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Water Resource Planning

Changing Perspectives

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Water resources planning in India has largely meant irrigation development through big-dam projects. Over the years a powerful movement has emerged against such projects. The paper spells out the issues involved and the opposing views. There is a sharp polarisation of attitudes on this matter. The World Commission on Dams established by the World Bank and the World Conservation Union (IUCN) in order to resolve this impasse is expected to submit its report in the year 2000. A crucial question in this context would be whether there are effective alternatives to large dams for meeting the future needs of water and energy. There have been some very successful local initiatives in watershed development and social transformation, which seem to indicate that significant results can be achieved through these means. What is needed is a major reorientation in the approach to water resource policy. The paper sets forth some recommendations in this regard.

I

IN India, the idea of 'water resources planning' is of relatively recent origin. In the past, irrigation and to some extent hydro-electric power were the main concerns; and this largely meant the undertaking of several big projects, of which perhaps the most well-known example was Bhakhra-Nangal. In recent years, however, there has been much opposition to large-dam projects on several grounds: and there is a growing advocacy of a change in the approach to the planning and management of water resources. The present paper will give an account of these changing perspectives, set forth the issues involved and outline an approach. It is intended to be a broad *tour d'horizon* rather than a scholarly paper, and it is addressed to all those who are interested in issues of public policy, in government (at the political and bureaucratic/technocratic levels), in academia, in the media, and in the general public.

II

In pre-British India water-management was essentially a local matter and was in the hands of the community. This changed with the advent of the British period and of 'modernity'. Control over water resources passed from the hands of the community into those of the state. While ownership of natural resources was claimed by the state, management passed into the hands of engineers and bureaucrats. The induction of western engineering ushered in the era of large dams and there was a concomitant decline of traditional forms of small-scale, local, community-managed

systems of water-harvesting and management. The new projects became symbols of 'development' and came to be regarded as 'the temples of modern India' (in Nehru's famous phrase).¹

The basic syllogism in the modern engineering approach to water resources development proceeds.

– from the spatial and temporal variability in the availability of water (the concentration of precipitation in a few months or even weeks of the year, and the fact that the different regions of the country vary from conditions of excess rainfall to arid or drought-prone conditions),

– through a view of rivers as 'surface water resources' to be 'harnessed' and 'exploited' for human use with the instrumentality of science and technology; the understanding of 'use' to mean 'abstraction' (largely for irrigation); and a tendency to think of water that flows to the sea as 'wasted',

– to the conclusion that projects need to be undertaken for the large-scale storage of river waters and their transfer over space and time.

This is reinforced by the economic or developmental syllogism which proceeds from an equation of development with ever-higher consumption and the exaltation of demand as sacrosanct to the formulation of supply-side solutions in the form of large projects.

(The very expression 'water resources development' has acquired a specialised meaning in India: it is implicitly taken to mean dam-and-reservoir projects).

There has been a long-standing pre-occupation in this country with the idea of a transfer of surplus waters from the northern and central rivers to the southern

parts of the country which are chronically water-short. Several decades after K L Rao mooted a Ganga-Cauvery link or Dastur talked about a 'Garland Canal', those ideas still continue to beguile the general public. From the 1980s onwards the National Water Development Agency has been studying possibilities of storages, links and transfers. In the deliberations of the National Commission on Integrated Water Resources Development Plan (set up by the government of India in 1996 and expected to submit its report by the middle of 1999), an important theme is 'inter-basin transfers'. There is also a desire to tap the abundant waters of the remote Brahmaputra river and take them to the areas where they are felt to be needed. In energy planning, a much-canvassed proposition is that there is a huge hydro-electric potential in the Himalayan rivers and that this should be realised through a number of gigantic projects: the entire focus in Indo-Nepal talks on water resources has been on large projects such as Karnali, Pancheswar and Saptakosi.

However, disenchantment with large projects has been growing during the last two decades or so. The Silent Valley Project in Kerala was abandoned. The Narmada (Sardar Sarovar) Project in Gujarat and the Tehri Hydro-Electric Project in the Himalayan region have been stalled by strong anti-project movements and their future will depend on the final outcome of public interest petitions pending in the Supreme Court. A similar anti-project movement seems to be gathering strength against the Kalabagh Project in Pakistan. In Nepal, too, there is some opposition to the big

projects mentioned earlier, and in one case, namely, Arun III, the World Bank found itself obliged to withdraw from the project. Even in China, there is some dissidence, though muted, on the Three Gorges Project. Projects proposed long ago in the north-east of India (Dihang, Subansiri, Tipaimukh) and in Bhutan (Manas, Sankosh) have made hardly any headway because of opposition on diverse grounds. No large-dam project in the future is likely to have an easy passage. The earlier tacit consensus on such projects has clearly broken down: the statement that they are 'the temples of modern India' no longer commands universal assent. Some of them have become highly controversial and some face fierce opposition. How did this happen? The answer lies in a convergence of dissatisfactions with such projects from diverse points of view:

