The Factories Act, The Indian Forest Act, and The Merchant Shipping Act have regulations and legal actions to address specific environmental issues. Shortly after the United Nations Conference on the Human Environment was held in Stockholm in June 1972, a series of environmental protection laws were passed for protecting air, water, flora and fauna, and other natural resources throughout the country. The government continues to consider and pass environmental laws. Some of the important laws are the Water (Prevention & Control of Pollution) Act of 1974, the Water (Prevention & Control of Pollution) Cess Act of 1977, and the Air (Prevention and Control of Pollution) Act of 1981.

The main purpose of these laws was to deal specifically with water and air pollution problems. In 1986, the Parliament enacted a comprehensive act, the Environmental Protection Act, designed to protect and enhance the quality of all aspects of the environment. The Environmental Protection Act of 1986 is an umbrella act which supersedes all the previous legislation and holds the central government fully responsible to protect and improve the environment. For the purpose of this act, the word "environment" includes:

> "... water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property."

Environmental Impact Assessment (EIA) Notification

On January 27, 1994, the Ministry of Environment & Forest (MOE&Fs) issued a Notification which made EIA a statutory requirement for specified activities. This notification was amended on May 4, 1994, and the amended version includes a self-explanatory note detailing the procedure for obtaining environmental clearance, technical information/documents to be submitted at the time of applying for environmental clearance, and cases which are likely to exempted from obtaining environmental clearance (Annual Report, MOE&Fs, 1995).

Like the definition of "environment," the definition of "proposal or project" also varies from country to country or from one EIA law to another. For example, in Western Australia, a proposal means "project, plan, program, policy, operation, undertaking or development or change in land use, or amendments of any of the foregoing." In case of India's EIA model, the meaning of "proposal" is somewhat limited in context. An impact assessment is a requirement for 29 specified activities as listed in Schedule-I of the notification (Table 9). However, there are certain activities which are exempted from impact assessment.

If a proposal is the extension or modernization of any industry or if a project is listed under Schedule-I and is not exempted, the project proponent is required to refer the proposal to the Impact Assessment Agency (IAA) for assessment. The referral can occur simply by submitting an application form, included in Schedule-II of the notification, and "[it] shall be accompanied by a project report which shall, iter-alia, include an

Environmental Impact Assessment Report/Environmental Management Plan prepared in accordance with the guidelines issued by the Central Government in the MOE&Fs from time to time" (EIA Notification, 1995). The application which is submitted to the IAA by the proponent should provide enough information to be evaluated and assessed by IAA before issuing an Environmental Clearance Certificate. If the IAA considers that the information submitted is insufficient, then the committee can send the proposal back for revision or can consult the committee of experts. The IAA is the Union Ministry of Environment & Forests and the committee of experts shall be constituted by the IAA (Table 6).

So far, the committee of experts has been constituted for the following activities:

- Mining Projects
- Industrial Projects
- Thermal Power Projects
- Nuclear Power and Related Projects
- Transport, Tourism and Miscellaneous Projects
- River Valley, Multipurpose Irrigation and Hydro-electric Projects.

Once an application is deemed complete by the IAA, then the IAA and/or committee of experts shall evaluate the environmental consequences of the proposed project based on the data furnished by the proponent and "supplemented by data collected during visits to sites or factories, if undertaken, and interactions with affected population and environmental groups, if necessary" (EIA Notification, 1995). Based on the outcomes of the findings, the IAA or committee makes recommendations to the Minister of Environment & Forest for approval or rejection.

In certain cases, if the proposed project is in an environmentally sensitive area such as

wetlands, river basins, sanctuary, an environment site clearance certificate is required before applying for environment clearance certificate.

In the following cases, both site clearance and environment clearance are required:

- Mining
- Pit-head thermal power stations
- Hydra-power, major irrigation projects and/or their combination including flood control
- Ports and harbors (excluding minor ports)
- Prospecting and exploration of major minerals in areas above 500 ha.

The IAA and/or committee of experts shall complete their assessment within ninety days from the receipt of the application and additional information required under the notification and conveyed their decision within thirty days thereafter. The EIA notification in India provides the general public full access to review the project information, summary of reports, EIA document, and EIA management plans based on which the clearance is given.

Status of Clearance Given To The Projects in Year 1994

According to the statement issued by the Ministry of Environment & Forests in its Annual Report (1995), "during the year of 1994 five hundred and ten (510) projects were received for environment and site clearance. Required information was also received in respect of most of the 89 projects pending at the beginning of the year. Four hundred and twenty nine (429) projects were appraised/re-appraised during the year, out of which one hundred and four (104) projects were granted environment and/or site clearance." Table 7 gives the number of projects attaining approval.

After a project is cleared and is implemented, the IAA is required to monitor the procedures and safeguards to which that proposal was subject. The cleared projects are monitored through the six Regional Offices of the Ministry.

TABLE 6

Composition of The Expert Committee for EIA

1. The committee consists of experts from the following disciplines:
   - Ecosystem Management
   - Air/Water Pollution Control
   - Water Resource Management
   - Flora/Fauna Conservation and Management
   - Land use Planning
   - Social Science/Rehabilitation
   - Project Appraisal
   - Ecology
   - Environmental Health
   - Subject Area Specialists
   - Representatives of NGOs/Persons concerned with Environmental issues.
2. The chairman will be an outstanding and experienced ecologist or environmentalist or technical professional with wide managerial experience.
3. The representative of IAA will act as Member Secretary.
4. Chairman and member will serve in their individual capacities except those specifically nominated as representatives.
5. The membership of a committee shall not exceed 15.

Source: EIA Notification, 1995.

TABLE 7

Status of Development Projects (From 1.1.94 to 12.31.94)

S. No.	Development Sector	Projects Pending at the beginning of the year	Projects Received	Projects* Appraised	Projects Cleared	Projects Rejected	Additional Information Sought
1.	(a) Mining Projects	29	46	25	13	5	57
	(b) Mining Projects (Site Clearance)	Nil	320	217	24	210	86
2.	Industrial Projects	18	48	27	20	7	39
3.	Atomic Power Projects	Nil	1	1	Nil	Nil	1
4.	Thermal Power Projects	14	29	55	15	4	24
5.	River Valley Projects	4	31	47	8	16	11
6.	Other Sectors (including Transport, Ports, Tourism, Harbors, Airports, Highways, Communication Projects)	24	35	57	24	5	30
Total		89	510	429	104	247	248

* Some of the Projects have been appraised more than once.

Source: Annual Report, MOE&Fs, 1995.

CHAPTER 7

-Discussion-

Different countries have developed EIA models according to their unique needs. EIA is considered to be effective when environmental effects are evaluated by using social and natural science principles and techniques, mitigation measures are adopted to minimize or eliminate the adverse significant effects, monitoring provisions are included after the project goes into operation, and an EIS is prepared and distributed for public comments. In some of the countries where EIA procedures are well established, the administrative rules and regulations governing EIA are effective at least in fulfilling procedural requirements and addressing some substantive issues. But in other countries where EIA is performed on an ad hoc basis to obtain financial assistance from international donor agencies, authorities are forced to perform formal assessment just to meet the regulatory requirements of international agencies and, in the process, tend to ignore environmental considerations in their planning.

As explained in Chapter 3, the method of "Control Mechanisms" is used to evaluate EIA processes in 4 different countries. In this chapter, the "Control Mechanisms" are used to analyze and discuss the effectiveness of EIA processes in the U.S., Western Australia, the Philippines, and India.

