

WATER: UNDERSTANDING THE CRISIS

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I

The title of my talk is `Water: Understanding the Crisis'. The title as announced in the IIC Programme refers to `crises'. Perhaps the plural form is not inappropriate; I shall return to that point later.

Let me first state the connection between the topic of my lecture and the overall theme of this series of lectures, even if it seems obvious: freedom from hunger means the availability of food, food is produced by agriculture, agriculture needs irrigation, and irrigation means water. However, the phrase `freedom from hunger' must necessarily be interpreted to include `freedom from thirst' as well. Water for drinking is therefore as important as water for growing food; in fact it is even more important; drinking water must have primacy over everything else – except perhaps air. Freedom from hunger must also mean not merely the physical availability of food but also the ability of the hungry to buy the food that is available. That brings in livelihoods, whether agricultural or industrial or other; and water plays an important part in the creation of livelihoods. The availability of water is thus crucial – for drinking, for producing food, and for generating employment. Having placed my topic within the context of the overall theme of the series, I shall now confine myself to talking about water.

II

There is a widespread view that a water crisis is looming on the horizon. The National Commission on Integrated Water Resources Development Plan (NCIWRDP), in its report submitted to the Government of India in 1999, projected a difficult situation requiring urgent measures, but did not use the term 'crisis'. Dr. Y. K. Alagh has referred to this on several occasions, and pointed out that the Chairman of the Commission (Dr. S. R. Hashim) had taken a more sombre view of the future in one of his lectures. I do not propose to enter into that debate. Whatever term we choose to employ, it is clear enough that water is going to be a major area of concern for us. Some might say that a water crisis is already upon us. The World Bank talks about a 'turbulent future'. I have no quarrel with any of those formulations. Granting that there is going to be a crisis, one can still ask questions about the nature of the crisis, the causative factors and the things that we need to do to avert or mitigate the crisis. However, let me first outline the mainstream view of the crisis.

In that view, the demand for fresh water is likely to increase sharply and rapidly because of the growth of population, the pace of urbanization and the processes of economic 'development'. The pressure on the available (finite) supply, already acute, is likely to become more severe. This could lead to conflicts between different uses, user groups, areas, political units, and so on. That is a general statement often heard in both international and Indian conferences. Viewed thus, the crisis is one of availability. The answer lies in increasing the availability of water for use, i.e., in bringing more of the finite quantum of water available in nature into the 'usable' category through supply-side solutions in the form of big projects. In the World Bank's language, we need additional water infrastructure. In February 2001 the Ministry of Water Resources

declared its intention of building a further 200 BCM of storage by 2025. Later, in August 2002, the Government of India announced its massive project for the inter-linking of rivers (ILR Project).

Another answer, also favoured by the World Bank (and by ADB and some of our own economists), is water markets. The recommendation is: “define water rights, and allow trading”. There are many issues here, but in the present context, my purpose is merely to point out that this is also a supply-side answer: if the state steps back and leaves water to market forces, the expectation is that there will be a supply-side response to the growing demand, the necessary investments will take place, and so on.

Granting that there is or will be a water crisis, my understanding of the nature of the crisis is different from the mainstream one that I have just outlined. In my view, the crisis is not (or not mainly) one of availability; it is a crisis of gross mismanagement.

III

Is that kind of adverse judgment warranted?

Let me begin on a positive note. In a fairly short period of time, the production of food-grains in the country went up from around 50 million tonnes to 200 million tonnes. There were many factors involved in this, but irrigation undoubtedly played a crucial role. Many qualifications are necessary here, but we need not go into them; let us simply accept this as a success story, at least a temporary one followed by problems. Unfortunately, there is not much more to say on the positive side.

Consider the following:

- limited, intermittent, unreliable, unsafe urban water supply, and a burgeoning and thoroughly unnecessary bottled-water trade;
- failure to ensure the fundamental right of safe drinking water to all; in particular, an inadequate coverage of the poor by the public system, forcing them to buy water at high rates from private sources;
- in rural areas, the numbers of `uncovered villages' growing larger rather than smaller, despite the repeated achievement of targets; the continuing burden on women and girl children of having to bring water from distant sources;
- major and medium irrigation systems in disarray, rendering poor and unreliable service, and characterized by inequities such as denial of water to tail-end farmers;
- the vicious circle of low irrigation charges, inadequate allocations for operation and maintenance, poor service, and the consequent resistance to any increase in charges for irrigation water;
- the very limited success of `reforms' such as the Participatory Irrigation Management (PIM) or Irrigation Management Transfer (IMT);
- low efficiency of water use in irrigated agriculture, low yields, emergence of water-logging and salinity over the years;
- the persistence and intractability of inter-State river-water disputes;
- the unplanned explosion of groundwater exploitation from the 1980s onwards, leading to aquifers getting depleted and/or contaminated, and the absence of any regulation;
- rivers reduced to sewers (e.g., the Yamuna), or turned into poison (e.g., the Palar in Tamil Nadu); problems of fluoride and arsenic

