

## Damming Evidence

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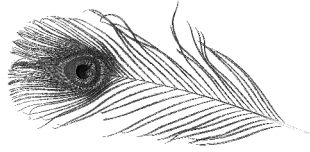
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This Series is an attempt to present the thinking behind, experiences of and learnings from CEE's programmes and projects. The papers in this Series also mark important milestones in the developments in the field of Environmental Education (EE) and Education for Sustainable Development (ESD).

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## Damming Evidence

Earlier in the year, World Water Day saw the World Wide Fund for Nature release its international policy on dams for Australia. A tough policy which says “no more dams in Australia”. WWF issued a press statement pointing out that many of the dams in Australia, and specifically in the states of New South Wales and Queensland, were, at best not essential, and at worst responsible for creating severe environmental damage. Describing state policy on Dams as being “simply mad”, a spokesman for the organisation felt that in view of the widespread damage caused by existing irrigation networks – over 1.3 million hectares of land is expected to be lost due to salinisation over the next 40 years – any fresh proposal for dams must be treated with suspicion. However the Governments of the Eastern Australian states of New South Wales and Queensland, knowing that five million hectares of land is at risk from salinisation, have yet gone ahead with proposing two more major dams in the region. The mismanagement of water resources is as big a problem in Australia as anywhere else, leading to major ecological hazards such as the dying Coorong wetlands where a progressively larger proportion of river water gets diverted before the river reaches the sea, the earlier logic being that all freshwater must be consumed before it discharges into the sea. It is only recently that the tragedy of dying wetlands, deltas and coastal zones has begun to catch the eye of the public. However, governments

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*As world demands for energy rise, there is an urgent necessity to understand the problems of environmental damage and dislocation of people associated with dams around the world. Prithi Nambiar speaks of the need for independent assessment and transparency in debating the value of dams.*

here as elsewhere in the world are still loath to acknowledge the fact, that big projects are not problem solvers; in fact, they are often problem creators and it is generally the scale that is the problem.

Starting with the fact that dams disrupt the natural flow of water and therefore impact negatively on natural ecosystems, dams have displaced people in a manner that has opened up often irreconcilable differences over resettlement and rehabilitation especially in developing countries with large populations and limited alternative sites for the resettlement of displaced people. The independent World Commission on Dams (WCD) was born in February 1998 out of the need to resolve the polarisation that seemed to have occurred on the issue of dams in a way that would establish international standards on the planning, construction and operation of dams.

There is a tremendous urgency to better understand the problems associated with large dams as the world demand for water, food and energy soars. The World Energy Council has estimated that energy demands would double between 1990 and 2020, a demand erupting most forcefully from the developing countries where per capita consumption levels have not peaked as a result of low income and lack of infrastructure. It is consequently expected that a number of developing countries will make those critical moves towards committing themselves to major investments in infrastructure in the next couple of decades.

Categorising countries of the world on the basis of a descending scale of exploitation of national potential for hydroelectric and irrigation schemes into three groups, the policy seeks to not only discourage group I nations from building more dams but to actually dismantle existing ones in an attempt to reclaim and revive wetland areas and agricultural ecosystems. The three stage policy accordingly keeps the possibility of dams open to countries with major energy needs strictly conditional on the environmental impact assessments (EIA) and all possible remedial measures that would limit the damage caused by them.

However, the policy even if international, must filter down to the local and, in the doing, must keep from being altered beyond

recognition. Armed with a strong mandate and a membership that included among others, activists like Medha Patkar, the WCD became something of a non starter in the context of major dam debates like those of the Narmada. While the international discussion paper released by WWF bristles with disclaimers that seek to establish objectivity, the fact that there is an unequivocal position on the value and virtue of dams is also equally evident from the report and the surrounding publicity released around it. The danger of taking activism on board has been to forsake all possibility of a middle ground in a world where shades of grey predominate. And this has proved costly. The outright hostility to the WCD which aborted its India visit and let it to reconsider its policy in a way that straight away recognises its ineffectiveness in country specific or dam specific contexts, was an important lesson but one that was learned too late. A WCD that was less weighted with opinion may have had a valuable opportunity to assess and mould the situation. A technical commission with an apolitical front could have had a foot in the door. But the India incident blew its cover and damaged its credibility.

While there is much to be said for establishing a framework of methodologies and tools for assessment of options and sets of international criteria and guidelines to provide decision support, these have gone the way of all fine print with positions remaining largely unaltered. The processes of so called decision making have instead become more sophisticated requiring more resources, more information. But when information required to make such analysis effective is either not current or accurate, the effectiveness of these sophisticated digestors become highly questionable as indeed does the process itself. There is now a need for independent review and assessment of technical processes in a manner that simplifies and makes transparent the major conclusions and assesses the methodology of what is being attempted. Such a system of independent review has yet to develop in countries that sorely need them.