According to Abracosa, Jenkins, and Ortolano (1987), "The performance of many

EIA programs in a variety of contexts can be explained using control mechanisms." They first developed the concept for studying the effective implementation of the Philippines EIS system. In the following section, these control mechanisms are used to evaluate the effective implementation of the EIA processes in the United States, Western Australia, the Philippines, and India.

Judicial Control

Judicial controls exist when a court or a central government expert committee or any other super-ordinate body has no explicit power to interfere or change the government agency decision, but has implicit power to evaluate whether the agency decision is in compliance with the law, such as in the case of a complaint filed by an individual, a group of citizens, or a non-profit environmental organization. "The U.S. experience with citizen litigation over implementation of NEPA provides a telling demonstration of how the judicial control mechanism, combined with environment public activism, has yielded a high rate of procedural compliance with EIS requirements" (Abracosa and Ortolano, 1987).

Throughout the course of NEPA history, the courts have exuberantly participated in reviewing federal agency compliance with NEPA requirements. Neither NEPA nor its guidelines provide the courts with any direct jurisdiction to review federal agency decisions. Generally, the courts themselves found indirect jurisdiction with the assistance of other statutes, such as the Administrative Procedure Act (APA). However, in two landmark cases, *Environmental Defense Fund v. Hardin* and *SCRAP v. United States*, courts found that the language of NEPA alone was sufficient to bestow jurisdiction for

judicial review (Anderson, 1973). The Act's requirement of compliance "to the fullest extent possible" became one of the commandments giving courts the jurisdiction over NEPA implementation.

Another reason for the courts' willingness to review agency decisions is that the general public has been granted full public participation in environmental decision-making and "standing" to sue the federal government in the case of alleged violation of Act's substantive and procedural intent (Abracosa; Jenkins; Ortolano, 1987). The enactment of NEPA expanded the general public's right to participate in the environmental decision-making process, the public's right to know whether environmental impacts of the alternatives were evaluated, what the criteria were for the federal agency's final decision, and whether the interests of future generations had been considered (Anderson, 1973).

In Western Australia, there is no direct provision which provides the court and other super-ordinate bodies with the ability to change a government agency's decision. However, the Environmental Protection Act of 1986, "provides provisions for all concerned parties; decision-making authority, general public, or project proponent, to file written appeals with the Minister for Environment." From project application to project implementation, there are five stages where one can file an appeal. All the concerned parties can file appeals if they disagree: (1) with the decision of the Authority; (2) with the level of the assessment of a proposal disclosed in the public record; (3) with the content or recommendations contained in the EIA assessment report; (4) with any of the conditions and procedures set on their proposal by the Minister, prior to the decision being implemented; and, (5) with the Minister exercising one of the powers granted to him/her

listed in the Act, in respect of non-compliance with conditions to appeal (Bailey and Brash, 1989 and Bailey and English, 1991).

In the Philippines and India, judicial controls are non-existent. There is no provision for general public to file appeal or complaint, either through the court or through the Minister for Environment. As in the case of the Philippines, "the lack of a broadened concept of 'standing' in ... judicial system makes it difficult for environmental groups to challenge agency decisions in the courts.... There are no environmental groups with the political and material resources needed to bring environmental lawsuits against Philippine agencies. Moreover, there is no precedent for government agencies being brought to court through third-party litigation, something that would be required in the case of EIS lawsuits based on alleged failure to conduct EIAs" (Abracosa and Ortolano, 1987).

The situation in India may be even more difficult. In India, the Environmental (Protection) Act of 1986 restrains any Indian citizen or environmental organization or decision-maker to file a suit "against the Government or any officer or other employee of the Government or any authority constituted under this Act or any member, officer or other employee of such authority in respect of anything which is done or intended to be done in good faith in pursuance of this Act or the rules made or orders or directions issued thereunder."

Procedural Control

The second type of control is procedural. Procedural controls consist of statements of rules and regulations and policies and procedures established by the environmental act,

which federal agencies are required to follow for legal EIA implementation. "Procedural controls can lead to effective EIA if the organization [or agency] responsible for implementing the procedures considers the controls valid and adopts them voluntarily" (Abracosa; Jenkins; Ortolano, 1987).

NEPA specifies all the rules and procedures to be followed for effective implementation of the Act. Title I assigns the federal agencies the legal responsibility to formulate policies, procedures, rules, and regulation in accordance with the policies set forth in the NEPA, so that the objective of protecting the environmental quality could be achieved. The law also requires federal agencies to improve on the "deficiencies and inconsistencies," if any, in their policies and procedures "... which prohibit full compliance with the purposes and provisions of the Act" (Sec. 103). The law covers all the main stages in the EIA process and lays down all the substantive and procedural details to be covered from project proposal to project implementation. In addition to the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) also enacted NEPA guidelines to guide the process of proposal evaluation, impact assessment, scoping, screening, and time limits. NEPA requires the federal agencies to prepare an EA/FONSI (Environment Assessment/Finding of No Significant Impacts), if the environmental impacts are less than significant or are mitigated to less than significant, and an EIS (Environmental Impact Statement) if the environmental impacts have potential significance. The main feature of the Act is to provide the general public the legal right of "standing" to file a suit against the federal agency if the information provided in the EIA document is not in compliance with the NEPA requirements. Even though short in length,

the six page National Environmental Policy Act provides enough statutory support to ensure the effective EIA implementation in the U.S.

In Western Australia, the Environmental Protection Act of 1986, specifies guidelines for how the proposal should be evaluated, what kind of EIA document should be prepared, when and which document should be distributed for public scrutiny, what procedures should be followed during the project implementation, and what procedures should be adopted to file a appeal to the Minister. However, the procedural controls in Western Australia are not as effective as in the U.S. because they are not accompanied by other types of controls (judicial, evaluative, or instrumental controls). As Abracosa, Jenkins, and Ortolano (1987) documented, "procedural controls will generally not yield effective EIA unless they are accompanied by either judicial, evaluative, or instrumental controls."

In the Philippines, and India, procedural controls are ineffective primarily because procedural guidelines are not incorporated in the Acts themselves. As in the case of India, the EIA "includes a self-explanatory note detailing the procedure for obtaining environmental clearance, technical information/documents to be submitted at the time of applying for environmental clearance, and cases which are likely to be exempted from obtaining environmental clearance from MOE&Fs in order to facilitate the submission of complete applications for environmental appraisal" (Annual Report, MOE&Fs, 1995). However, these guidelines vary from time to time and from project to project. Also, in the absence of judicial, evaluative, instrumental, and public participation control mechanisms, the implementation of the procedural guidelines is very inadequate. The government

agencies may also be unreceptive to new rules and procedures. They consider environmental decision-making a political process, and incorporating control mechanisms in decision-making is an age-old mechanism of imposing rationality on their political behavior, which they oppose, and so they find no incentive in implementing any of these control mechanisms.

Evaluative Control

The evaluative controls require a centralized body under the command of the federal government to assess whether the federal agencies performed the tasks and followed the procedures as established by the Act. Successful use of evaluative controls depends upon the central body's technical, political, and administrative capabilities in influencing agency decisions and imposing sanctions in cases of non-compliance.

In the U.S., the responsibilities of evaluative controls lie with the Council on Environmental Quality (CEQ), appointed by the President of the United States. NEPA defines the tasks needed to be performed for EIA implementation, but it does not define the specific way its requirements should be implemented or conducted. "To remedy this situation, the Council on Environmental Quality (CEQ) ... has published *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*" (Murthy, 1988). These regulations are published in Title 40 of the Code of Federal Regulations as 40 CFR 1500-1508. Generally, evaluative controls require the lead agency to prepare a draft EIS and consider environmental elements along with economic, technical, and political factors so that effective weight could be given to the environmental

impacts in the agency's final decision.