- content in groundwater in some places; contamination of aquifers by industrial effluents and agricultural residues;
- mounting flood-related damages and expenditures on relief, with hardly any disaster-preparedness;
 - and so on.

That may seem to some to be a `negative' picture, but I doubt if anyone can contest the accuracy of any of those statements. The failures are manifest and undeniable.

IV

However, while there may be a measure of agreement with my thesis of mismanagement, it may be felt that this does not invalidate the projection of a crisis of availability. It is that projection that has been driving our policy and planning. We must therefore consider this further. The `crisis of availability' theory assumes that water scarcity is a natural phenomenon, that there is not enough water to meet the projected demand, and that we must somehow enhance the availability of water for use. That seems plausible, but please note that `demand' is a crucial factor here, and that this will in turn depend crucially on how we use water. `Demand' is therefore what we should look at first, and very carefully, before we even begin to think of supply-side answers.

Before proceeding further, let me make what may seem to be a semantic point. In relation to water, a basic life-support substance, the very term `demand' seems to me questionable. We can talk about the *need* for water; or about the fundamental *right* to drinking water; but `demand' seems the wrong word. This is not a quibble about words: the terminology assimilates water to the general run of consumer and

industrial goods and reduces it to a commodity subject to the market forces of supply and demand. Without entering into an elaborate discussion of that issue, let me say merely this: the usual approach prevalent in the case of consumer or industrial goods, of projecting a future demand and bringing about a supply-side response to meet that demand, will be inappropriate in the case of water; instead, reversing that approach, we must start from the fact that the availability of fresh water in nature is finite, and learn to manage our water needs within that availability.

Having made that point, I leave it aside and revert to current usage. Accepting the term `demand', my point is that demand projections need to be stringently reviewed. In every kind of water-use, major economies are desirable and possible, though undoubtedly difficult.

Taking agriculture first, the benefits of irrigation are evident, but as a water-user it has much to answer for. It is the largest user of water (around 80%); it is also an extremely inefficient user. There are three problems here. First, water-use efficiency under major/medium irrigation projects is low; it is put at around 35 to 40% by the NCIWRDP. (It is argued by some that this is fallacious thinking, as water that is lost from canals through seepage, as well as water that is applied on the field in irrigation, is partly recovered as groundwater recharge and as `return flows' further down. That half-truth is not a reason for tolerating inefficient conveyance or excessive use in irrigation. The used water may not be fully recoverable, and it may not always be recovered in usable form.) Secondly, yields in irrigated agriculture in India are quite low. Even the NCIWRDP projects a modest yield of only 4 tonnes per hectare in 2050. Substantial improvements in efficiency in water-use in agriculture (in conveyance systems, crop-water requirements, irrigation

techniques, yields) are needed, and if achieved, could sharply cut down the agricultural demand for water. The third and most important point is that supply creates demand and necessitates more supply. The availability of irrigation water leads to the adoption of water-intensive cropping patterns (e.g., paddy in Punjab where it was unknown earlier, multiple crops of paddy in the Tanjavur delta in Tamil Nadu, sugarcane in Mandya in Karnataka, sugarcane again in Maharashtra). More water is needed even to *continue* with this kind of agriculture; and of course, there is a desire to *expand* that agriculture, creating a demand for still more water, until the demand becomes unsustainable. There is always a demand for more water and still more water. So Karnataka and Tamil Nadu fight over the Cauvery, and Punjab terminates all water accords. We have to get away from this kind of competitive, unsustainable demand for water.

