

A Plea for Proenvironment EIA

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Key concepts: Ok Tedi mine, Fly River, Three Gorges Dam, increased Yangtze floods, Hengduan mountain ranges, Mekong basin, decline of world fisheries, global ecosystem integrity, hidden environmental impacts, the “no development” option

The prevalent attitude that the purpose of EIA or environmental impact assessment is to promote economic growth is misguided and detrimental. Often EIA is essential for smooth economic growth, of course, but it has a more vital role to play in safeguarding the biosphere including continental, oceanic and atmospheric ecosystems and biodiversity. That EIA is failing is evident to anyone well-informed on current ecological and environmental issues. Why it is failing is less evident, partly because the people who produce EIA and those who pay for it like to keep their operations and reports secret. This secrecy typically is justified in terms of “business confidentiality.” *The real reason many EIA reports are kept confidential or secret (not available to the public, and not subject to peer review) is because they are so bad that they disgrace the companies producing them and paying for them, and bring disrepute to the projects they endorse, regardless of whether the projects are environmentally sound.* Mechanisms for quality control of EIA are inadequate. EIA is insufficiently subject to lawful regulation and enforcement. Monitoring, if carried out at all, is done by parties with vested interests in the EIA or in the project itself. So-called “mitigation” measures seldom work as proposed or intended because they are poorly conceived or not conscientiously carried out. The purpose of this article is to identify basic flaws in the currently prevailing “EIA industry,” and to suggest measures to reform it. Several particularly egregious projects with poorly done EIA are discussed.

The primary problem with the major agencies and companies presently dispensing EIA in Asia (including those with headquarters or offices in Bangkok) is that they are doing EIA on behalf of “big business” and the “establishment.” The “development establishment” has formed a vicious circle of the development companies promoting projects and paying for EIA, the banks financing projects, the governments, political parties, politicians and their business allies hoping to benefit from projects, and of course, the well-paid EIA consultants and their companies. Establishment organizations tend to be more interested in their own short-term profits than they are in the over-all success of the project, and not sufficiently concerned about long term damage to society and the environment. Establishment EIA reports almost always rationalize or minimize environmental impacts, and justify projects. When environmental impacts cannot be overlooked or denied, monitoring programs and mitigation measures may be proposed “to mitigate or minimize the damage.” These programs and measures may provide additional employment and revenues for the EIA company and/or other contractors, but otherwise they usually either 1) are totally useless or hopelessly inadequate; 2) themselves cause additional negative environmental impacts; or 3) are not conscientiously carried out as

proposed because they cost money or require effort that does not result in direct financial benefit.

At present, EIA is often seen as the “servant of development: promoting better developments, at best, but basically supporting economic growth. EIA endorses waste discharges, emission of greenhouse gases in many cases, and the profligate use, mining, extraction, and processing of natural resources. The whole process is subject to political pressures. Key players within government have no security of employment whatever. Officers of integrity have little chance when confronted by hostile interests at a political level” (Gilpin, A. 1995. *Environmental Impact Assessment (EIA): Cutting edge for the twenty-first century*. Cambridge Univ. Press, p. 3). As an EIA consultant for several hydropower projects in Southeast Asia, I was repeatedly advised by project proponents “you might as well go ahead and do the EIA, and get the money, because otherwise someone who isn’t so concerned about the environment will do it. And the project is going to go ahead anyway, because the government (and/or other powerful interests) wants it.”

So long as EIA operates this way, it will never fulfill its only morally and ethically valid and socially functional reason for existing: to protect the environment. Establishment EIA must be replaced by proenvironment EIA. Governments involved with projects, companies undertaking projects, and banks financing projects should operate on the principle that only proenvironment EIA is acceptable. In the long run, proenvironment EIA is globally and regionally as well as nationally responsible and beneficial, whereas establishment EIA is irresponsible and harmful. Banks, governmental agencies, NGOs and the media should promote this concept. EIA reports must be available for public scrutiny. They must also be subject to peer review. A “peer” is someone whose knowledge and competence approaches, equals, or exceeds that of the person who wrote the report. Peer review should be done by independent consultants or peer review bodies. Journals and websites that publish reviews or critiques of EIA reports are needed. Individual consultants and small companies wishing to conduct “proenvironment EIA” but unable to obtain contracts can hone their skills and establish their reputations by writing and publishing reviews of EIA reports on large and important projects.