(i) *financial/economic*: unconscionable delays in the completion of projects; repeated changes in scope and modifications in design; an insatiable demand for resources, imposing severe strains on the government budget and crowding out other worthwhile investments; the increasingly unaffordable capital cost per hectare of what goes by the name of 'major irrigation'; the failure of many projects to achieve the projected benefits; their inability to generate revenues for re-investment or even for proper maintenance, partly because of the poor pricing of irrigation water;

2. (ii) *'political economy' aspects*: the powerful influence of vested interests in the planning and implementation of projects; the widespread prevalence of corruption; collusions and nexuses among bureaucrats, engineers, politicians, consultants, contractors, etc; serious inequities in the incidence of costs and benefits - viz. costs borne by one set of people and benefits gained by others, benefits accruing largely to the big farmers, excessive water use by the head reach farmers leading to limited and uncertain availability to the tail-end farms, etc;

(iii) *environmental/ecological concerns*: ranging from an enumeration of specific adverse 'impacts' to fundamental criticisms of the technological hubris and the pathological relationship to nature that characterise such projects, and a questioning of the underlying notions of 'development'.

(iv) *concern about the displacement of people and dissatisfaction with rehabilitation policies and practices*: including, as special cases, criticisms of the adverse impact of such projects on weak and disadvantaged groups, tribal communities, women, etc; and

(v) *the movement for the 'empowerment' of the people vis-a-vis the state*: the restoration to the community of the earlier control over common resources, etc.

All these strands are important, but the environmental and displacement aspects are at the heart of the controversy.

III

The environmental and other 'impacts' are project-specific and vary from case to case; but the following is a generalised account in compendious form.

(i) The very processes of project construction in remote and often pristine areas (cutting and blasting, movement of large trucks and heavy earth-moving equipment, generation of noise and dust on a large scale, establishment of construction colonies, induction of large numbers of people from outside, etc) involve a violent disturbance of nature and a tremendous upheaval in the lives of local inhabitants (often tribal communities);

(ii) The creation of a large reservoir (and the construction of a system of canals) means the submergence of land (agricultural or forest land, and sometimes rural and urban settlements), the displacement of people and their livestock, the loss of occupations, and so on. (Land is also taken away for project 'colonies');

(iii) The stilling of flowing water brings about drastic changes in its morphology and quality (temperature stratification, variations in nutrient content and dissolved oxygen at different levels, etc) which have grave consequences for aquatic and riparian life. The decay of submerged organic matter could also lead to emissions of some greenhouse gases;

(iv) The most serious impact of the damming of a river is on the fish population, which is doomed to decline rapidly because movement is impeded and spawning hindered;

(v) The reservoir spells danger for wildlife through possibilities of drowning or marooning; habitats and routes of movement are disrupted; groups and inter-dependent species could be split and food-chains broken: some species could disappear, and this in turn could affect other species. (Communication links between human settlements could also be disrupted by the reservoir);

(vi) Flora too could be affected through the construction processes, submergence and other factors. Some species (endemic and/or rare) could be endangered, and herbs and medicinal plants of local or wider importance lost.

Taking the loss of forests and the impacts on flora and fauna together, there could be considerable loss of bio-diversity.

(vii) The reservoir and the canals could facilitate the spread of disease vectors and could lead to the increased incidence of malaria, filaria, schistosomiasis, etc;

(viii) The creation of a large water-body could bring about climatological changes;

(ix) Projects in seismically active areas, such as the Himalayan region, are subject to the risk of earthquakes and their possible impact on the dam and the slopes of the reservoir. There may also be possibilities of re-activation of old and dormant faults. An important issue on which there is considerable difference of opinion is that of 'reservoir-induced seismicity' (RIS);

(x) The damming of a river affects the whole river regime. Flows as well as the silt load and nutrient content downstream of the dam would be substantially reduced, and this would have an impact on lives, occupations and livelihoods downstream (fisheries, the plying of boats, agriculture, settlements alongside of the river, industries, etc). Estuarine conditions may also be adversely affected (decline in fish population, the incursion of salinity from the sea, etc). The reduction of flows also means a deterioration in water quality and an increased concentration of pollutants in the river downstream of the dam. A further consequence of reduced flows is a decline in groundwater recharge;

(xi) In some cases, structures of religious, historical or cultural importance may be in danger of submergence or damage;