In rural and urban water supply, the tendency is to project future needs on the basis of per capita norms which are fairly high: 140 litres per capita per day (lpcd) in urban areas and 70 lpcd in rural areas. The NCIWRDP wants to raise these to 200 lpcd in urban areas and 150 lpcd in rural areas in the future. However, are norms of that order needed? Peter Gleick puts the basic water requirement for human needs (drinking, sanitation services, bathing, cooking and kitchen) at 50 litres per person per day (Gleick 1996). We must add a provision for cleaning the house, washing clothes, etc, but a common norm of 100 lpcd for both urban and rural areas would seem *prima facie* to be adequate. That may need further examination, but it seems unnecessary to enhance the norms. In some European cities the norms for water supply are being reduced. Be that as it may, in Delhi, the actual supply by the Delhi Jal Board is upwards of 200 lpcd, which is higher than the current norm and higher than the supply in other cities. That is of course an average

figure. The problem is that it is unevenly and inequitably distributed. There are areas where people - poor people - have to manage with 30 lpcd or less, and other areas where people - the middle classes and the rich - use 400 to 500 lpcd or more. What we need to do is to enforce economies on those (whether in rural or urban areas) that use too much water, and improve availability to groups or areas that receive too little. If this were done, it might not be necessary to raise the average. While the poor might have to be provided with a certain quantum of water at affordable prices, and the very poor might have to be given some free water, there is no reason why the middle and affluent classes should not be charged the full economic price. In fact there should be penal pricing, and perhaps even a denial of service, beyond certain levels of use.

In industrial use of water, multiple recycling and re-use needs to be insisted upon, allowing minimal make-up water: we must move towards a situation in which 90 per cent of the requirement of water for industry would be met through recycling. That might be very difficult today, but it must be our goal.

Strenuous efforts need to be made to maximize what we get out of each drop of water in every kind of water-use. Further, the amount of waste that is taking place in every use needs to be tackled: the waste must be reduced, and a part of it must be recovered for certain uses.

The Centre for Science and Environment has been repeatedly drawing our attention to the enormous quantity of fresh water that is being used for the transportation of human waste in urban areas. Are there effective alternatives to flushing toilets? If not, can we at least minimize the requirement of water for this use? CSE also points out that while our cities generate huge quantities of waste, the citizens (including the very rich) not merely pay low prices for water, but pay practically

nothing at all for the disposal of their waste. CSE refers to this as 'the political economy of defecation'.

All this needs to change, and if we do attend to all these matters, the projected water demand will not remain the same.

V

In the light of what I have said, it is clear that there are several aspects or dimensions to the water crisis. Each of the following unfortunate developments can be described as a crisis in itself:

- grossly inequitable distribution of the available water;
- the distressed state of our rivers and groundwater aquifers;
- the decline of traditional water management and conservation systems;
- the disappearance of once-numerous water bodies;
- the damage to ecological systems from the interventions in nature in the form of water resource development (WRD) projects;
- the infliction of hardship, inequity and injustice on poor, disadvantaged communities, particularly tribal ones, and on women; and
- the uncontrollable, unmanageable generation of waste of all kinds, and the consequent reduction in the availability of water.

These are not 'natural' crises, but humanly created ones. As mentioned at the outset, the plural term is perhaps appropriate; but the various crises are not independent of one another. They are inter-related and have this commonality that all of them spring from what Gandhiji would have called 'greed'. We seem to be simultaneously enlarging demand and destroying supplies.

VI

I have referred to multiple aspects, but there are also multiple *perceptions* of the crisis or crises. To the Water Establishment, as already mentioned, it is a crisis of availability. To the neo-liberal economist, the crisis is one of the failure to recognize water as an economic good and the absence of a clear delineation of property rights in water. To Vandana Shiva, the central crisis is one of the loss of control over natural resources by both civil society and the state to corporate interests, the conversion of a common pool resource and a basic need and right into a commodity governed by market forces, and the intrusion of the profit motive into an area where it has no legitimacy. To Sunita Narain it is a crisis of the criminal waste of a precious resource, and an indefensible subsidization of the rich. There is also a crisis of 'dying wisdom', i.e., the decline of traditional ways of managing natural resources. To Medha Patkar, in her anguish at the human tragedy that is being enacted in the Narmada valley, the crisis is essentially one of injustice, immiserization, and inhumanity: a sacrifice of the poor and the marginalized at the altar of what goes by the name of 'development'. In the eyes of B. D. Sharma the infringement of tribal rights and the violation of the Panchayats (Extension to Scheduled Areas) Act 1996 or PESA are grave enough matters warranting the term 'crisis'. To some others (including Rajendra Singh) the crisis may seem to be one of the relationship between state and civil society, with the state asserting its control over or even ownership of natural resources, and questioning the legality of civil society initiatives. It is also now widely accepted that the special problems of women in relation to water, and the non-recognition of the rightful place of women in water management, are matters of urgent concern. To round off that enumeration, let me add that to some the

water crisis is a part of a larger crisis of wrong ideas of `development' and a pathological relationship to nature.