After three decades of NEPA implementation, evaluative controls appear ineffective in ensuring effective implementation of intent of Title of the Act and CEQ guidelines (Trulio, per. comm., 1996). The main reason for poor evaluative controls implementation is that the CEQ has no direct control over agency decisions. It can only "formulate and recommend [stringent] national policies to promote the important of the quality of the environment" (Sec. 202).

In Western Australia, a centralized body, the Environmental Protection Agency (EPA) has the statutory responsibility for assessing agency EIS implementation. After the proposal is submitted by the project proponent, the EPA decides whether an EIS is required and, if so, what level of assessment is required. The EPA also provides guidelines about the content and issues to be covered in the EIS. "An important aspect [or one can say a major flaw] of evaluative control in the Western Australia is the role of administrative discretion in determining when and what type of EIS is required.... This has resulted in a low level of EIS preparation in [Western] Australia compared to the United States" (Abracosa; Jenkins; Ortolano, 1987).

In the Philippines, the NEPC (National Environmental Protection Committee) has an oversight role in EIS System implementation. Under Philippine law, the NEPC is required to evaluate the EIA documents prepared by the project proponent. Based on its appraisal, the NEPC can either allow the project to proceed by issuing an Environmental Compliance Certificate (ECC) or it can reject the proposal. In most of the cases of disapproval, project proponents ignore the NEPC's decision and proceed with their development

anyway (Abracosa; Jenkins; Ortolano, 1987). They know that in the absence of judicial and direct public and outside agency controls, the NEPC has no political power to stop the projects they did not approve.

In India, the procedures are somewhat similar to the Philippines. Project proponents are required to obtain an Environmental Clearance Certificate and/or Site Clearance Certificate, in some cases, from the Impact Assessment Agency (IAA). The IAA is the centralized body which oversees the EIA process. The IAA officials and/or committee of experts has full authority of "entry and inspection of the site or, as the case may be, factory premises at any time prior to, during or after the commencement of operations relating to the project" (EIA Notification, 1995).

Professional Control

"Professional control exists when the professional attitudes of planners lead to the conduct of EIAs: that is, EIA is motivated by the internalized values of planners resulting from the expert knowledge and ethical standards that their training and experience instills" (Abracosa; Jenkins; Ortolano, 1987). However, professional controls have never been used explicitly in any one of these four countries (the U.S., W.A., the Philippines, or India) to promote EIA.

During the early years of NEPA, most of the federal agencies tried to avoid EIS guidelines. Most of the agencies attempted "to avoid preparing an impact statement by finding that the action is not 'federal,' is not 'major,' does not 'significantly affect the environment' or even is not yet an 'action'" (Anderson, 1973). In the last ten years,

lengthy EISs have been prepared by federal agencies, not because of professional controls, but because of fear of getting sued by the private citizens and/or other federal agencies.

In India and the Philippines and in other developing countries, the concept of professional control is non-existent. Public participation is prevented, knowledge of the value of ecological wealth is lacking, and political and public official cultures are corrupt. Abracosa and Ortolano (1987) documented, "some Filipino water planners were motivated to predict environmental impacts as a check on the technical feasibility of proposed projects." However, in general, the impact assessment was conducted on ad hoc basis to obtain funds from the international donor agencies.

Instrumental Control

Instrumental Control occurs when a "multilateral or bilateral lending institution offers material incentives to the lead agency (or project proponent) in return for performance of requisite tasks, which include environmental impact assessment" (Abracosa; Jenkins; Ortolano, 1987). Before the enactment of EIA procedures as a legislative act in India, the Philippines, and other developing countries, these procedures were performed on an ad hoc basis to obtain loans or monetary help from the international donor agencies such as the U.N., the World Bank, USEPA, and the Asia Development Bank. In recent years, these multilateral or bilateral donor institutes have made it a mandatory requirement that countries applying for money are required to protect the environment through a legislative act. In response to the requirements of the multilateral agencies, both India (1994) and the Philippines (1977) have enacted EIA as a mandatory requirement for any kind of a

project or proposal having the potential of causing significant environmental consequences. In those developing countries where EIA is still performed on ad hoc basis, instrumental controls play an important role in EIA formulation and implementation.

Direct Public and Outside Agency Controls

As is clear from the discussion of other control mechanisms, the public plays a significant role in promoting effective EIA implementation by using or promoting judicial, procedural, and evaluative controls. Based on their appraisal of environmental documents, outside agencies can also directly influence the lead agency decision "to conform more closely with [their] interest" (Abracosa; Jenkins; Ortolano, 1987).

Besides the use of controls, there are other direct and indirect ways that the public can participate in decision-making or public policy formation, such as:

1. Indirect participation by mobilizing their opposition through mass-media.
2. Voting to elect political representatives with environmental protection on their election agendas.
3. Voting to pass a referendum.
4. Selecting a public representative to the decision-making body.
5. Taking part in activist nonprofit organizations.
6. Engaging in open protest (strikes, march, etc.) to block projects.

In W.A., the Philippines, and India, the direct public and outside agency controls are not as effective as in the U.S. (Abracosa and Ortolano, 1987; Abracosa, Jenkins, and Ortolano, 1987; Bailey and Brash, 1989). In general, lack of interest by the people in public participation and lack of the right of "standing" to sue the federal government are

the main reasons for ineffective implementation of direct public and outside agency controls. In the following section, the role and effects of the public participation in the U.S. and India are discussed in detail.

Public Participation In The U.S. and India

The United States

The U.S. has a long-standing history of citizen participation in the public policy-making process. For example, until the 1960s, the growth of industry was considered critical for the continuous economic growth of the country. However, this perception changed in the early 1970s "because the public began to realize that smoke is not so innocent as it looks, and it pollutes the air slowly and sometimes irreversibly" (Murthy, 1988). The public believed that the major problem causing pollution was poor regulation of industry which created most of the air and water pollution problems. In response to growing public frustration about environmental problems, Congress realized that the public should have more access to government decisions regarding the location and the operation of any kind of federally proposed action which has the potential of causing significant environmental effects. As a result, the National Environmental Policy Act (NEPA) was enacted in 1969. The provisions for public involvement at all stages of the planning process are explicit throughout the language of NEPA. The Act requires the federal agency to provide all required information to the public on all the actions having the potential of causing environmental effects on the health and well being of the physical and human environment.

The Freedom of Information Act is another unique and landmark law passed in the United States. Under this law, the public has full access to all the information available regarding all kinds of government decisions unless confidentiality can be justified. This gives citizen groups access to a wide variety of environmental information, even though there are many loopholes through which governments and private industry scurry to protect their interests (Sewell and O'Riordan, 1976).

India

Throughout the world, the definition of the word "democracy" is "government of the people, by the people, for the people." It is true that India is the world's most populous democratic country, but, in practice, the definition of the word "democracy" does not completely fit this definition. In general, votes are cast even before the individuals or voters arrive at the polling stations. The police has sanctioned unlimited power and corruption is a way of living. One can define "democracy" in India, as "government of the politicians, by the criminals, for the public funds" (Bettmann, 1974). In India, there are no laws like the National Environmental Policy Act or the Freedom of Information Act which can help the public gain access to the government decision-making process. In 1994, the EIA process was enacted as a statutory requirement to assess the social, economical, and environmental consequences of a proposed project. The act provides the general public full access to the federal agency's environmental decision-making mechanism and the information based on which decision is being made. Generally, public review does not occur. The environmental documents are often withheld for their confidentiality.