The fact that hydroelectricity is not clean or safe is something that is only just beginning to dawn on some sections of the public. The need for energy is clearly perceived universally. The need for water

is even more so. In fact it is something that evokes the kind of mass hysteria and divisiveness that religion inspires. What then are the arguments for not building these dams?

Why is hydro electricity not clean or green? Recent studies suggest that greenhouse gas emissions (CO<sub>2</sub> and CH<sub>4</sub>) produced during the bacterial decomposition of flooded peat and forest biomass could be substantial in the case of large reservoirs as has been evident from early data relating to hydro-electric reservoirs in Canada. It is said that the Balbina dam in Brazil had 26 times more impact on global warming than emissions from an equivalent coal fired station. The disturbance caused by the construction of a catchment area and the dam and its related components, the tremendous loss of biodiversity, displacement of people, the erasing of their cultural history and in some cases their distinctive identity caused by inundation of fertile cropland and ancient forests have been recorded in the cases of large dams around the world. The Balbina dam in Brazil inundated an area of 2750 square kms, the Srisailem project flooded 43,300 ha of farmland taking away the livelihood of 100,000 displaced farmers. And this is hardly the only instance where dams have impacted India.

What are the other problems with hydropower? Water quality in the reservoirs is affected by the decomposition of vegetation that produces noxious gases that are harmful to aquatic life. Still water leads to low oxygen in the lower depths of reservoirs making it uninhabitable for fish.

Mercury contamination occurs as it leaches into the water from rocks and soil, water weeds proliferate in stretches of stagnant water causing oxygen and water loss. Silt accumulation leading to heavy sedimentation actually reduces the capacity and efficiency of dams drastically over the years.

Silt gets deposited in entirely the wrong places ending up clogging machinery behind the walls of the dam rather than along coastal areas which face erosion as a consequence of this diversion of essential silt. Not only are the lands deprived of fertility, they are also exposed to life threatening floods and cyclones. While initially

dam reservoirs seem to provide opportunities for freshwater fisheries, this is often not found sustainable for water quality reasons. Not enough is understood about the dynamics of the reservoir based freshwater fisheries industry.

The possibility of dam bursts, landslips and seismic activities are often put in the acts of God category and are rarely considered avoidable although dam disasters have caused tremendous destruction in the past. Who has forgotten the Morvi dam disaster which killed 10,000 and more? Apart from the risk in the structure of the dam walls, there are serious instabilities caused by the ecological impact of the dam. The erosion in upstream areas due to the loss of vegetation and top soil makes landslides a regular feature. Seismicity is known to become a major risk where large bodies of water have been impounded.

The major changes caused by damming a river can be compared to the diversion of the circulatory system, where blood pools in areas, cutting off life from some parts and congesting others. The dangers of altering an ecosystem which has fallen into stability over time are rarely understood.

The dams, irrigation systems and their associated engineering structures cause drastic changes to the ecology and management of floodplains and other wetlands, reducing or eliminating downstream flooding cycles, altering water chemistry, discharge and sediment behaviour and blocking and interrupting the migration of fish. The new bodies of open water they create have their own ecological systems that differ from previously existing systems.

New areas of concern are not only the contribution of greenhouse gas emissions but the role of dams in the global rise of sea levels. The loss of shoreline and fluvial sediments which are being diverted from coastal delta areas is contributing to the inundation of these low lying areas by the sea. In Bangladesh for example it is expected that 18 per cent of the land would be under water by 2050 with 209 cm increase in sea levels.

These are serious problems but why has there been no thought paid

to the essentially destructive nature of the developmental model which we are unable to abandon? Why is it that developed nations are still facing problems with assimilating clear evidence of the undesirability of allowing the market to vacuum in nature and its resources at a rate impossible to sustain? It is still hard to understand that the issue is actually survival and not the intellectually remote term “sustainability”. The term survival is still seen as the language of green flag waving activism with no place in boardrooms or political platforms.

This is the consequence of the original pioneering process that has driven modern civilisation based on the drastic reordering of nature for a single purpose: consumption or the satisfaction of human needs and wants. Which would have been understandable if needs were limited but human needs and wants are not.

This primary drive clearly continues to ensure the skewing of the system in such a way that self interest and the need to secure resources prevent its reorientation even in the light of scientific evidence pouring in from all affected sectors. The fact that this situation exists all over the world is not unknown but public awareness and participation in decision making processes is still the only way to ensure that the interests of the majority are served. The EIA was one of the evaluative tools that sought to make this possible. But there have been difficulties with this.

Despite the fact that statistics and related information are being extensively recorded, the manner in which this information is being interpreted to minimise socio-ecological costs is something that makes these evaluation processes suspect. It is important to understand the pressures that work the system. The EIA is commissioned and paid for by the company that requires it. It is not difficult to understand why a report produced in such circumstances would scarcely seek to shoot itself in the foot. What often goes on is extensive processing of information and presentation of facts that gloss over the inadequacies and build on the advantages. Dissimulation is now an art and an industry. Add to this the fact that the technicality of the report does not make it easy for the public to understand or analyse the facts or assess the methodology that has

been used. This is assuming that the reports are easily available which is hardly the case.