The identification of certain names with certain positions is merely a matter of convenience. Each of them has a cluster of concerns and the clusters overlap; and there are many in the country who share some of the elements of those clusters. (There is of course a broad division between engineers and economists on the one hand, and the various illustrious campaigners whom I have mentioned on the other.)

Issues of corruption and the politicization of water are important, but they fall outside the purview of the present lecture.

VII

Taking all that into account, and turning my title around, we might say that there is in fact a crisis of understanding. The entire thrust in policy and planning so far has been to make more water available for use, i.e., a supply-side response to projected or imagined demand; and the thinking was primarily in engineering terms. The attention was focussed on what is referred to as `water resource development'; the manner in which water was used or managed received little attention. That orientation continues to govern thinking in the Indian Water Establishment.

I must draw your attention to an oddity here. A century ago, or even half a century ago, no one was worried about water-scarcity. The general feeling was that there was an abundance of water in nature, and that all that we had to do was to build dams wherever possible to store river-waters for human use. That feeling of an inexhaustible supply has now been lost, but paradoxically enough, the new anxiety about an

impending water crisis seems to lead to the same conclusion as before: “build more dams”, or “bring water from long distances”, and not “change our ways”.

Incidentally, a good part of the water provided for any use – domestic, municipal, agricultural, industrial - will return to plague us as waste of one kind or another. Thus, the greater the supply of water, the greater the generation of waste and the problem of its disposal. This is an additional reason – apart from scarcity – for extreme economy in water-use and the avoidance of a ready resort to supply-side projects.

The readiness with which we fall into supply-side thinking is illustrated by the persistence of the slogans ‘Ganga-Cauvery Link’ and ‘Garland Canal’ in the popular mind long after they were examined and found impractical. The new Inter-linking of Rivers Project bears testimony of the continuing appeal of those ideas. That kind of thinking is a serious impediment to good policy and planning. A non-official effort to bring the farmers of the Cauvery Basin from both Tamil Nadu and Karnataka together and promote goodwill and understanding among them as a first step towards finding a way out of the vexed riparian dispute, has been making encouraging though slow progress. The farmers of both States have realized the importance of a fair and cooperative sharing of the available waters, and economizing on water-use. The motivation for that kind of effort will be undermined if the Governments tell them that the available supplies will be increased by bringing water from another basin.

VIII

I am not taking the position that supply-side action, i.e., the augmentation of water available for use, is not needed at all. Let me say

a few words about this. There are only three ways in which water available for use can be augmented: rainwater-harvesting, groundwater drilling and large projects (for storage, i.e., dams and reservoirs, or for long-distance water transfers such as the ILR Project). Each of these would have its impacts and consequences. The impacts and consequences of large dams are by now fairly well known. In recent years, the reckless exploitation of groundwater and the consequent depletion and/or contamination of aquifers have begun to cause serious concern. Rainwater-harvesting has barely begun to be promoted, but some critics have already started cautioning against extensive recourse to this. Obviously, none of these possibilities on the supply side can be ruled out altogether; a wise and prudent combination of all three would need to be adopted. (My own recommendation, which cannot be gone into in detail here, would be to treat local, community-led augmentation as the first choice, with big dams and long-distance water transfers as projects of the last resort, to be adopted only where they are the unique option or the best of available options; and the imposition of severe restraints on the exploitation of groundwater.)

While accepting the need for some augmentation of supply, I would nevertheless suggest that the primacy that we have so far given to supply-side thinking must be shifted to the restraining of demand, the maximization of value (i.e., utility or benefit) from each unit of water, the minimization of waste, and the remedying of injustice and inequity; and that this must be accompanied by a transformation of our ways of thinking about water.

As I see it, that transformation would include an awareness and understanding of water as a scarce and precious resource to be conserved, protected and used with extreme economy; an integral part of nature; a sacred resource; a common pool resource to be managed by the

community or held as a public trust by the state; primarily a life-support substance and only secondarily anything else (economic good, social good, etc); a fundamental human and animal right; and a bounty of nature to be gratefully and reverentially received and shared with fellow humans (within the State or province or country, or beyond the borders of the country), future generations of humans, and other forms of life.

Bringing about such a transformation would of course be very difficult. It would be much easier to build a dam or drill deep for water. I can only hope that I have said enough this evening to persuade you that the easier or seemingly more realistic course is not necessarily the wiser one. That kind of thinking has brought us to the brink of disaster; persistence in it will merely hasten our passage across the brink; it will not lead us out of disaster.

Thank you.
