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# Environmental Impact Assessment for Developing Countries: Summary and Recommendations

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An International Conference on Environmental Impact Analysis for Developing Countries was held in Hyatt Regency Hotel, New Delhi, India, during 28th November to 2nd December 1988. The Conference was organized by the Pollution Control Research Institute, Hardwar, India, with the support and co-operation of the Government of India through Bharat Heavy Electricals Ltd (BHEL), United Nations Development Programme, United Nations Environment Programme, United Nations Industrial Development Organization, International Association for Clean Technology, International Society for Ecological Modelling and International Water Resources Association.

While welcoming the distinguished guests and experts, Mr P. S. Gupta, Chairman and Managing Director, BHEL highlighted that over the years, mankind has rather ruthlessly neglected the environmental protection aspects in the name of industrial development, which has resulted in large-scale pollution of air, water and soil and has contributed to major deforestation. All this is seriously telling upon the living conditions on our planet and threatens to raise the earth's temperature through the green-house effect.

In his address Mr Gamil M. Hamdy, Resident Representative, UNDP, New Delhi, brought out that through fuller knowledge and wiser action we can achieve for ourselves and posterity a better life in an environment more in keeping with the human needs and hopes.

In the keynote address, H E Mr Z. R. Ansari, Minister of Environment and Forests, pointed out that the procedures have been laid down to ensure environmental considerations are taken into account while selecting technology and sites. While assessing the impact for a certain industry, all the necessary parameters including social costs are also to be taken into consideration.

Inaugurating the Conference, H E Mr J. Vengala Rao, Minister of Industry, emphasized that environmental protection is as important in developing countries as in developed countries. However, developing countries like India, on their way to industrialization, could usefully adopt the experience of developed countries. India has been giving utmost importance to economic and industrial growth that is consistent with environmental preservation.

As the Minister of Industry, H E Mr Vengala Rao, had to endeavour always to strike a balance between industrial growth and environmental protection. Industry has environmental impacts in terms of consumption of raw materials and discharge of waste products. There is often conflict between environmentalists and people interested in growth and industrial expansion. He pointed out that the advocates of industry argue that industrial growth will be hampered if environmental regulations are applied too rigidly but the environmentalists maintain that unless there is a certain rigidity in the enforcement of anti-pollution regulations, the long-term environmental impact due to unregulated industry is injurious to society at large. In India, legal requirements for environmental clearance of projects have been made quite strict. While these environmental measures will require additional capital costs as well as extra time for project clearance, the Government considers these costs worthwhile for the long-term interest of the country as a whole.

The Minister further said that developing countries must strike a reasonable balance between industrial growth and environmental preservation. The underlying concept has to be that human beings must approach nature with reverence. The bounty of nature in all its aspects should be used with caution and restraint. Development must avoid over-exploitation and abuse of nature and resources. Ultimately human happiness will depend upon our ability to live in harmony and peace with nature.

In addition to the opening and valedictory sessions, the Conference was organized into 13 major technical sessions: EIA Methodology, EIA for Developing Countries, Water Pollution Impacts, Environmental Impact of Water Systems, Noise Impacts and Case Studies, Waste Management and Land Use Impacts, Air Pollution Impacts, EIA Case Studies, Biological Impacts, Environmental Impact of Industry, Environmental Impact of Thermal Power Plants, EIA Case Studies from Industry, and Education and Training for EIA.

A total of 109 papers were presented during the 13 sessions over a period of 4½ days. These papers were selected by an international panel of experts from 362 abstracts initially received by the Pollution Control Research Institute. As to be expected for a Conference with such a comprehensive scope, discussions were wide ranging and covered practically all aspects of environmental impact assessment.

Since it will not be useful to review all the issues that were raised during the Conference, the present summary covers primarily the main issues raised by the participants.

### *1 Issues complementary between environment and development*

There was complete unanimity among the participants about the need for a proper balance between environmental conservation and the overall development. N. C. Thanh (Thailand) and D. C. Tam (Canada) summed up this view that environment must not be

ignored and development must not be impeded. Most of the debates so far on environment and development issues have often involved considerable amount of emotion from all sides but not enough reasoning and facts. Ideally, every environment-development issue should be analysed objectively and dispassionately so that decisions can be made which will enable development to proceed without destroying the resource base and the environment on which the very process of development depends. For this to occur, it would be necessary to create rational and sensible environmental awareness in all people concerned: planners, environmentalists, engineers, economists and other related professionals, politicians and the general public.