(xii) There is an inherent and unavoidable risk in the damming of a river. Under normal circumstances, and having regard to the design, a dam could conceivably moderate floods; but in the event of the occurrence of floods of an order higher than the 'design flood' the dam itself could become the source of great danger.²

(xiii) The construction of canals could (unless great care is taken) disrupt the natural drainage leading to drainage congestion. In the command area, the practice of canal-irrigation for some years could result in the emergence of water-logging conditions and the salinisation of land, and in some instances valuable agricultural land may go out of use;

(xiv) Lastly (though this is not a necessary consequence of dams), the belief in the virtues of dam-building and extension of irrigation often leads to the application of these ideas in the wrong places. (For instance, irrigated agriculture may not be the best option for a desert area; and the attempts to convert nomads to settled agriculture, or failing that, to induct

agriculturists from other areas, as was done in Rajasthan, may not be the wisest thing to do.)

That was a summary and simplified account of the kinds of consequences that large-dam projects could have. Not all of them occur in all cases, nor are they all of equal importance, but quite a number are common to many projects and many of them are indeed matters for concern.

IV

These implications and ramifications of large-dam projects were not well understood in earlier years, but they are now widely recognised. Not even the most ardent advocates of large dams will deny their negative aspects. Faced with a catalogue of ills, their response will be threefold.

First, they will readily concede that all these 'impacts' need to be studied fully and thoroughly. There is a general agreement that proper 'environmental impact assessment' (EIA) studies must be made in all cases; that this should be a part of project formulation *ab initio* and not an exercise to be undertaken to meet an external requirement after the project has been prepared; and that the EIA study should be an important element in the process of project appraisal. EIA is now a standard requirement, and both the Central Water Commission and the ministry of environment and forests have laid down detailed guidelines on scope, coverage and methodology. A clearance by an Environmental Appraisal Committee under the ministry of environment and forests is a pre-requisite for final investment approval to all big projects.

Secondly, it will be argued that once a full EIA is available, what is needed is merely the reckoning of all the environmental and displacement aspects as 'costs' (in addition to the direct financial costs) and the balancing of these costs against the 'benefits' which the project will bring (increased agricultural production resulting from irrigation, increased industrial activity made possible by hydroelectric power, their multiplier effects, etc) in a thoroughgoing cost-benefit analysis.

Thirdly, it will be pointed out that the planning of a project would include the formulation of detailed measures to remedy or mitigate or compensate for the adverse impacts of the project (catchment-treatment programmes for arresting the deterioration of catchment areas and restoring degraded parts; compensatory afforestation schemes for offsetting the loss of forests; devices such as fish ladders to facilitate the movement of fish; escape

routes, corridors and alternative habitats to mitigate the distress of wildlife; the development of reservoir fisheries to make up for the decline in fish populations in the river; preventive and curative public health measures to combat the incidence of water-borne diseases; elaborate rehabilitation 'packages' to help project-affected people to cope with the pain of displacement; measures such as improved drainage and the conjunctive use of groundwater and surface water to counter the emergence of water-logging or salinisation in the command area; and so on).

V

Unfortunately that line of argument ignores several serious difficulties.

In the first place, environmental and other concerns continue to be regarded as disagreeable external impositions; they have not become integral parts of project planning from the start, despite many 'guidelines' and instructions to this effect. Everyone pays lip-service to those concerns, but the prime interest is in the engineering aspects. The implicit assumption is that water planning is essentially a matter for engineers. (It is significant that the Central Water Commission which regards itself as the apex body for water planning in this country is not a multi-disciplinary body encompassing agriculture, environmental sciences, economics, sociology, law, etc, but is merely a body of engineers.)

Secondly, EIA studies are notoriously undependable. When they are undertaken in-house by the project planners, the desire to get the project approved may influence the EIA and render it suspect. Even when a reputed external consultancy firm is engaged (as is often the practice), the thoroughness and objectivity of the study cannot be taken for granted. It needs to be recognised that the insidious pressure on the consultant to be 'positive' about the project could be very strong: to say this is not to imply that there is collusion between the project-planner and the consultant. The latter has an interest (not necessarily conscious) in coming to the conclusion that the adverse impacts of the project can be remedied or mitigated or compensated for; that the project will still remain viable; and that the overall balance of costs and benefits will be favourable to the project. A consultant who says: "The impacts of this project are too grave to be mitigated or offset: the project should not be undertaken" is unlikely to secure many assignments. It is only a disinterested examination by an independent appraisal agency, say, the ministry of environment

and forests or an agency appointed by it, that could be expected to be truly neutral and objective. Even that agency could come under strong pressure from other agencies within the government to be 'positive' and supportive of 'development'.