However, in those cases where environment documents are available for public review, the public is not allowed to file complaints against the central government or any of its officials if there is a violation of assessment requirements. Generally, as Bailey (1987) commented, "in environment impact assessment (EIA) there is a common belief that by the time an environment impact statement (EIS) is released for public comment the proposal is so well advanced that significant modifications are unlikely to be achievable. Non-approval of the proposal is perceived to be even less likely" which is also true in case of India.

Even though, the EIA notification encourages full public participation in environmental decision-making, but, both the advocates of the public policy-making process and positivist orientation advocate public participation to fulfill their political goals. As Ahmed (1994) stated, "The government of India supports participation when it chooses to do so, and in this sense manipulates, largely in its own interests, to gain votes and political supports...." Importantly, most of the environmental regulations are designed by the politicians and the central government officials in New Delhi, the nation's capital, and "... in their definition of the 'problem' and the 'people,' they assume that the country is a monolithic, socially homogenous unity, an approach which ignores the role of calls, caste or gender differences in the process of participation."

People from different religions have different values associated with the components of the natural environment. Therefore, the definition of "pollution" for one community may not be same for the others. "For millions of Hindus who bathe in Ganga every day, the so-called 'polluted waters' are pure and cleansing -- the living waters of the River of

Heaven -- so that the Ganga, even when actually (continently) dirty, never (necessarily) is. However, for Muslims, the river Ganga is sacred but not pure like Hindus" (Ahmed, 1994). As Ahmed quotes Eck (1982) who says that "A question here ... is not really the purity of the Ganges, but the cultural understanding of what it means for something to be pure or impure, clean or dirty."

Another major flaw in the presently adopted EIA process is the central government agency's faith in its own rational and technocentric knowledge, which fails to include other systems of knowledge (Ahmed, 1994). The Indian process is highly "positivist" and positivist technocentrics believe that the public has nothing to offer to the technical aspects of the development project, and that it will make the decision-making process more lengthy and costly instead, diverting the agency's attention from its primary objectives.

Lack of interest may be another reason for public non-participation in environmental decision-making. The majority of Indian people belong to the middle or lower middle class. They do not pay much attention to the issues of environmental protection for fear of losing their livelihoods. Like the government itself, the people of India have also become self-centered. The public also lacks knowledge regarding the complexity and the value of the ecosystems. This problem is further worsened by the education system of India, because most of the schools, colleges, and universities do not offer courses in environmental studies/science.

The role of NGOs, the non-governmental organizations, is applauded by both positivists and public policy-makers because their participatory efforts "are based on

religious and cultural symbolism associated with the beliefs of the local people which represents an environment of trust for the believer" (Ahmed, 1994). The NGOs in India work within the socio-economic and politico-administrative framework of the government and do not provide any kind of threat to the country's political institution. In spite of the remarkable achievements by the NGOs in protecting and enhancing environmental quality, their efforts are under-funded and are usually ignored due to the ineffectiveness of "judicial" and "public and outside agency" control mechanisms.

TABLE 8

Summary of Effective Use of Control Mechanisms in the Four Countries

	United States			Western Australia			Philippines			India		
	Effective	Moderate	Not Effective	Effective	Moderate	Not Effective	Effective	Moderate	Not Effective	Effective	Moderate	Not Effective
Judicial Control	✔			✔					✔			✔
Procedural Control	✔				✔				✔			✔
Evaluative Control		✔			✔				✔			✔
Professional Control			✔			✔			✔			✔
Instrumental Control	NA	NA	NA	NA	NA	NA	✔			✔		
Direct Public and Outside Agency Control	✔				✔				✔			✔

CHAPTER 8

-Conclusion And Recommendations-

As discussed in Chapter 3, there are at least two major approaches to making public decisions or public policies about the environment, the positivist orientation and the public policy-making process. Both these approaches are similar in problem formation and results prediction but are different in the way the final decision is achieved. The analysis of the EIA processes in 4 countries (Chapter 7) confirmed that neither approach is perfect for solving the complexity of our environmental problems; rather, the views of both positivists and public policy makers should be included in any EIA model for its effective implementation. Based on the analysis in Chapter 7 and the concept developed by R. B. Gibson (1993) to improve Canadian EIA, as explained in Chapter 5, "8 rules" are recommended to improve India's EIA process and are described here in the following section (Table 11). The following recommendations make great sense in India and other developing countries where EIA is in its early stages of development. "Countries that are creating, or are about to create, an EIA system should also find them useful, though a thorough review of environmental policies, capabilities, and institutional structures should be carried out first" (Smith and Wansem, 1995).

RULE I

An effective EIA model must encourage an integrated use of social and natural sciences principles, techniques, or methods to analyze a broad range of complex environmental problems.

Positivists believe that integrated use of scientific techniques can produce the "value-neutral" results. On the other hand, the public policy-making process advocates claim that "politics" or "interpersonal value" based interactions can determine the best possible solution. In practice, both these views are essential for the effectiveness of any EIA. However, the National Environmental Policy Act incorporates the views of both positivists and public policy-making process.

The National Environmental Policy Act is one of the most fascinating and far reaching environmental laws passed in the United States. NEPA has resulted in achievements in protection and enhancement of the environmental quality in the U.S. and the countries who have followed its footsteps. The law brought significant changes in federal agencies' bureaucratic policy making mechanisms. It facilitates the systematic, explicit, and substantive use of social and natural sciences ideas and also requires consideration of environmental factors along with political, economical, and technological factors to make planning and decision-making ecologically rational.

Even though the word "science" is used only three times in the entire NEPA document, the concept of using scientific knowledge is embodied throughout the language of the Act. Title I and Title II of NEPA can be easily interpreted as requiring scientific concepts. Bartlett (1986) sensed and explained the use of scientific ideas in Section

101(b) of Title I in his article. For example, as in point 4 of Section 101(b) of Title I, Bartlett documented, "preservation of important historic, cultural, and natural aspects of national heritage and maintenance of an environment supporting diversity and variety of individual choices (using knowledge and methodologies from archeology, cultural anthropology, cultural history, geography, and ecology)." Similarly, in point 6, Bartlett noted, "enactment of the quality of renewable resources and maximum recycling of depletable resources (requiring application of a developed material science, resource economics, recycling engineering, and environmental management science)."

Similarly, Section 102(c) provides a tool to implement the goals and objectives set forth in Section 101(a) of Title I, through the use of environmental impact statement. The EIS is a pivotal link between science and decision-making. It requires all federal agencies to:

> (A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment;
>
> (B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality ..., which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic and technical considerations;
>
> (F) lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment; and
>
> (H) initiate and utilize ecological information in the planning and development of resource-oriented projects (Section 102).

Title II, establishing CEQ also mirrors the intent of the Congress to "appraise programs and activities of the Federal Government in the light of the policy set forth in

Title I of this act ... by conducting investigations, studies, surveys, research, and analyses relating to ecological systems," all of which require a comprehensive use of scientific and technical knowledge. In short, NEPA represents a set of procedures which "aims to make knowledge useful, and used, and to make inherently political processes more ecologically rational" (Boggs, 1991b). Gunnel (1981) further emphasized the importance of scientific principles in public policy-making, "scientific method is often held as the paradigm of rationality, and it is apparently widely believed by scientists and laymen alike that the world could be vastly improved if only politics were made more like science." And in part, science is important simply because information is important -- science, is, after all, a particular approach, perhaps the best we have, to reducing the ambiguity of evidence (Bartlett, 1986 and Boulding, 1981).

Along with ecological rationality, NEPA also accentuates the integration of other provinces of rationality, such as economic and social rationality, legal rationality, and political rationality. The implication of these other realms of rationality is explicit and implicit throughout the text and logic of NEPA.