### *2 EIA must be made mandatory*

It was agreed that all developing countries must strive for a legal framework which would make EIA mandatory for new projects or expansion of existing projects. While the legal basis for carrying out EIA is an essential prerequisite, it was cautioned that it is one of the several other considerations which need to be satisfied concurrently in order that the environment can be protected.

The countries that make EIA mandatory must have the appropriate institutional framework within which such assessments can be objectively carried out. Equally, it is important to ensure that adequate manpower with appropriate expertise is available within the country to carry out the impact assessments and to review them objectively. An example was given of a country, where EIA has been made mandatory for several years, but out of several thousand projects subjected to EIA, not even one was ever denied clearance.

### *3 Current EIA methodologies and processes are flawed*

Current EIA methodologies and processes are seriously flawed, and not surprisingly their application to developing countries leave much to be desired. EIA, as it is practised at present, is an art and not a science. Furthermore, EIA process has been defined in different ways in different developing countries. No two developing countries appear to have defined it in the same way. As the Executive Director of the United Nations Environment Programme, Dr Mostafa K. Tolba, in his message to the Conference, pointed out the linkages of EIA to the 'planning of social and economic developments are still not clear. What is needed most are cost-effective and efficient means of implementing EIA as part of the approaches to achieving sustainable development.'

All development projects have both negative and positive impacts but EIA, as it is currently practised, only concentrates on negative environmental impacts. It is unfortunate that the positive impacts are now completely ignored, as Prof. Asit K. Biswas, President of the International Society for Ecological Modelling, pointed out

during the valedictory session of the Conference. EIA addresses itself to both positive and negative impacts. The overall thrust of EIA must be shifted to maximizing the positive environmental impacts and minimizing the adverse impacts rather than focusing exclusively on negative impacts. Only by taking such a holistic approach, environmental conservation can be practised and enhanced.

Despite numerous EIA handbooks, manuals and guidelines prepared by national organizations and academic institutions, participants felt that the EIA reports are still too academic, bureaucratic, mechanistic and voluminous. Often, they do not concentrate on major environmental issues but provide lengthy deliberations on fringe issues that could be counterproductive and consume resources that are more urgently needed for analysis of other important problems.

#### *4 EIA reports are mostly too mechanistic*

An objective analysis of EIAs carried out in developing countries indicate that they are often too mechanistic. For example, waste discharges and effluent emissions are generally described in terms of concentration levels in the atmosphere and surface waters. The entire emphasis is on whether the concentration levels are permissible or not. What these discharges and emissions actually mean in terms of human and animal health and the biota are mostly ignored. If indeed there is any discussion, it tends to be somewhat general or superficial.

Analysts often appear to have no clear idea as to what type of information is needed by the decision-makers. Accordingly, they may count the number of trees in one area, but may not consider what could be the long-term impacts on the forest due to the increased levels of pollution. It is assumed that as long as concentration levels are within permissible limits, no other problem exists.

Equally, many EIA reports now contain numerous tables of collected data, without any clear idea about their relevance and even necessity. In many developing countries there is now far too much emphasis on data collection but not enough on their analysis, interpretation and their environmental implications.

#### *5 Lack of follow-up monitoring*

EIA, as it is practised now, ends immediately after the environmental clearance of a project has been received. Compliance monitoring is seldom carried out, either by the project authorities or by the responsible government agencies. This practice is contributing to several problems, among which are the following:

- a) Pseudo-analysis: In the absence of any follow-up monitoring, many pseudo-analyses of EIA, are now being carried out with the main objective of only getting

the projects cleared quickly, for implementation irrespective of the environmental costs. The whole purpose of such pseudo-analysis is to justify projects based on 'manufactured' data and/ or deliberately skewed analysis. Such pseudo-analysis, whenever carried out, circumvents the whole purpose of EIA.