But what are the alternatives? Small dams? Small dams are normally those that are under 15 metres high, but they remain debatable options. Micro hydropower projects sometimes fall victim to the same problems that large dams do if they are not planned properly. In Laos, bad planning had caused two successive dam bursts due to poor understanding of the flooding cycles and the rainfall patterns. A series of small dams may not create energy more efficiently than large dams do. The answers are not readily available.

And mankind has been used to damming rivers for centuries from what we know of the earliest civilisations of the world. The first large modern dam was built in Britain in 1787 and all newly independent nations including India moved fast and eagerly to secure the “commanding heights” of the economy by sanctioning mega hydro projects. From the happy days of the Fifties and Sixties and even today although much water has flowed under the bridge, the mega dam continues to be seen as a symbol of progress, of man’s supremacy over nature, of prosperity and of pride. Development aid programmes like those of Canada’s favoured large dam projects under tied aid agreements that exported their water development expertise to developing nations. In the Seventies, some notice was taken of the widespread damage caused to the landscape by dams. In the Eighties, the socio-economic costs of large dams began to be recorded across the world.

But it was only in the Nineties that social impact of the dams brought ecological and economic arguments to the fore as marginalised and displaced communities found their voice in the political arena. However, the large dam era is yet to end as politicians still push the big dam for its strategic value as a politically attractive statement of commitment to progress. The emotive argument of water is a powerful vote puller. The magic of development in terms of individual material prosperity is too strong to resist.

And this is true even of countries like Australia where the

developmental pull of the dam is still strong as plans are underway to build two more. The battle for water resources among pastoral, agricultural and industrial users is stiff because the needs are excessive as all resource use is large scale. Even though nearly 70 per cent of the water in the Murray-Darling basin, a major river basin in eastern Australia has already been diverted for commercial use, the province of Queensland has made the decision to build a large dam in the headwaters of the same basin. Almost every major river in western New South Wales has a dam on it. The extensive redistribution of the waters of the rivers has resulted in some wetlands drying up almost totally while others like the wetlands along the Murray river are inundated permanently destroying spectacular ancient trees like the redgums. The policy on dams seeks to move for a no dams policy for nations that have reached full exploitation levels. This would introduce flexibility into an international system by allowing some nations to build those absolutely essential dams albeit very reluctantly and after fulfilling a battery of prerequisites. WWF sees Australia as a developed nation with a responsibility to “stop behaving like a developing nation”.

Australia, therefore, would need to not only not build any more dams but to retrofit existing ones. In the U.S., dams are being removed to enable the return of salmon and migratory species and return rivers to their original pattern of flow. Australia is being urged to follow that example to restore the natural variability of river systems and the thermal quality of its water to protect and restore its native bio-diversity. Salinisation of extensive stretches of soil as well as the poisoning of impounded water by toxic blue green algae is making stored water unsafe for drinking across three quarters of dams in New South Wales.

Linked to this debate is the issue of privatisation of the energy industry as it has been seen that privatisation will lead to further ecological degradation. The most serious issue still remains to be the active testing and development of alternatives to dam technology which the developed world needs to invest in before a more viable alternative can be adopted. It is important for nations around the world to recognise that ecosystem sustainability is essential to the maintenance of stable growth and productivity. If

this were accepted then it would be easier to prioritise ecosystem health and adjust technologies appropriately. If countries need to be motivated into foregoing energy options, it is suggested that direct monetary compensation or technological assistance be provided for those nations that have protected their unique spaces and species by raising levies on hydropower; Through constituting an International River Fund to support conservation and rehabilitation of major river systems of the world; Through developing guidelines to restore the ecological health of disrupted wetland ecosystems and persuade all countries to internalise all environmental costs which are today better known in order to get users of these services to pay for them. However, the internalisation of ecological costs or even of all cost into the price of services that have traditionally been regarded as essential services is a tremendously politically unattractive solution. Governments will need to look at alternatives more seriously and international development aid policy that supports sustainable technology is the only way to point nations in the right direction.

Further information is now becoming available relating to the dying utility of the large and celebrated dams of the world like the Aswan Dam which is causing the coastline to recede, the decline of fisheries and a rising water table that is endangering the area. The displacement effects and the large scale destruction caused by dams have been disguised to some extent by the sheets of water and the hum of energy. But now rising above the spray of water is the spectre of human error, the voices of submerged identities and cultures of the past and the restless spirits of lost forests and wildlife.

## **Centre for Environment Education**

Centre for Environment Education (CEE) is a national institute established in 1984. It is engaged in developing programmes and material to increase awareness and concern, leading to action, regarding the environment and sustainable development. CEE is a Centre of Excellence supported by the Ministry of Environment and Forests, Government of India. CEE has, over the last two decades, explored the emerging models of development to identify and promote those which are contextually sustainable.

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