On the other hand, some commentators believe NEPA may be misguided in this approach. In their views "[NEPA] simply represents the latest in an age-old line of mistaken and failed efforts to introduce rationality into politics" (Bogg, 1991b). According to Bogg (1991b) and Friesema and Culhane (1976), "... public administrative behavior is not scientific management; it is politics." The "expectation that NEPA will cause federal agencies to produce scientific, holistic, optimizing, evaluating, mitigating, and coordinating policy is no more than the latest manifestation of the rational decision-

making perspective on bureaucratic behavior -- a perspective that political scientists have long found unrealistic" (Bogg, 1991b; Friesema and Culhane, 1976; and Baber, 1988).

The concept of integrating science into policy and decision-making has been a controversial issue since the birth of NEPA. "NEPA does not preempt the political or administrative roles of government decision makers. NEPA was not merely or even primarily an attempt to force bureaucracies to use science -- like analysis as a basis for policies and decision. It was not just science that NEPA mandated in 1969, but a systematic, interdisciplinary, integrated use of the natural social sciences, with an emphasis on ecology" (Bartlett, 1986). The statements of Bogg, Friesema, Culhane, Baber, and others do not demonstrate that NEPA is an ineffective decision-making tool. However, they help elucidate the problems with the integrated use of social and natural scientific knowledge in policy. Generically, as Caldwell (1988) stated, "[NEPA] is an aspect of the information revolution of our time in which knowledge is becoming an increasingly powerful force in politics." Therefore, the success of the EIA process, based on the principles of NEPA, whether it is in the U.S. or in India, can be "best understood and evaluated if it is viewed as an exercise in policy and institutional design -- a 'natural experiment' in the institutionalization of rationality in government organizations" (Bartlett, 1986).

RULE II

Democratic and fair participation of all the concerned parties must be allowed in the environmental planning and decision-making.

As with the use of "scientific principles," the importance of "public participation" in public environmental decisions is another area of concern between positivists and public policy-makers. Each of these two camps have their own definitions of the limits of public participation in decision-making. "From a positivist's perspective, expert roles are of paramount importance. Decisions at all stages of the policy-making process are to be made by the people who know the most about the technical side of the environment" (Portney, 1991). Positivists believe that decisions made through a public policy approach with the maximum public involvement suffered serious scientific flaws because the public does not have the background and technical knowledge about the complex natural environment and scientific principles to make an effective contribution.

On the other hand, for public policy makers, the public environmental-policy making is purely a political process, and in a democratic society public involvement in the political process is not only inevitable but is unavoidable. It suggests that whether or not it is sound science for the general public to make decisions, the general public or some segment of the general public is, in fact, charged, either directly or indirectly, with the authority to influence such decisions" (Portney, 1991).

"In India, any kind of indigenous EIA model will work," according to Dr. R. B. Singh, professor of Geography at University of Delhi, India (Singh, per. comm., 1995). According to Dr. Singh, the public rights -- social, cultural, economical, and religious -- must be recognized and the public must have given easy access to the government decision-making process. " 'An effective and accountable State-society partnership must begin from the bottom, as a process of empowerment, rather than be yet another exercise

in the politics of window dressing the *status quo* ... guaranteeing for those already in power an air of legitimacy' (O'Riordan, 1992) while doing little for the 'have-nots'" (Ahmed, 1994). An EIA model based on the NEPA should be developed in which both positivists and public policy-makers and the general public will have the equal rights of participation.

Critics argue that the public participation based on the NEPA can be lengthy and costly for developing country like India. A multistage process, as adopted by Western Australia may be useful and assure public participation at all levels of planning and decision-making. In this process, two EISs at two different stages are required. First, the public is invited to comment on a stage one EIS, and then on stage two EIS, if the project is to proceed. The first EIS covers issues such as the best available site evaluation for a proposed project. The second EIS covers environmental management issues, such as the environmental impacts and the mitigation measures to reduce the significance of those impacts. According to Bailey (1987), "the potential advantages of a staged approach to EIA are that: the public's views on the general features of a proposal can be obtained at an early stage before a preferred option has become entrenched; the public and conservation organizations will therefore be encouraged to participate in the EIA process, and their view and knowledge will therefore be available to the decision makers; and, those interested in the details of a proposal can have a further opportunity to comment when such details are made known in the second stage EIS."

There are also some potential disadvantages in requiring a proponent to produce two documents and to go through two public review periods; increased expense and delay are

obvious examples. However, an alternative can be used. Instead of preparing a first stage EIS, a series of workshops can be planned to educate the general public about the proposed project and then a series of public hearings can be held to hear the public views at the local level in India. Those public views, along with other social, political, cultural, and economic factors, should be given appropriate considerations in the second stage EIS.

"Whilst many countries have supported the concept of EIA following its emergence through NEPA, they have been anxious to avoid the subsequent experience in the United States of substantial judicial involvement in the process" (Fowler, 1985). Along the same lines, India avoided the judicial involvement, and preference has been given to performing both procedural and administrative requirements on a volunteer basis through the efforts of governmental officials. However, these volunteer efforts are not possible due to the heavy corruption and red tape in public services offices in India. The only way to achieve effective implementation is grant the public, including NGOs, rights of "standing" to sue the central government and its agencies in cases of alleged violation of the EIA requirements.

Another problem is public access to government information in cases of litigation. Most of the time, the average citizen is not even allowed to enter the Ministry of Environment and Forests building where all the required information is kept in the government files. And if someone is lucky enough to meet the responsible official, "often factual information necessary to assess the viability of legal action or properly to frame the action is withheld by [the officials] as confidential" (Lucas, 1976). For me, confidentiality appears reasonable if the information, for example, poses a threat to the national security,

but, it is difficult to understand that why public officials are reluctant to disclose the information such as when an application was filed, or for example, provide technical reports prepared by the project proponent or consultants, or other cleared information. The major reason for this problem is that public officials have no authority to disclose any kind of information. As Lucas (1976) quotes Franson and Burns (1971):

> Countless factual documents are languishing in public offices because public servants have no authority to release them and fear that if they do, their careers will be harmed; and two, that this secrecy frustrates and angers the very public servants caught in its trap, impairing their usefulness to all of us.

Therefore, the EIA process must be designed to provide the equal opportunities to all the involved parties, and "the main means of achieving equality are by providing for independent administration, explicit criteria for impartiality in appointments to review and decision-making bodies, mandatory release of documents including reasons for decisions, opportunities for appeals ..., separation of advocacy, regulatory and enforcement function, and regular independent auditing of overall performance" (Gibson, 1993).

RULE III

To ensure that environmental factors are incorporated and public participation is allowed at all stages of the planning, the environmental impact assessment must be performed as a legal requirement for projects causing significant effects on environmental quality.

Title I of NEPA requires all the federal agencies by law to analyze the environmental consequences of any project or activity so that broad and consistent consideration of environmental factors can be ensured in the planning and decision-making.

"In the 42nd amendment, provisions for the protection and improvement of the environment were incorporated in the Constitution of India with effect from 3rd January, 1977. In the Directive Principles of State Policy in Chapter IV of the Constitution, Article 48-A was inserted which enjoins the State to make endeavor for protection and improvement of the environment and for safeguarding the forest and wildlife of the country" (CPCB, 1995). In another landmark piece of legislation in India the Environmental (Protection) Act, 1986, considered the central government fully responsible for protecting the quality of environment in its entirety. Before 1994, EIA was performed only for mega-projects, as required by the international donor agencies. A Notification was enacted on January 27, 1994, by the Ministry of Environment & Forests which makes EIA an statutory requirement for 29 activities as specified in the Notification (Table 9).