The extent of fraud, high crimes and misdemeanor on the part of developers and their EIA consultants is of course unknown, but it certainly exists and is far from negligible. **Ok Tedi gold and copper mine**, developed by Australia’s largest company, Broken Hill Proprietary (BHP), is one of the largest and most productive mines in the world. It is located in the highlands of the Fly River in Papua New Guinea. The Fly River is the largest river in the Australian Region, and the 11th largest river in the world in volume of flow. The following incident, involving a massive cyanide spill into the Fly River, occurred about 1984 and was reported upon in newspapers at the time. Recently I contacted BHP officials in the US and in Melbourne and asked if they could confirm the incident but they did not confirm or deny the information, which to the best of my knowledge is true. Processing copper ore involved the application of cyanide, which was brought to the mine in 55-gallon drums by barge up the Fly River. A barge loaded with five thousand drums of cyanide was accidentally tipped into the river. Only about 500 of the drums were retrieved. The rest were lost into the river. Some opened immediately, others temporarily remained intact, only to break or rust open later. Fish, turtles and crocodiles died all the way from the site of the spill to the mouth of the Fly River into the

Gulf of Papua, a distance of about 1000 km. Impacts in the Gulf of Papua were not mentioned. Transport of large quantities of cyanide by barge up the Fly mainstream should have received careful attention in EIA reports. Whether it was mentioned I do not know, because the EIA reports have not been released publicly and my efforts to obtain them have been unsuccessful. If the hazard from barging cyanide was not mentioned or inadequately discussed, then EIA on Ok Tedi mine was faulty—at least uninformed or incompetent, and perhaps fraudulent. Companies are obligated to inform EIA consultants of all activities that might possibly have environmental consequences. Were the barge captain and his company criminally negligent when the accident occurred? Was the barge adequately designed to transport cyanide drums? Did the barge meet Australian legal standards for inland river transport of cyanide drums? These questions have never been satisfactorily answered. The chain of responsibility for the cyanide spill extends from the captain of the barge to the managers of the Ok Tedi mining operation and on to BHP executives.

However great the impact of the cyanide spill may have been, it was minor compared to the chronic impact of mine wastes on the Fly River. Under typical operating conditions, Ok Tedi mine processed 80,000 tons of ore every day. Over 70,000 tons of daily mine wastes or tailings would have to be contained somehow or else go into the Fly River—an unacceptable environmental impact. A tailings dam was built, but it gave way in 1984 and has not been replaced by an adequate tailings dam. Thus enormous quantities of highly abrasive sediments and toxic substances including mercury continue to be released into the Fly River. EIA consultants engaged by BHP incorrectly described this impact as a simple doubling of the amount of sedimentation naturally present in the Fly River. No reputable or independent follow-up EIA has been conducted on the Ok Tedi mine including its cyanide spill and tailings impacts. Reaction against BHP on the part the Australian and Papua New Guinea governments has been muted. Mining activities continue. BHP is now in financial trouble—partly due to the current Asian financial crisis, but also due to the company's poor business management. BHP would be in even more trouble if it had had to pay for the real amount of environmental damage caused by Ok Tedi mine, or if it had been required by law to build an adequate tailings dam (estimated cost A\$2 billion) and take other steps to run an environmentally safer (and possibly unprofitable) mining operation at Ok Tedi. Mining will continue for another 20 years or so, and impacts from the tailings will continue for 50–100 years after that, a BHP legacy to Papua New Guinea. And so BHP's history has repeated itself, for it left a similar legacy at home in the form of lead poisoning around the site of the original Broken Hill gold mine.