- b) Prediction difficulties: In most EIAs of major development projects, it is impossible to predict with complete reliability all potential environmental impacts, their magnitudes and times of occurrence. Uncertainty is unavoidable in most environmental prediction. Thus, follow-up monitoring must be an essential requirement, if environmental impacts are to be properly managed.
- c) Effectiveness of EIA without follow-up monitoring, it is not possible to judge the overall effectiveness of any EIA. Proper monitoring and evaluation are essential to ensure that the recommendations made by the study will actually be implemented. Reliable data on post-project observed impacts and their comparison with the predicted ones can give a clear indication of the accuracy of the earlier EIA predictions. Such results could be successfully used to develop more cost-effective methodology in the future.

#### *6 Data availability and reliability*

One of the most important constraints for carrying out reliable EIAs in developing countries, within a reasonable timeframe, was identified by the participants to be poor data availability and reliability. It was pointed out that very often much more environmental data exist in a developing country than people generally believe. However, poor or non-existent data retrieval and management system, inter-Ministerial and/or inter-institutional, rivalry, unnecessary classification of data as secret or confidential, and official apathy, often ensure that data are not easily available. Often people who need the information may not even know who is collecting various environmental data, where they are stored and how these can be obtained.

An equally serious problem is the reliability of available data. While much of the data collected are of reasonable quality, equally there are several instances of unreliable data which were collected at wrong places, or with improperly calibrated equipment, incorrectly analysed, or simply 'manufactured'. It is a very difficult, expensive and time-consuming process to separate unreliable data from good data within any given data set.

There is an urgent need to develop proper environmental data management systems, which are easily available to the analysts within reasonable time and cost. Since the availability of computers is not a major problem in most developing countries, it should be possible to develop appropriate environmental data management systems.

### *7 Cost-effectiveness of EIA*

Opponents of EIA have sometimes claimed that the benefits from such assessments are outweighed by the delays in project implementation, which generally tend to increase their cost. While on the basis of the present practice there is partial validity to this claim, many speakers pointed out that the main reason for such delays was that EIA was either not properly conceived or not integrated in the project cycle from the beginning. Often, only after project planning has been completed, people think about EIA. This is why delays sometimes could occur in project implementation. Properly conceived EIAs must be integrated in the project planning right from the initial stage. This would not only improve the overall quality of the project but would also reduce substantially or even eliminate, any delay mainly due to EIA. EIA costs are found to be relatively small, when compared with the total project costs.

An important observation was that even when the quality of EIA predictions were somewhat poor, and they caused cost and time overruns, they did, however, contribute to measurable environmental benefits.

It was argued by Professor Biswas that in developing countries often 'best' is the enemy of 'good'. What one should be aiming for is a good EIA study that could identify, say some 80 per cent of the potential environmental impacts within a reasonable time frame and acceptable cost. If proper follow-up monitoring is ensured, whatever may be the lacunaè in the analysis, these can be identified in time and appropriate remedial actions can be taken.

### *8 Presentation of EIA results*

Many of the participants raised the issue of poor presentation of EIA results. For complex EIAs, the results often are presented in several bulky volumes. Very few people, if any, actually have time to study such reports in depth, let alone understand them. There is an urgent need to present the results of such analyses succinctly and clearly. To the extent it is possible, attempts should be made to present results in graphic forms which could be easily understandable by non-experts. As computers become widely available in developing countries, their costs continue to decline and the technology of computer-graphics improves substantially, computers should play a more and more important role not only for carrying out analysis but also for displaying EIA results graphically.

### *9 Public Participation*

During the entire conference, considerable debate centred on what should be the role of public participation in the EIA process. The overall view of the participants was that

the public currently has very little say in the process in nearly all developing countries. It is difficult, often even impossible, to obtain or consult copies of the EIA Reports. The public has an equally limited, if any, role in most developing countries to question or comment on the quality of the reports or conduct of the environmental clearance process.

While an overwhelming number of participants favoured more public involvement, there were a few dissenting voices preaching caution due to such problems as illiteracy and ignorance that currently exist among many who could be involved in the process.

### *10 Education and Training*

Many argued that one of the most important factors that could significantly improve the EIA process is good education and training. Currently very few educational and training courses exist in developing countries that properly consider various EIA methodologies available in depth. Information on the legal and regulatory frameworks and institutional arrangements are also necessary. Education and training processes are important since the fundamental factors behind all EIA predictions are still the best professional judgement and/ or experience with similar projects earlier.