Thirdly, it is unrealistic to imagine that any EIA, however careful, can be made truly comprehensive and exhaustive. Large-dam projects often constitute horrendous interventions in nature, and it is impossible to foresee all the consequences of such enterprises. Despite extensive studies there may be many aspects, dimensions and ramifications which have not been taken note of. (This is not a general *a priori* statement, but has in fact been found to be the case in several instances).

Fourthly, it is not always possible to remedy or mitigate or compensate for the ill effects of such projects. For instance, what goes by the name of 'compensatory afforestation' is a delusion. It is rarely feasible to create a new 'replacement forest' in the neighbourhood of the existing one which will be submerged, or in the same ecological zone; quite often the compensatory afforestation takes place in a distant and very different area. Further, while such afforestation may be a successful effort and may evolve into a new ecological system in due course, what is lost cannot be replaced: that ecological system is gone forever. Again, the changes in river morphology and water quality brought about by stilling a flowing stream, and the impact of such changes on aquatic and riparian life, simply cannot be remedied. The decimation of fish populations by the damming of a river is also totally inescapable; fish ladders, etc, rarely work satisfactorily, and the development of new reservoir fisheries is no answer to the distress and disaster inflicted on existing fish populations. Similarly, once a dam is built, the river will never be the same again; flows downstream will necessarily be reduced, with unavoidable consequences for aquatic life and riparian communities. Displacement because of submergence, again, is inescapable, and rehabilitation 'packages', however enlightened and generous, do not always work well in practice.

Fifthly, the cost-benefit calculus is a flawed basis for decision-making because: (i) it is susceptible to manipulation (costs are usually understated and benefits overstated); (ii) it is necessarily incomplete and inadequate (not every aspect or dimension can be brought within the ambit of the calculus); and (iii) it is morally blind

(the infliction of misery on some people is often sought to be justified on the ground that a larger number elsewhere will benefited).

Pious declarations about giving the project-affected persons a share in the benefits downstream are rarely translated into practice. References to 'stakeholder participation' have now become fashionable, but it is doubtful if this indicates any depth of concern about such matters. Indeed, the very term 'stakeholder' is ironic: in what sense can the hapless communities uprooted from their centuries-old habitats for the construction of projects be regarded as 'stakeholders' in those projects, when they are in fact the victims of the projects?

Finally, these are the benefits (direct and indirect) of a project which are held to justify the costs (financial and social); and that justification (i.e. the case for the infliction of misery on people and damage on the environment) tends to get undermined by the fact that the costs are certain to be incurred and are almost always higher than projected, whereas the claimed benefits are often problematic and may not be fully realised.

VI

In this context it is necessary to take note of some apparently clinching arguments in favour of large projects.

A point made by some supporters of such projects is: yes, doing things has a cost; but there is also 'the cost of not doing'. This argument is often reinforced by the rhetorical question: where the country would have been without Bhakra Nangal? Many find this line of argument persuasive. However, this is not a new or additional argument, but only a familiar one in a different form. "The cost of not doing" means merely that in the absence of the project certain benefits would not be available. This is nothing more than the old argument that the benefits justify the costs; we have already dealt with this. Further, it is fallacious to equate the non-undertaking of a large project with 'not doing'. The choice is not between 'doing a project' and 'not doing anything': there are other things (such as demand management, conservation, local water-harvesting, etc) that can be done. As for the question of what we would have done without Bhakra Nangal, it is a hypothetical one to which only a speculative answer can be given. We know the Bhakra Nangal 'scenario' because that is what actually happened; we do not know what the alternative history would have been. However, we need not readily assume that

it would have been one of an absence of development on the agricultural front. Understandably, data and information are available only in respect of the route (of large projects) actually taken, and not in respect of the alternative routes that have not been explored. All that one can do is to point to the successful instances of watershed development and social transformation and say that there is no reason why these cannot be replicated in large numbers.

Another seemingly powerful argument is that even if there is no need for large projects for irrigation, they are definitely needed for the generation of hydroelectric power; that given the magnitudes of demand projections large additions to generating capacity are called for; that a suitable thermal-hydro mix is required for maintaining a proper balance between base-load and peaking capacities; and that hydroelectric power is 'clean', i.e. it does not create the kind of pollution that is incidental to coal-burning. Certainly, both the power shortage problem and the peak demand problem need to be dealt with; but centralised generation in large projects is not the only answer to those problems. It has been argued (by A K N Reddy and Girish Sant, among others) that through a combination of demand management, energy-saving, technological improvements, and getting more generation out of capacities already installed, the need for additions to capacity can be greatly reduced; that significant additions can be made through extensive decentralised generation; and that if this approach was adopted very few large projects would be needed. This proposition, which runs counter to the establishment view, has not been given serious consideration. As for hydropower being 'clean', the fallaciousness of that argument has been definitively brought out in Patrick McCully's *Silenced Rivers*. While the operation of a hydroelectric station may not emit harmful gases or spread particulate matter as coal-burning does, the construction of the project and the existence of the reservoir itself have a whole range of severe environmental consequences, as we have already seen: such a project can hardly be described as 'clean'.