In 1995 the Melbourne legal firm Slater and Gordon filed a class action suit for A\$4 billion (US\$2.92 billion) on behalf of 6,000 Fly River villagers in the Supreme Court of the State of Victoria, BHP corporate headquarters. At the time, BHP total annual profit was A\$1.6 billion (including A\$170 million from Ok Tedi), so it was being sued for a substantial amount but one not necessarily out of proportion to the environmental damage inflicted on the Fly River. On 11 June 1996 BHP settled out of court with the Papua New Guinea villagers for A\$7.6 million (*The Nation*, 12 June 1996). It would have been interesting to see what would have happened had the court decided the issue and set punitive damages at a much higher level. If the judgment was too much for BHP to pay without going under, would the Australian government have stepped in? Can the

Australian government be held responsible for BHP's activities in Papua New Guinea?

Independently conducted and published peer reviews can publicize environmental irregularities and impacts, make development companies take EIA more seriously, and provide documentation for legal action against incompetent or fraudulent EIA consultants and careless or dishonest companies damaging the environment.

Everyone doing EIA should keep in mind that their foremost obligation is to the environment, not to any company or project. This obligation should become a legal as well as a moral and ethical obligation. Only by representing the environment can EIA companies and their consultants work for the ultimate benefit of developing countries and their citizens as well as the companies, banks and investors directly involved in development. Cover-up of negative environmental impacts in EIA reports is often unnecessary even for those with vested interests in a project. Ecologists and environmentalists realize that development projects inevitably involve at least some undesirable or harmful modifications of the environment. We only insist that negative impacts be honestly recognized and discussed, and fully considered in terms of cost-benefit analysis. We also know that some projects should never be done because of unacceptable environmental damage such as irreparable loss of distinctive kinds of habitat and/or biodiversity, public health hazards, and exhaustion of natural resources. This involves recognition of the cumulative effects and long-term costs of negative impacts, and not just the costs for the duration of the project.

A recent positive innovation has been the concept of providing "compensation" rather than "mitigation" for environmental impacts. Thus villages that have been deprived of wildcapture fisheries used to be offered hypothetical reservoir fisheries or fish ponds as a mitigation measure, even though the villagers previous experiences and other conditions were entirely unsuited to fishing in reservoirs or maintaining fish ponds. Instead, the loss of wildcapture fisheries may be compensated by giving the villagers chickens or sending their children to schools and training colleges. Concerning the loss of fishes and other wildlife in a river developed for hydropower, this may be compensated by setting aside a comparable river as a protected watershed, national park, or wildlife reserve.

Directors of "establishment EIA" companies scoff at the idea of "proenvironmental EIA." They say that proponents of the environment are naïve, that we don't know or understand the real world, that we don't know how things really get done. Actually, we do know something about how the world works—environmentally and ecologically—which establishment EIA honchos prefer not to acknowledge. We also have a good idea of how things get done in the "real world" of businessmen, politicians, and establishment EIA consulting companies, and we don't like it. The routine establishment practice of excluding the most knowledgeable, competent, and respected experts from the EIA process is not acceptable. Much of the so-called EIA work done in Mahathir's Malaysia, in Suharto's Indonesia, and in Thailand and other Southeast Asian countries has more to do with crony capitalism, nepotism and fraud than with safeguarding the environment.

The Asian Development Bank (ADB) recently engaged Seatec Consulting Company, Bangkok, as EIA consultant for ADB's Mekong Basin development plan. The future of the **Mekong basin** is too important to entrust to such establishment organizations. ADB and Seatec should be world leaders in proenvironment EIA but they are not. Seatec arguably has the best reputation and is the most legitimate EIA company in Southeast

Asia. But Seatec's recent "Draft Final Report" on the Nam Theun 2 hydropower project in Laos is an example of establishment EIA. Nam Theun 2 is brilliantly designed to destroy rivers and kill fishes, not just in the Nam Theun basin but also in the Xe Bang Fai and Nam Hinboun basins (ROBERTS, T. R. 1997, "Fluicide: an independent environmental assessment of the Nam Theun 2 hydropower project in Laos, with particular reference to aquatic biology and fishes." Bangkok, 51 pp; report submitted to the World Bank). This issue is downplayed and otherwise inadequately treated in the Seatec report as well as in the specialist report on Nam Theun 2 fish and fisheries impacts contracted by Seatec (Kottelat, M. 1996, "Potential impacts of Nam Theun 2 hydropower project on the fish and aquatic fauna of the Nam Theun and Xe Bang Fai basins, Lao PDR" for NTEC Development Group, Vientiane).