Both short-term and long-term courses are necessary. These courses, however, must be multidisciplinary, and the focus should be on the practical and operational aspects of EIA and not on theoretical implications.

In his closing address, H E Madhavsingh Solanki, the Indian Minister of Planning, said the view that the pursuit of environmental and development goals could be combined has now been accepted, and India has endeavoured to incorporate this philosophy in her development planning and also to devise mechanism to operationalize it in practice. India's Seventh Five Year Plan (1985-90) states that 'if the gains in productivity are to be sustained, resources must also continue to be available over time. This requires that, while providing for current needs the resources be so managed as to enable sustainable development.'

The Minister pointed out that a country like India faces many problems due to the enormity of her development needs and the paucity of resources. But in the area of the environment, India has three distinct advantages. First, the country as a comparatively 'late-corner' in the area of the environment, can learn from the experiences of other countries that are ahead of her. Second, India effectively uses the planning mechanism for steering and guiding socio-economic development which provides a balance between the public and the private sectors as well as short-term and long-term interests of the country. Thus, a conscious effort can be made to incorporate long-term environmental considerations in the development programmes in a systematic manner. Third, most of the large projects in the area of industry, power and infrastructure are in the public sector, where again it is easier to take care of the

environmental considerations in accordance with the public policy and long-term social interest. The fact that the Pollution Control Research Institute of Bharat Heavy Electricals Ltd, a major public sector undertaking, organized a major international EIA Conference is a manifestation of that public concern.

### **Recommendations**

On the basis of papers presented and the ensuing discussions, there was general agreement among the participants on the following recommendations:

1. EIA should be made mandatory in a phased manner. The phasing can be done based on priorities and expansion of infrastructure. Laws and regulations, however, by themselves, are not enough. All efforts should be made to ensure that the legal requirements are actually implemented. UNEP and UNDP should assist those countries that require assistance, to develop appropriate legal frameworks and their implementation.
2. EIA methodologies should incorporate requirement for climatic, social and cultural characteristics. Methodologies that are currently available for EIA are generally not appropriate for developing countries. It is necessary to ensure that the methodologies developed would enable developing countries to carry out EIA within limited cost and expertise available and that it can be completed within a reasonable timeframe. Equally, EIA must consider both positive and negative environmental impacts. National and international organizations should work together to develop operational EIA methodologies.
3. An objective and reliable review of the current status of the effectiveness of using EIA in developing countries, methodologies used, and their relative merits, and constraints, main features of their implementation processes and the emerging trends be carried out. As a first step, it is recommended that UNEP, and the Asian Development Bank (ADB) prepare such a review for the Asian region.
4. For establishing clear and unambiguous guidelines for EIA that are acceptable to relevant Ministries, United Nations Agencies, Asian and other Development Banks and bilateral aid organizations, it is recommended that National Workshops be organized, which would include all the relevant parties.
5. It is recommended that UNEP and International Society for Ecological Modelling collaborate together to prepare a handbook on good EIA case studies from developing countries in the field of air, water and solid wastes. Such a book would be useful to analysts in developing countries.
6. Monitoring and follow-up work is required to see how the forecasts made by the initial EIA studies compare with the actual impacts after the implementation of

the projects. It is recommended that national and international organizations collaborate on a series of specific case studies where EIA forecasts made during the project approval phase are compared with the observed impacts after implementation. Results of such intercomparison studies should be made widely available.

7. Risk analysis and social impact analysis should be integrated within the framework of EIA methodologies. UNEP and ADB in collaboration with IACT and ISEM, should sponsor research to develop operational methodologies for risk analysis and social impact analysis.
8. Public participation is an important requirement for EIA, UNEP, UNIDO and UNDP should sponsor studies to review the extent of public participation and their relative effectiveness in conducting EIA studies in various developing countries. Such comparative studies would assist countries to determine the best alternative available to them to ensure public involvement in EIA.
9. Education and training in EIA are essential for all developing countries. All international and national organizations should encourage education and training on EIA to develop adequate expertise in developing countries.