It is also argued that the big cities (Delhi, Mumbai, Calcutta, Chennai) are very short of water and that only large projects can meet their needs. This is an unexamined assumption. There is enormous scope for the augmentation of supplies to such cities through local efforts (in addition, of course, to proper demand management). Realising that the prospects

of water from distant projects are remote and uncertain, Delhi is now seriously exploring the possibilities of local augmentation through increased storage in existing channels such as the Najafgarh Nalla, re-activation of old and disused water-bodies such as the one at Hauz Khas, roof-top collection of rain-water, and other similar means. The idea of roof-top collection also seems to be catching on in Chennai.

The proposition that the future needs of water, food and energy can be met through alternative means and that large dams are not required is confidently asserted by some, but it cannot be said to have been fully established: further work on this is necessary. Indeed, this is the crucial question for consideration. However, those who are against large dams would say that in any case dams do not serve the projected purposes but do far more harm than good, and that the establishment of alternatives cannot be a pre-condition for rejecting something we know to be bad. That is an argument that deserves the most careful consideration.

VII

At this stage it may be useful to refer to my association with two major project review committees. I was a member of the 'Five Member Group' set up by the ministry of water resources in August 1993 to go into several issues raised by the Narmada Bachao Andolan; it submitted its report in April 1994, and then, on the directions of the Supreme Court, a further report on certain specified issues was submitted (by four members) to that Court in April 1995. I was also a member of the High Level Expert Committee (set up by the ministry of power in 1996) on the environmental and rehabilitation aspects of the Tehri Hydro-Electric Project; the committee submitted its report in September 1997. I learnt a great deal from my work on these two committees.

Such reviews have to proceed against considerable resistance. There is a tendency to treat the project as sacrosanct and to keep on saying that while social and environmental issues should be looked into, the project must go on and must not be disturbed. It is of course possible to understand the consternation and dismay that project planners and managers feel when basic questions are raised at a late stage. One can also appreciate the point often made that the processes of appraisal and review must come to an end at some stage; that there should be some finality to investment decisions; and that a project should not thereafter be subjected to the

uncertainties of repeated reviews of a fundamental nature, each one necessitating a suspension of work on the project. However, if in fact the doubts raised and questions asked are of a serious and substantive nature and satisfactory answers are not forthcoming, and if there is reason to believe that these had not been adequately examined in the earlier processes of appraisal, should one rule out a fresh examination on the ground that there should be 'finality at some stage'?

It is often claimed that the Sardar Sarovar Project is one of the most elaborately studied of projects, but nevertheless not all the environmental impacts and ramifications of the project are known even now: for instance, the impact of reduced flows downstream of the dam (on the occupations of fishermen and boatmen, on downstream aquatic life and riparian communities, and on estuarine conditions) had not been adequately studied earlier. Again, while in general terms it was known that wildlife would be affected by the creation of the reservoir and that measures must be taken to minimise hardship, not enough preparatory work was done in advance. On the question of seismicity some work was done in the early stages of planning based on the prevailing state of knowledge, but after the Latur earthquake this has become an aspect which needs to be further studied. Similarly, in the case of Tehri not enough work has been done on issues such as impact on flora and fauna, water quality, rim stability, etc; and on the seismicity aspect, which was referred to a separate expert committee, a difference of opinion among the experts continues.

The *pari passu* condition which was introduced when the Sardar Sarovar and Narmada Sagar projects were given conditional clearance has been misinterpreted and has not really worked. The original intention was that construction work should not proceed ahead of environmental and rehabilitation measures, but a common argument is that in such projects of long gestation there is plenty of time for environmental and rehabilitation measures, and that these can be taken up in due course in the light of the progress on the construction front. Thus, instead of progress on the environmental and human remedial measures determining the pace of project construction, the relationship has been reversed.

(The resistance of the engineering establishments to environmental concerns is illustrated by the tendency to quibble about catchment-treatment work: project authorities agree that this is necessary but

are reluctant to undertake it as part of the project; they argue that the cost of such work should not be debited to the project. They try to make a specious distinction between 'directly' and 'indirectly' draining catchments, i.e. the immediate catchment which drains direct into the reservoir and the catchments further upstream which drain into the river or a tributary and eventually into the reservoir).