Khun Kasem Snidvong has just retired as Thailand's Minister of Science, Technology and Environment. Kasem played a key role in obtaining the passage of Thailand's environmental acts of 1975, 1981 and 1992. In his valedictory address he called for the creation of a "Ministry of Environment" in Thailand (*The Nation*, 4 October 1998). This potentially beneficial recommendation will not work as intended to deter abuse and protect the environment unless 1) the Ministry of Environment has clout equal to that of other ministries; 2) existing environmental laws and acts are rigorously enforced; 3) additional regulations are enacted, including adequate penalties for breaking environmental laws; and 4) establishment EIA is replaced by proenvironment EIA.

Proenvironment EIA also needs to greatly expand its field of operations, from consideration of "local" impacts arising from single development projects to regional and global implications of the impacts of entire industries such as agriculture, logging, mining, and fisheries. To some extent, this has already occurred. Serious questions are being raised about the effects of logging the rain forest on the global ecosystem and on global biodiversity. In other areas, however, problems of global magnitude have arisen with little or no significant EIA. For example, decline and collapse of coastal and oceanic fisheries is now so widespread that **decline of world fisheries** can be categorized as a global environmental impact. There is no doubt that over-fishing has contributed to this impact, as maintained by many local, national, regional, and international agencies. In some instances over-fishing does seem to be the sole cause of collapse of local fisheries. But surely other impacts are involved in the global decline of marine fisheries. Over-fishing, to a large extent, is self correcting. When populations of target species decline because they have been over-fished, fishing them becomes uneconomical, and fishermen either target other species or find other fishing grounds. Reduction of fishing pressure on target species then should result either in recovery of the original target species or its replacement by other species. When this does not happen, i.e. when fisheries fail to recover despite relaxation of fishing pressure, other impacts are probably involved. Fishing with bottom trawlers may severely damage sensitive habitats ranging from coral reefs to mud banks. Damming many of the world's rivers for hydropower and diverting many rivers from flowing into the sea undoubtedly has been a major negative impact on local, regional (such as Gulf of Thailand) and world marine fisheries. Even these impacts might be surpassed by largely hidden impacts from pollution.

The media and the public tend to associate the effects of pollution on aquatic life with spectacular fish kills, but less spectacular and usually unobserved impacts may well

be more profound, more chronic, and more life-threatening in the long run. Toxic substances, including pesticides, insecticides and fertilizers as well as petrochemicals and other industrial wastes probably are responsible for undocumented reproductive failure of many fish species. Such **hidden environmental impacts** are likely to be more common, more widespread, and far more serious than we realize. We need to be alert for their existence. Part of the problem is that not enough people are involved in EIA, and that specialists in disciplines with a potentially vital contribution to make are not involved in the process.

Proenvironment EIA must also concern itself with the vexing problems of what constitute unacceptable environmental impacts, and what sort of development projects and EIA reports are morally and ethically responsible. The idea that there are “unacceptable impacts” implies that there are “acceptable environmental impacts.” More research and discussion is needed to define these concepts. Acceptable impacts include those of short term duration, that are more or less self-correcting and reversing. The range of acceptable impacts might be extended by genuine mitigation measures. For example, in the case of hydropower projects, which are often extremely damaging to the riverine ecosystem and may have significant regional as well as global negative inputs to collective impacts, genuine plans for total decommissioning, including financial provisions and a fixed date, might make an otherwise unacceptable project acceptable.