The legal base for environmental impact assessment is not as firm in India as in the U.S. The major EIA requirements are not clearly specified; for example, the definitions of "project" and "environment" are very restrictive, and the specification of decision criteria about the extent and severity of environmental effects is uncertain (See RULES IV and V). The question arises, does the strict legal mandate for environmental assessment ensure the effective implementation EIA requirements? The answer to the question is no because "even with a well-defined legal process, arbitrary judgments and inconsistent results are likely where decision-making is left to the unconstrained discretion of ministers or the officials" (Gibson, 1993), as is the case in India.

On the other hand, government officials or positivists have defended their positions by arguing that "responsibility for final decision-making in light of environmental assessment

requirements will encourage [them] to incorporate environmental factors more regularly in their thinking and actions" (Gibson, 1993). Discussion about the control mechanisms in the previous chapter shows that government officials do not provide ecologically sound and consistent environmental decisions unless the decision-making by responsible authorities or officers is subject to independent review by the public and by the courts. The legal mandate for independent review by the courts and the public has been avoided in India's EIA process.

RULE IV

The meaning of the word "environment" must be defined clearly and specifically in the Act.

Due to the complexity of nature itself, defining "environment" in a few words is hard. The definition of "environment" varies from one geographical area to another. In general, most of the EIA procedures include only the biophysical factors.

In India, the Environmental (Protection) Act, 1986, has from the outset defined the "environment" to include only biophysical factors and their interrelationships. It includes, "water, air and land and the interrelationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property." The definition is very restrictive and explicitly excluded socioeconomic elements, cultural and religious values, and sociopolitical factors. Recently, the incorporated use of social and natural sciences principles and the growing public awareness have emphasized defining environment broadly and realistically. These require considering not only the

biophysical factors, but also social, political, cultural, economic, and religious factors, and their interrelationships. According to Gibson (1993), "This is not just because socio-economic and biophysical factors are inevitably linked, but also because their joint, interactive effects are what will threaten or serve prospects for sustainability." Therefore, steps should be taken in the early stages of the EIA development in India to broaden the content and implementation of the "environment."

RULE V

For the effective implementation of any EIA process, its assessment requirements must apply to all the federally proposed or sponsored "projects," both public and private, having the potential of causing significant effects, both positive and negative, on the quality of the environment.

In India, the Environment Impact Assessment Notification, 1994, provides a list of 29 activities (Schedule I) (Table 9) that are likely to cause significant adverse environmental effects. The EIA Notification also provides a list of the activities which are excluded from EIA requirements. The Act requires the project proponent to obtain an "environmental clearance certificate" if a project is "environmentally critical," and "site clearance certificate" if a project is in a "environmental critical (or sensitive) area."

The National Environmental Policy Act, passed by the U.S. Congress is one of the world's most far reaching pieces of environmental protection legislation. It requires that the federal government use "all practical means" to ensure the protection of the environment from human induced development activities. An activity could be anything: a project, action, plan, policy or legislation, undertaking or development, or operation.

One of the main features of NEPA is that it requires preparing an EIS in cases of proposed policies or legislation.

Unlike NEPA, the EIA process in India has no provision for assessment requirements of the policy. According to Gibson (1993), "this is in part due to the continuing reluctance of government authorities to open policy-making to public scrutiny. But there are also practical difficulties. Not all policies are intended for effective implementation or are clear and substantial enough to cause effects that can be identified and assessed, and government and responsible authorities are generally under no obligation to produce clear, substantial, and implementable policies."

In order to make EIA a practical success in India rather than just a piece of paper, the law must be applicable to all the activities causing significant environment effects, regardless of the size and the amount of money involved. Also, the environment effects of the proposed policy or legislation must be given the equal considerations in decision-making "for the same reasons that needed in program and project planning" (Gibson, 1993).

TABLE 9

List of Projects Requiring Environmental Clearance From The MOE&Fs

1. Nuclear Power and related projects such as heavy water plants, nuclear fuel complexes, rare earth.
2. River valley projects including hydel power, major irrigation and their combination including flood control.
3. Ports, harbors, airports (except minor ports and harbors).
4. Petroleum refineries including crude and product pipelines.
5. Chemical fertilizers (Nitrogenous and Phosphoric other than single superphosphate).
6. Pesticides (technical).
7. Petro-chemical complexes (Both Olefinic and Aromatic) and petro-chemical intermediates such as DMT, Caprolactam, LAB etc. and production of basic plastics such as LDPE, HDPE PP, PVC.
8. Bulk drugs and pharmaceuticals.
9. Exploration for oil and gas and their production, transportation, and storage.
10. Synthetic rubber.
11. Asbestos and asbestos products.
12. Hydrocyanic acid and its derivatives.
13. (a) Primary metallurgical industries (such as production of iron and steel, aluminum, copper, zinc, lead and ferro alloys).
    (b) Electric arc furnaces (mini steel plants).
14. Choler-alkali industry.
15. Integrated paint complex including manufacture of resins and basic raw materials required in the manufacture of paints.
16. Viscose staple fiber and filament yarn.
17. Storage batteries integrated with manufacture of oxides of lead and lead antimony alloy.
18. All tourism resorts between 200 meters to 500 meters of High Tide Line or at locations with an elevation of more than 1000 meters with investment of more than Rs. 5 crores.
19. Thermal power plants.
20. Mining projects (major minerals) with leases more than 5 hectares.
21. Highway projects
22. Tarred roads in Himalayas and/or forest areas.
23. Distilleries.
24. Raw skins and hides.
25. Pulp, paper and newsprint.
26. Dyes.
27. Cement.
28. Foundries (individual).
29. Electroplating.

Source: Pollution Control Acts, Rules and Notifications Issued Thereunder, CPCB, 1995.

RULE VI

The Environment Impact Assessment process must be aimed at identifying the best possible alternative rather than just accepting the proposal.

Some critics dispute the above statement. As Wood and Bailey (1994) stated: " ... although the consideration of the environment impacts of alternative actions is usually included in the EIA process[es], there is often little evidence that this consideration is meaningful." The requirement to evaluate alternatives is not mentioned in the Western Australia EIA process; however, it is usually specified in the proposal-specific guidelines issued by the EPA (W.A.). Thus, in the majority of the environmental documents prepared in W.A., the discussion about the possible alternatives either is totally ignored or is very restrictive and is the major flaw of W.A. EIA process.

On the other hand, some EIA experts believe that considerations of environmental effects of the feasible alternatives can enforce effective integration of environmental considerations along with social, political, cultural, religious, technical, and financial considerations. Gibson (1993) emphasized that, "imposition of standard requirements to examine purposes, needs, and alternatives is the main means by which the environment assessment process can force effective integration of environmental considerations into the crucial earliest stages of the planning of new undertakings.... To do this, the process must require proponents to define and defend the objectives of their undertakings, to demonstrate that they have examined alternative ways of satisfying these objectives in light of environmental as well as financial and technician, [social, cultural, and religious]

onsiderations, and to show that their proposals represent the best available means of serving sustainability and the public interest."

A landmark achievement of the NEPA is that it requires project proponents to identify and analyze all the feasible alternatives, to explain why the final decision is considered the best possible solution, and to summarize their findings in the final EIS. Consideration of alternatives is specified in Sec. (c)(iii) of Title I, and also, in 40 CFR 1502 of guidelines, issued by the CEQ.