Turning to the human aspects, we once again find that the impact is never fully known in advance. For instance, in the Sardar Sarovar Project, the Narmada Tribunal had estimated that the number of families affected by submergence would be around 7,000; the number is now put at 43,000 families, and this is not a final figure. Besides, this is only the number of families in the submergence area; other categories affected by the project such as those who come from outside to provide supplies and services to people in the submergence area and who stand to lose their livelihoods are not included in this number, nor is the category of canal-affected people. Moreover, some of the environmental remedial measures such as compensatory afforestation and catchment-treatment, and even the resettlement of project-affected persons (PAPs), could in turn have an adverse impact on people already living in the areas chosen for such purposes, and could lead to what is referred to as 'secondary' displacements (and these could result in further displacements!) Thus, the number of project-affected persons (PAPs) keeps growing and is never finally known.

Further, there are serious deficiencies and failures in the implementation of the rehabilitation package. There is not enough land for the 'land for land' principle; the 'cluster' approach of keeping communities together is not easy to implement: some families get pushed into distant areas; the relationship with the host community in the resettlement areas is uneasy; some groups are forced into totally unfamiliar ways and environments; and so on. More than anything else, the implementation is often marred by bureaucratic sloth, inefficiency and callousness. There are often considerable delays in compensation payments, the giving of title to land or the provision of promised facilities in the rehabilitation areas. When difficult issues come up, there is a tendency on the part of the administration to find short-cuts or simplistic answers. When serious problems arise, there is first a tendency on the part of the administration to deny that they exist; then belatedly they are recognised; and still later some kind of half-hearted

solution is found: it is generally a case of too little and too late. An effective grievance-redressal machinery is absent; and when resistance to displacement develops because of hardship, the state tends to react with incomprehension and force.

It was because of all this that some critics (for instance, the controversial Morse Commission, i.e. the Independent Review set up by the World Bank on the Sardar Sarovar Project) go so far as to make the general statement that rehabilitation is impossible. Without necessarily subscribing to that sweeping statement, it must be conceded that resettlement and rehabilitation in the case of such large projects certainly present enormous difficulties. Even in the SSP, despite a rehabilitation policy which marks a great advance on earlier projects, resettlement/rehabilitation has run into serious problems, and much hardship has been suffered by the affected people. As for Tehri, 15 years after displacement the original PAPs have still not been properly rehabilitated and are living in miserable conditions. (There is also much talk of corruption, though one does not know the precise extent of its incidence).

The state suffers from an inability to work closely with the people or with the NGOs representing them. The general governmental attitude is well-illustrated by the belated and grudging response to Medha Patkar's and Sunderlal Bahuguna's critiques (of the Sardar Sarovar and Tehri Projects respectively), and the disingenuous manner in which review committees in these two cases were set up: hopes initially held out of extensive discussions were belied, and the scope of the review was severely restricted. (Even the word 'review' was carefully avoided in the SSP case!).

It may be added that despite much talk of integrated planning for a hydrological unit such as a basin or sub-basin, planning in this country continues to be essentially project-based. The basin merely provides a background for this, and the language of 'integration' is merely a formal gesture in the direction of currently fashionable terminology. Planning understood on the above lines tends to remain in the hands of the state, i.e. bureaucrats, technocrats and ministers: there is hardly any room for this kind of approach for participatory, community-based planning.

VIII

As mentioned earlier, several kinds of criticism have converged into a powerful movement against such projects, both within the countries concerned and in

nationally. There is a sharp polarisation of attitudes on this matter. Unfortunately the debate between the 'pro-dam' and 'anti-dam' points of view is marred by hostility and prejudice on both sides. There is an impasse on this issue.

The pressure of the anti-project movements, the sharing of some of their concerns by certain governments, the desire of both governments and the dam-building and equipment-supplying industries to bring the uncertainty surrounding such projects to an end, and the World Bank's own desire to obtain a clear mandate on this matter, led to an unprecedented consultation conference at Gland in Switzerland in April 1997. Following that consultation, the World Bank and the World Conservation Union (IUCN) have together established a World Commission on Dams (WCD) with a composition reflecting different concerns and interests. The commission has begun its work and is expected to submit its report in the year 2000. One wonders whether the WCD will lay the controversy to rest with a definitive pronouncement or confound the confusion further with a split report. (The WCD had to abandon a public hearing planned in India because of objections by the government of India at the instance of the Gujarat government which did not want the Sardar Sarovar Project to be discussed – hardly a promising start to the work of the commission.)