Large-scale logging is an activity that has continued far too long with almost no EIA. Having devastated forests at home, logging companies from Malaysia, Indonesia, and Thailand are now busy chopping down trees in Cambodia, Brazil and Africa. Isn't this neocolonial exploitation and destruction of irreplaceable biodiversity and natural resources, and a threat to the stability of the global environment? Is it morally responsible and acceptable for Singapore to invest in such logging ventures and for Japan and the US to buy the wood products? Is it environmentally sound for Finnish pulpwood company Jago Porhyy to promote the replacement of large areas of native coniferous forests in tropical countries such as Laos with eucalyptus plantations?

Can we or should we do away with EIA? Some people insist that the world is better off with EIA. By “the world” they really mean big government, big business, the stock market, investors, and establishment EIA consultants. We need to look closely at the underlying assumptions, such as that “development is inevitable; development cannot be held back; it is necessary for the future of humanity.” For development, or whatever we wish to call it, is a selective process. We cannot develop everything at once. Development projects and processes have to be carefully considered and constantly refined or changed in the light of experience and technological advance. The **“no development” option** must be exercised far more often. Global as well as regional and local environmental considerations cannot be ignored. Environmentally destructive development would be of less menacing if it were geographically more restricted. The concept of “watershed integrity” needs to be expanded to **“global ecosystem integrity.”**

A major river basin such as the Mekong is an integral part of continental, oceanic, atmospheric, and global ecology. When a basin's natural features such as forests and hydropower are removed, they can no longer benefit the riverine ecosystem, and the river can no longer make its full contribution to the global ecosystem. More of the world's rivers, mountains, forests, deserts, rivers, coastal areas and seas need to be free of develop-

ment in order for them to contribute to the global ecology and to preserve mankind's greatest natural heritage, biodiversity. Severe developmental impacts including pollution and loss of biodiversity already affect virtually every major river system in the world, but it is still not too late to give total protection to some important tributaries. Changes in developmental philosophy and practice must be made to prevent further deterioration of the global ecosystem. The establishment views EIA as facilitating economic growth, but this is a self-serving and short-sighted viewpoint.

The “no development option” must be used much more if there is to be any hope of saving a substantial part of the world's biodiversity. The money, manpower, and infrastructure needed for any given project can always be spent on a better project somewhere else. Developing any project forecloses the option of developing the project later, when further engineering, economic and environmental studies and improved technology would permit the project to be done more profitably and with less environmental impact. The “no development” option is always reversible; for many projects, especially those with impact on biodiversity, the “develop now” option is irreversible.

The best EIA in the world is useless if economic growth, military power or other political considerations prevail over concern for the environment. Even so, I do not agree with those who claim that EIA can only function in a democratic or open society. If the authorities responsible for the **Three Gorges Dam** on the Yangtze had had a timely EIA with the correct information, they almost certainly would not have committed themselves to the project. For Three Gorges Dam there was too much EIA, by too many experts with conflicting opinions, based on outdated and inaccurate data. Most experts agreed that sedimentation will be a major impact arising from the project. Yet even those who feared sedimentation the most grossly underestimated it. Earlier EIA experts did not foresee the implications of global warming and **increased Yangtze floods**. The greater the flooding, the greater the amount of erosion and sedimentation. Peak erosion and peak sediment load occur during brief periods of peak flooding, when it is virtually impossible to observe or record these processes. Thus erosion, flooding, and sedimentation will be far greater than anyone had predicted. It is possible to conclude from this that no time should be lost in building Three Gorges to provide for flood control, but this is a false conclusion based on inadequate considerations.