In India, there is no mention of "alternatives" or what should be covered in the Environment Impact Report or Environment Management Plan. However, the guidelines are available from the Ministry of Environment which vary from project to project and from time to time. A provision must be added to the existing EIA Notification in India which forces project authorities to consider all the feasible alternatives, including "no-growth" or "no-project," so that environmental factors should be given appropriate consideration in the early stages of the planning.

RULE VII

While adoption of a broad definition of "project" or "environment" does not ensure the protection of environmental quality and sustainable development, environmental impact assessment procedures have been "bedeviled by the absence of an accepted set of basic criteria for [impact] evaluation" (Beanlands and Duinker, 1983). Even with the integrated use of social and natural sciences principles, it is unlikely and undesirable to prepare universally accepted impact evaluation criteria. "But it is certainly possible ... at a national

[or a local] level, to take some steps toward specifying the objectives of decision-making" (Gibson, 1993) " ..., which should reflect the best values of the society whose resources will be affected by the decisions to be made" (Cheney and Schleicher, 1982).

The purpose of an EIS is to provide the decision maker with enough information about "the significance of each impact on each resource for each alternative" (Cheney and Schleicher, 1982) which can help him/her to make the best possible decision. Therefore, the measurement of "significance" is very critical and necessary for effective decision-making. The key issue is to determine what the "significance criteria" are because, if the criteria in use determine that the impacts are significant, when in actuality they are not, this analysis will result in the preparation of a very costly and time consuming EIS, which really would not be required. Or, if the significance criteria cause the impacts to be perceived as not significant when actually they are, an EIS will not be prepared, when actually it is required, which will result in a environmental degradation. Therefore, the question arises, how one can measure the significance of environmental impacts using criteria that will be acceptable to all the concerned parties.

In their paper, "Impact Significance Determination -- Basic Considerations and a Sequenced Approach" presented at International Impact Assessment Conference held in Washington D.C., authors Canter and Canty (1993) identified different impact evaluation approaches used around the world and presented a sequenced approach, based on their findings. According to them, "... significance determination could be categorized into two approaches based on the criteria used. For example, all decisions seemed to be founded upon either 'predetermined' or 'judgmental' criteria."

A "predetermined" approach is similar to the "positivist orientation" where the significance of impacts is determined against the predetermined or pre-established thresholds of the regulatory agencies, prepared by scientists or positivists. This, in turn, "reduces the speculation involved in decision making ... [and allows] for a systematic determination" (Canter and Canty, 1993). However, there is a major drawback with this approach. Positivists believe that they can put a dollar value on every component of the natural environment, but natural wealth such as aesthetic and recreational values cannot be measured in monetary terms. Therefore, the thresholds derived by using predetermined criteria can undermine the significant environment impacts as non-significant.

The second approach, "judgmental criteria" is similar to the "public policy-making" approach. The public policy-makers believe that not everything can be quantified, which requires value judgment. As Cheney and Schleicher (1982) stated, judgments of significance "are value judgments.... Clearly, the choice of an appropriate system of values is critical ... [and] the chosen value system should reflect the best values of the society whose resources will be affected by the decision to be made. Here, the society means -- the nation as a whole." Finally, rather than describing the impacts as "significant" or "non-significant" as in case of predetermined criteria, the characteristics of impacts resulting from judgmental criteria can be described in terms of type, scale, complexity, intensity, and duration (Canter and Canty, 1993).

In NEPA, the Council On Environment Quality (CEQ) issued regulations in 1979, and used "context" and "intensity" in defining significance. Context means place and time, and intensity means how "bad" or severe the impact is. However, in determining intensity,

both predetermined and value judgment factors are considered. Predetermined criteria are used for elements like air and water where the standards are established by using sophisticated technology.

In India, the EIA process does not talk about determining whether significant impact exists. However, guidelines are available from the MOE&Fs which vary from project to project. For effective decision-making, "significance criteria" must be legally enacted and the combination of both predetermined and value judgment approaches can be used, which will facilitate the equal participation of positivists, public policy-makers, and the general public. Based on their judgment, Canter and Canty (1993) proposed a framework, a sequenced approach, for significance evaluation. Their ten points criteria, as used in the NEPA (Table 10), can be used in India's EIA model.

TABLE 10

Context and Intensity Considerations in Defining "Significance" as Used in the NEPA Process in the USA (CEQ)

(a) Context: This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the local area rather than in the world as a whole. Both short and long-term effects are relevant.

(b) Intensity: This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity.

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect will be beneficial.
2. The degree to which the proposed action affects public health or safety.
3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.
5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973 (US).
10. Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

Source: Environment Impact Assessment Review 1991; 11: 297-309.

RULE VIII

To successfully comply with EIA requirements, terms and conditions of approval must be monitored by an established program.

In India, the Environment Impact Assessment Notification "... enable[s] the Impact Assessment Agency (IAA) to monitor effectively the implementation of the recommendations and conditions subject to which the environment clearance has been given, the project authorities concerned shall submit a half-yearly report to the Impact Assessment Agency." However, this is not enough. The project proponent is solely responsible for preparing the half-yearly report and the IAA has to totally rely on that. In the absence of control mechanisms, the project proponent does not feel obliged to follow the conditions and terms of approval. Like avoiding EIS preparation, a project authority may also try to avoid following the monitoring requirements because they require additional work to be performed.

In recent years, government authorities and EIA experts around the world have realized the potential value of monitoring to ensure the successful compliance of assessment requirements. They realized that "without effective monitoring, there is little basis for judging the accuracy if impact predictions or for improving predictive science.... Similarly, monitoring and enforcement of compliance are needed to encourage proponents to be diligent in their adherence to commitments and conditions of approval" (Gibson, 1993). Compliance monitoring ensures that environmental factors are incorporated to the final decision. It also determines what kind of mitigation measures are effective and what should be included in future assessments.

The EIA procedure in India is at the very early stages of its development. In the last two years since the enactment of EIA in 1994, not enough information has become available to judge the accuracy of effects prediction and the extent to which environment quality has been protected. However, lessons from developed countries or developed EIAs can be incorporated into India's procedures and a monitoring program must be enacted and implemented in the law.

TABLE 11

Summary of Rules Proposed to Improve India's EIA Process

1. An effective EIA model must encourage an integrated use of social and natural sciences principles, techniques, or methods to analyze a broad range of complex environmental problems.

2. Democratic and fair participation of all the concerned parties must be allowed in environmental planning and decision-making.

3. To be ensured that environmental factors are incorporated and the public participation is allowed at all stages of the planning, the EIA must be performed as a legal requirement for projects causing significant effects on the environmental quality.

4. The meaning of the word 'environment' must be defined clearly and specifically in the law.

5. For the effective implementation of an EIA process, its assessment requirements must apply to all the federally proposed or sponsored "projects" (both public and private) having the potential of causing significant effects on the quality of the environment.

6. The Environment Impact Assessment (EIA) process must be aimed at identifying the possible alternative rather than just accepting the proposal.

7. An accepted set of basic criteria for impact evaluation must be enacted in the Act.

8. To successfully comply with EIA requirements, terms and conditions of approval must be monitored by an established program.

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Appendix A

Brief Description of EIA Procedures In The United States, Western Australia, And The Philippines

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The National Environmental Policy Act (NEPA)

Throughout the history of the U.S., an important objective of policy making was to promote economic growth. Since mid-1960s, analysts of public attitudes and opinions have reported a consistent shift in popular preferences toward greater emphasis on environmental protection and quality of life (Caldwell, 1989). More and more people have shown their willingness to pay higher taxes to ensure environmental quality. Even though sustainable development and public stewardship has become more popular, the goal of land management, both public and private, is still economic gain. In July 1968, at the joint House-Senate colloquium to discuss a national policy for the environment, Lawrence Rockefeller observed:

> The area where greater knowledge would help is the resource decision-making process. Many federal resource decisions are still ma[d]e on a benefit-cost ration which does not adequately reflect environmental factors. We know -- or are told -- precisely what the dollar benefits are for flood control, irrigation, or highway traffic -- but no one can tell us the cost of various alternatives in long-term environmental values (Dreyfus and Ingram, 1976).