IX

The feeling that changes are needed in the prevailing approaches and attitudes to what has come to be known as 'water resources development' (WRD) had begun to emerge even in the 1980s when the country's National Water Policy (NWP) was being formulated. The NWP (in the initiation and drafting of which I played a certain role as secretary, water resources, in the government of India in 1985-87), was intended among other things to be the first step in a reorientation in sectoral thinking from an excessive preoccupation with 'major irrigation' and with large projects towards a concern with issues of resource policy and management. (This was also the intention behind the renaming of the erstwhile department of irrigation as the ministry of water resources in 1985). However, the entrenched attitudes were too strong for the kind of re-orientation that was envisaged, and the NWP itself, though it was intended to chart a new course, did not manage to shake itself free of the old ways of thinking.

In subsequent years, the growing salience of the new concerns, the gathering strength

of anti-project campaigns, and the re-discovery of value in the old traditions of water-harvesting and management, combined to make the case for a change in the approach to water planning more persuasive. This was reinforced by the wide acclaim gained by certain successful local initiatives in watershed development and social transformation. Ralegaon Siddhi, Sukhomajri, Tarun Bharat Sangh, and so on, have been written about and discussed extensively. Local water harvesting and conservation ('catching the raindrop as it falls') and watershed development have been strongly urged by many, and these ideas have begun to make headway. The Centre for Science and Environment (CSE), New Delhi, has brought out a valuable book entitled *Dying Wisdom* which gives an account of diverse traditions of local water harvesting and community-management of common resources, and makes a strong plea for the restoration of those old systems. At a national conference on water harvesting organised by CSE at Delhi on October 3-5, 1998, many instances of efforts at water harvesting and conservation in different parts of the country were presented and discussed, and four quite remarkable people who have significant achievements to their credit were honoured by the president of India.

However, there is another trend which goes counter to this. In recent years, a recurring theme in water studies is the imminent water crisis. The thesis is that with finite supplies and a growing demand (because of the growth in population, economic development, etc) the pressure on the available supplies of water will increase enormously, and that the constraint will become very severe in the next decade. Many seminars and conferences have been held on the subject, and agencies such as the World Bank and the ADB are much exercised by the grim prospects which have been put forward. The projection of a water crisis leads to the postulation of large projects as the solution.⁴

That these two approaches are divergent is not always recognised. The advocacy of small local water harvesting or watershed development schemes on the supply side, combined with demand management and economy in water use, is often received with nods of agreement, but this apparent acceptance is misleading. The inclination of most policy-makers and planners is towards large-scale, technology-driven, engineering-dominated, non-participatory projects rather than towards local, small-scale, people-centred, participatory schemes and activities. They would doubt-

less say that there is no conflict between the two and that both are necessary, but their preference is clearly for big projects. Gigantism continues to hold sway in this as in other fields. In this view water-harvesting and watershed development schemes are seen as being at best minor components of overall planning; it is felt that they cannot possibly be substitutes for large projects. The fact that cumulatively a large number of local efforts could make an enormous difference to the overall picture is rarely recognised. The whole weight of bureaucratic, engineering and political opinion is against taking these possibilities seriously and examining them.

X

Before drawing the threads of this discussion together and formulating some conclusions, a brief digression to take note of certain related matters seems necessary.

The first point is that there has been some talk of late about a 'national water policy', and this has also figured in the national agenda of the ruling coalition; but there is some confusion here. There is already a national water policy adopted by the National Water Resources Council in September 1987, and what is needed is a review and reformulation of that policy. Further, the current talk about a national water policy is in the context of an interstate dispute over river waters – the Cauvery dispute – and what is envisaged is a set of principles on water-sharing. This will *not* amount to a declaration of resource policy.

Secondly, there is a tendency to exaggerate the importance of what is known as 'participatory irrigation management' or 'irrigation management transfer'. This is a movement for the transfer of the responsibility for the distribution of irrigation water and for the operation and maintenance of irrigation systems at a certain level from the state to farmers' associations – a very desirable development and a major reform in the irrigation sector, but not an answer to all the ills of the sector, and certainly not a matter of resource policy.

A third red herring is the plea for the proper pricing of water. Pricing is indeed very important, but the whole question of resource policy and planning cannot be reduced to that of pricing. Allied to the advocacy of 'getting prices right' is the proposition that "water is an economic and social good" – a theme on which seminars and conferences are organised. Yes, indeed water is an economic and social good – if we are thinking of the use of water for irrigation or power-generation or for process or cooling purposes in

industry. But water for drinking and washing is a basic human (and animal) need, and in this context it would be wrong to describe it as a 'social or economic good': it is a basic human (and animal) right. (I am not suggesting that it should therefore be a free good.) Sustenance of aquatic and riparian life and the natural environment is also among the prime functions of water; here too it is hardly an 'economic' good. Besides, even in contexts where such a description would be right, we must be wary of bringing about the transformation of water into a commodity: that danger lurks behind the notion of water markets, though these may have a role to play within a framework of careful regulation.