Large dams provide adequate protection for floods only to a point. Three Gorges Dam is to be used primarily for hydropower generation, thus its capacity to provide flood protection will be zero if it is kept full for hydropower generation. A really large dam increases by several times the risk and the magnitude of possible damage in the event of a really large flood. A flood of the magnitude of the Yangtze flood of 1998 which threatened Wuhan may have been considered by hydroengineers as a “once in 100 years flood” before it happened. Now that it has happened the probability of another flood of equal or greater magnitude within the next 5–10 years is roughly 50%. The Chinese authorities have identified the cause of the 1998 flood as watershed deterioration, i.e. excessive removal of forest cover in the watershed, and this undoubtedly contributed. The question is whether global warming also played a role. I maintain that one of the most serious probable impacts from the Three Gorges project is one that has had practically no mention, erosion of the banks of the Yangtze below Three Gorges Dam—caused by its “sediment-hungry” outflow—and the consequent near uniform re-distribution of sediment

along the entire downstream length of the flood-controlled Yangtze. These factors will combine to decrease the competence of the lower Yangtze to remain in its streambed.

There are two likely environmental impacts of the Three Gorges project that have been grossly underestimated and should be of grave concern to the PR China government. First, the reservoir will receive far more sedimentation than predicted and thus its lifetime as an effective source of hydropower will be much shorter than expected, possibly not long enough to pay for the investment. Second, changes in the course of the Yangtze mainstream combined with global warming and continued degradation of the watershed forest may cause catastrophic floods larger than any previously experienced or predicted. Because during most years there will be average or little more than average flow and in some years flow will be less than average, hydropower engineers will urge that the Three Gorges Reservoir be kept as full as possible at all times. Thus when a really big flood comes, Three Gorges Reservoir full of water plus the flood will pose a potential man-made disaster larger than any previously experienced. The measures taken in 1998 to prevent flooding of Wuhan will be woefully inadequate. In order to protect Three Gorges Dam itself from such a flood, a diversion tunnel through the gorge of the Yangtze into the Sichuan basin may be the only useful (necessary, but insufficient) mitigation measure. Use of the tunnel would mean flooding the Sichuan rice bowl and the city of Chengdu. Regardless of whether such a tunnel is built as a protective measure, the lower Yangtze may be subject to changes of course which could cause great loss of life and property in Wuhan and Shanghai. The Yangtze would almost certainly capture (or more accurately, be captured by) the Huai Ho, the large lowland river system between the Yangtze and the Huang Ho. The combined Yangtze and Huai Ho might then capture the Huang Ho, thus flooding the Shandong peninsula. These are matters needing further EIA. The analysis is complicated by the enormous and complex human intervention in the flood-prone area of eastern lowland China, including an extraordinarily complex network of canals and irrigation projects. The very same system that might serve to contain a large flood could greatly increase the extent and the damages of the much larger floods that are almost certainly coming. No one knows or can predict accurately what the future will bring, but prudence is in order. An adequate EIA for the Three Gorges project must include measurements of the amount of ice and monitoring of the annual cycle of ice accumulation and dissipation in the Yangtze watershed in the **Hengduan mountain ranges**.

In conclusion, some suggestions that should result in better EIA:

1. People interested in ecological and environmental issues should familiarize themselves with EIA reports. Do not be put off by weightiness or bulk of the often multi-volume typical report. Most of this is due to excessive use of graphs, charts, technical diagrams (often superseded in the actual report) and tabulated data that is largely irrelevant window dressing of the piled higher and deeper variety. Much of the text is verbiage cribbed from other EIA reports. Often it is poorly organized, trivial, incompetent, superficial and otherwise inadequate. To get an overview of the project, read the "Executive Summary" and look at the simple drawings, diagrams and maps near the front of the report. Then go to the Table of Contents (EIA reports almost never have indices) and look for specific topics in which you are particularly interested or knowledgeable. Outright misstatements or lies are relatively few. Most of the dishonesty occurs