In December 1969, a national policy for the environment -- the National Environmental Policy Act (NEPA) -- was passed by the United States Congress. NEPA's primary function is to protect and enhance environmental quality and facilitate decision-making. However, NEPA does not forbid federal agencies from permitting projects which

would harm the environment. Rather, NEPA's role is informational. It facilitates planning and decision-making by requiring complete analysis of technical, environmental, political, economical, and social aspects of any proposed federal undertaking.

The six page NEPA Act is both substantive and procedural in nature. It holds the Federal government responsible "in cooperation with State and local government, and other concerned public and private organizations" to restore and protect the quality of the environment, on the US and/or on the foreign (leased or occupied) lands. It requires the Federal agencies to reveal all the possible information about the likely environmental consequences of any "project"-- to grant research funds, to construct public work projects, to lease public land, to issue permits or licenses, or any legislation changes, by using social and natural sciences principles as the basis for their analysis, and to summarize their findings in an final EIS. The impact statement should be distributed as a "full disclosure document" for public review.

EIA Process In The Philippines

Over the past two decades, the international community has become seriously concerned about the deteriorating environmental quality of our planet. These environmental concerns led to the development and implementation of EIA processes both in developed and developing countries. Seven years later, after the enactment of NEPA, the Philippines developed and implemented its version of the EIA process, commonly known as "the EIS system."

The Philippine National Environmental Policy was introduced as a Presidential Decree and became law in 1977. The goals of the Philippine's "EIS system" are patterned after the NEPA process. As stated in the Presidential Decree: "... all agencies and instrumentality's of the national government, including government-owned or controlled corporations, firms and entities shall prepare, file and include in every action, project or undertaking that significantly affects the environment, a statement" (Abracosa; Jenkins; Ortolano, 1987).

Despite the authoritarian rule of President Ferdinand Marcos, the Philippine EIA process was formulated as a decentralized regulatory process. Power rested in lead agencies which review and circulate the DEIS (Draft Environmental Impact Statement) for public scrutiny. For any particular project, the selection of a lead agency was based on the type of activity involved (Abracosa and Ortolano, 1987). A list of "environmentally critically projects" has been developed, and any project on the list requires an "environmental compliance certificate" from the lead agency before the activity is implemented. Environmentally critical projects include heavy industries (e.g., iron and steel mills, petroleum, and petrochemical industries), resource extractive industries (e.g., mining, forestry, and fisheries projects), and infrastructure projects (e.g., dams, power plants, and roads) (Ross, 1994). In addition, any project or non-critical project in "environmentally critical areas" is also required to have an environmental compliance certificate for project approval. Environmentally critical areas include national parks, habitats for threatened or endangered species, areas with critical slopes, area subject to

floods, volcanic activity, or typhoons, prime agricultural lands, aquifer recharge areas, special use water bodies, coral reefs, and mangrove areas (Ross, 1994).

In 1978, the Philippine's EIS system was transferred to the Ministry of Human Settlements, directed by the President's wife, Imelda Marcos. The new ministry annexed the NEPC (National Environmental Policy Commission) and moved preemptively to change the implementation of the EIS system by converting it from the original decentralized scheme to a centralized regulatory process and required all types of projects to secure environmental compliance certificate directly from NEPC (Abracosa and Ortolano, 1987).

After the fall of President Marco's authoritarian regime, the EIS system was placed under Department of Environment and National Resources. The EIS system is implemented by the Environmental Management and National Resources (Ross, 1994).

The Western Australian EIA System

In 1971, the state of Western Australia introduced a new legislation, the Environmental Protection Act, enabling the use of "environmental reviews" to assess the environmental impacts of the proposed proposal. The meaning of the word "environment" described in the Act is:

> both lengthy on the one hand and restrictive in its exclusion of most of the social environment on the other hand.... means the physical factors prevailing in the State, including the land and coastal waters, seabed and subsoil adjacent thereto, water, atmosphere, sound, odorous, tastes and radiation, the social factor of aesthetics and all factors affecting animal and plant life (Bailey and English, 1991).

The Environmental Protection Act (1971) established a three member Environmental Protection Authority (EPA), assisted by a Department of Conservation and Environment (DCE). Like CEQ in the U.S., the major responsibility of EPA (W.A.) is to guide the government on the environmental issues, based on the findings of the DCE. The Act of 1971 did not explicitly require the EIA as a statutory requirement. It required volunteer efforts from the public agencies to develop and implement their own guidelines to protect the environment. In 1986, a new Environmental Protection Act was enacted. It requires the public agencies to perform the environmental impact assessment as a statutory requirement if the proposed proposal has the potential of causing significant environmental consequences. For the purposes of the Act, a proposal means:

> project, plan, program, policy, operation, undertaking or development or change in land use, or amendment of any of the foregoing.

The development of the 1986 Act was based on the experience of EIA processes in the Western Australia and the results of EIA implementation in other developed and developing countries. An important feature of 1986 Act was to broaden the scope and implication of EIA:

> An Act to provide for an Environmental Protection Authority for the prevention, control and abatement of environmental pollution, and the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the foregoing (Bailey and English, 1991).

The Environmental Protection Act (1986) requires the assessment of both public and private proposals, which, if implemented, have the potential of causing significant environmental impacts. Under the Act, the proposal could be referred to EPA for assessment in one of the five ways:

- by the EPA;
- by the decision making body, other than EPA;
- by the Ministry for Environment;
- by the project proponent;
- by the public.

After the initial evaluation of the proponent's proposal, the EPA decides to formally assess the proposal under Pt. IV of the Act, if the environmental effects are of major significance. The following three approaches are commonly used for formal assessment:

1. Notice of Intent (NOI);
2. Public Environmental Report (PER); and,
3. Environmental Review and Management Program (ERMP).

A Notice of Intent is used to assess proposals where the potential environmental impacts are not large in magnitude or extent, and generally does not allow for public review. However, in some instances there is consultation with the local community and other relevant interest groups. This is termed managed NOI. Thus the NOI is used both as a referral and as an assessment document (Bailey and Brash, 1989).

In cases, "where an intermediate level of assessment is required ... and more general public interest is involved, the EIA documentation and level of assessment are called a public environmental review (PER). This is essentially the public environmental report renamed" (Bailey and English, 1991). The public review period for PER is eight weeks.

Finally, in cases of major industrial and resources mining projects, where the potential impacts are of special concerns, the high level assessment, called the environmental review and management program (ERMP) is required. In this case, the public review period is ten weeks.

Once the EPA has decided on the level of an environmental assessment, the project proponent is required to prepare and submit relevant documents to the EPA. The EPA is required to review the document to analyze its technical adequacy "and prepares a report on the environmental factors relevant to that proposal; and the conditions and procedures to which implementation of that proposal should be subject" (Bailey and Brash, 1989). The report is then submitted to the Ministry for the Environment to publish and circulate it so that the public and other decision-making authorities can review its contents. Once an agreement is arrived at by the relevant Ministries and other public agencies, the proposal is cleared for implementation.

Appendix B

List of research articles about the EIA procedures in the U.S., the Philippines, and Western Australia published in international research journals and books:

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