XI

In the light of the foregoing discussion, what re-orientations are needed in relation to water policy? I would propose the following.

(i) *Reversing* the usual approach of proceeding from projections of demand (as if demand were autonomous and sacrosanct) to supply-side solutions, we

must proceed from limited availability to the response of demand-management and resource conservation. Such a reversal becomes even more imperative as water which is a scarce resource becomes still scarcer.

(ii) *Water-resource management* rather than *development* should become the watchword for the future. Economy in the use of this scarce and precious resource and the conservation of available supplies will have to be central to planning. (This would include increased efficiency and avoidance of waste in all uses, recycling used water, maximising utility per unit of water, and so on. It would also include the careful management of groundwater so as to maintain quality, limit extraction to the recharge capability, prevent mining except in emergencies and under controlled conditions, and avoid the incursion of salinity from the sea in coastal areas. That subject has not been gone into in this paper.)

(iii) Supply-side responses are not to be ruled out, but they need not mean only large projects. Significant augmentation is possible through local water-harvesting and water-management. *The focus should*

shift from the basin or sub-basin to the small watershed (which is also a hydrological unit). Water planning should be essentially local. The effort should be to make each locality manage its own water needs through water-harvesting and conservation schemes. The thrust in future planning in respect of water must be towards bringing about a vast network of thousands of local initiatives. (As mentioned earlier, there have been some successful instances of local water management and social transformation, but these have remained isolated examples. It is necessary to identify the factors which make for success or failure, and those which facilitate or inhibit replication.)

(iv) Traditional systems of water management which have fallen into disuse need to be revived and strengthened. This must be another 'thrust area' in future planning. Similarly, the restoration of defunct water-bodies and the rehabilitation and preservation of wetlands should be taken up as urgent tasks.

(v) Large projects, if considered necessary at all, must be regarded as projects of the last resort, to be undertaken only

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after examining all other possibilities, and after a stringent scrutiny.

(vi) In sectoral planning, whether for big projects or small, whether for resource development or management, the full participation of the people and the NGOs with a good record of social mobilisation should be ensured from the earliest stages.

(vii) Access to water has to be recognised as a basic human and animal right. The rights of the community over common resources, environmental water rights (i.e. the role of water as the sustainer of the natural environment of which it is a part and of aquatic and riparian life), and the water rights of the river (or aquifer) itself for the maintenance of its quality and integrity, also need to be recognised. At the same time, water has to be regarded as an economic and social good in the context of irrigation, industrial use, etc. Principles to govern the relative priorities of different demands and the sharing of waters by different users need to be laid down. A comprehensive water law needs to be formulated on this basis.

Such a re-orientation cannot be easily brought about. However, the effort needs to be made. It is here, and not in grandiose projects, that the answer to future needs is to be found; and here, and not elsewhere, lies the route to true 'sustainability'. The elaboration of that theme will necessitate an examination of what constitutes 'development', but that cannot be undertaken within the ambit of this paper.

Notes

[I am grateful to Himanshu Thakkar for going through the first draft of this article and providing me with some useful comments.]

1 This has been much quoted but his later doubts and cautionary remarks about such projects are not often referred to.

2 "I do not know much about gods, but I think that the river

Is a strong brown god - sullen, untamed and intractable,

Patient to some degree, at first recognised as a frontier;

Useful, untrustworthy, as a conveyor of commerce;

Then only a problem confronting the builder of bridges.

The problem once solved, the brown god is almost forgotten

By the dwellers in cities - ever, however, implacable,

Keeping his seasons and rages, destroyer, reminder

(Of what men choose to forget. Unhonoured, unappropriated

By worshippers of the machine, but waiting, watching and waiting."

- T S Eliot, *Four Quartets*

3 The disenchantment with embankments as a method of flood-control and the emergence of a strong popular movement against them tends to reinforce the anti-project movement. The

question of flood control is a complex and difficult one: it has not been dealt with in this paper.

- 4 A related theme is the likelihood of conflicts arising from the competition for scarce natural resources and the security implications of such conflicts. That debate falls outside the scope of this paper, but the interested reader is referred to my article entitled 'Scarce Natural Resources and the Language of Security' in the *Economic and Political Weekly* of May 16, 1998.

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