- as “errors of omission—committed on purpose, to avoid mention of environmental impacts. But please don’t take my word on the poor quality of the typical EIA report—look up some of them and find out for yourself.
2. Persons with access to a “confidential”, “secret”, or otherwise “restricted access” EIA report should consider making the document public. If you read such a document and it makes you angry, that is probably a good indication that you should pass it on to others who may be in a better position to do something about it. This can be accomplished anonymously, by making one or more photocopies and mailing them to one or more universities and/or NGOs (non-governmental organizations) concerned with environmental issues. There are a number of such organizations with headquarters in Thailand, and many more overseas.
 3. People with legal training who have thought over the implications of establishment EIA and who have suggestions about how to replace it with proenvironment EIA should put their thoughts into writing. Depending on the contents and length, such writings may be submitted for publication in the “letters” section of newspapers or as commentary or letters in the *Natural History Bulletin of the Siam Society*.
 4. Ecologists, environmentalists, and specialists in any relevant discipline should consider publishing impartial, unpaid, and unsolicited reviews of EIA reports. Such reviews need not cover the entire EIA document, but only the part or parts for which the reviewer is most competent.
 5. Institutions of higher learning with faculties or departments in sciences and engineering should develop strong interdisciplinary and multidisciplinary programs dealing with EIA. Undergraduates and graduates can examine various EIA reports and then select one to review, either as an individual or as a team effort, or they may undertake partial or full-scale EIA of a project. The best student reviews and EIAs can be published or otherwise distributed and thus might benefit the environment directly.
 6. Institutions responsible for financing development projects—including the Asian Development Bank and the World Bank—should refuse to sponsor projects for which EIA reports have not been subjected to public scrutiny and independent peer review. Peer review is relatively inexpensive and should be contracted and paid for by agencies without vested interests in the project.
 7. Government agencies responsible for reviewing EIA—such as Thailand’s Office of Environmental Protection—need to have the power to enforce their decisions.
 8. Environmental regulations need to include adequate provisions for punishment of those who break environmental laws or defy decisions of environmental protection agencies.
 9. Each country in Southeast Asia should have a Ministry of the Environment, the duties of which include official review of EIA on all major projects and the inspection, monitoring, and policing of projects with environmental impacts.
 10. Projects with major impacts—such as BHP’s Ok Tedi mine mentioned above—should have independently conducted full-scale EIA reviews periodically (perhaps every three years or every five years) and also every time a major disaster

or impact occurs. The project's own EIA consultants may assist with the investigation and data collection, but the EIA reports must be done by independent consultants.

11. International agencies should have the right to inspect and report upon environmental disasters whenever and wherever they occur. Independent consultants, NGO workers and journalists must not be denied access to environmental disaster areas.
12. EIA must take into consideration that environmental impacts usually occur simultaneously rather than individually, and their combined effects are multiplicative, not additive. Hence the worst effects of multiple impacts cannot be accurately foreseen or predicted. When the outcome is in doubt decisions must be made in favor of the environment.
13. EIA—proenvironment EIA, that is—needs to refine and extend its operations to include investigation not just of isolated projects, but of entire industries, not just on the local environment, but on the national, regional, and global environment. The reverse strategy is also valid. Local, regional, and global impacts should be identified and traced to their sources.
14. It must be universally recognized that bad projects can be weeded out for environmental grounds just as they can for economic or engineering reasons.
15. Laws governing and regulating EIA need to be greatly expanded and strengthened. They should provide penalties for individuals, companies or agencies seeking to suppress or to corruptly influence the outcome of EIA.
16. EIA should be fully completed before substantial funds are invested in a project. Investment of funds prior to completion of EIA is unacceptable as a rationale that the project must go ahead. Shareholders and other investors should hold companies responsible for making substantial investments in projects before EIA has been completed.

The objective is not to halt development, but rather to halt damaging projects with unacceptable environmental impacts and unacceptable risks, such as Ok Tedi mine and Three Gorges Dam. We live on a user-friendly planet, but we have not been friendly users. More steps must be taken to protect the environment, ensure the integrity of ecosystems, and conserve biodiversity. The “no development” option must be utilized far more often. Environmentally competent EIA consultants and their companies must be promoted, and the less honest and incompetent establishment ones put out of business. EIA is too important to be left entirely in the hands of businessmen, engineers, politicians, and financiers. Proenvironment EIA must preempt establishment EIA, and redefine and extend the scope of its activities.