

# Comment

## Water development policies

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During the past five years much has been written about water development policies, both for and against, some of which warrant sober reflection by the water policymakers and some instant dismissal. A major problem stems from the fact that many people with policymaking functions in water development agencies have administrative backgrounds, and only limited knowledge and understanding of complex issues associated with water management policies. While this is not unique to water management, the problem is compounded by the fact that lack of expertise makes it difficult for some policymakers to distinguish between advice that is rational and worth listening to and irrational advice that should be ignored. Unfortunately policymakers sometimes consider seriously the opinions of those who are most vocal but not necessarily well informed.

If we review policymaking at national level some recent controversies are worth noting. I should add that as a general rule, if the water project being considered is exclusively for municipal uses – both domestic and industrial – the controversies are less significant when compared to irrigation and hydropower developments. The principal water policy issues now receiving national and international attention are outlined below.

### **Desirability of large-scale water developments**

Recently water projects have come under intense criticism from a small

group of environmentalists claiming that large dams are inevitably destructive while benefits obtained from them are minimal, and that for this reason the projects should not be authorized. The media's great fascination for 'gloom and doom' has given such opinions unmerited and uncritical publicity. Sober statements of fact from another viewpoint make for less interesting reading and do not make newspaper headlines.

It is true that water development projects have contributed to social and environmental problems in the past. Policymakers and engineers have a professional duty to ensure that these are minimized and benefits maximized, so that the latter significantly exceed the former and the final cost is socially acceptable all round. I have reviewed elsewhere in detail the social and environmental problems of water development projects.<sup>1,2</sup>

The environmental problems created by the Aswan Dam in Egypt are often mentioned. As an Advisor to the Egyptian Government, I am fully aware of what these problems are. They are real problems being discussed in the open, and steps are being taken to rectify them. What is difficult to accept are 'expert' opinions claiming that the dam has been a total disaster and should not have been built. Let us examine the facts.

The total construction cost of the dam, including subsidiary projects and electric power lines, was E£450 million. The annual return to Egypt on full operation was E£255 million – E£140 million from agricultural production, E£100 million from hydro-

<sup>1</sup>Asit K. Biswas, 'Environment and sustainable water development', Key-note Address to IVth World Congress, International Water Resources Association, Buenos Aires, 1982, published in *Water For Human Consumption: Man and His Environment*, Tycooly International Publishing, Dublin, 1982, pp 375–392.

<sup>2</sup>Asit K. Biswas, 'Environmental consequences of water development', Key-note Address, International Association for Hydraulic Research, Chiang Mai, Thailand, 1984.

power, E£10 million from flood protection and E£5 million from navigation. By any economic yardstick, it is a very high rate of return indeed to recover the cost in only two years. Furthermore, even after the construction of the Aswan Dam, the amount of arable land per person in Egypt in 1983 was 0.08 ha, which is the lowest figure for any African country. Without the Aswan, Egypt's present economy would have been a catastrophe. Thus, the real issue is not whether the Aswan Dam should have been built, since Egypt had no alternative, but what measures should have been taken to reduce subsequent social and environmental costs to a minimum.

Similarly, if some of the recent 'environmental' writings from India are to be accepted, the conclusion would be that India's water development projects have only created problems. While one should not minimize the real problems encountered,<sup>3</sup> many of the problems are pseudo-problems based on poor data and faulty analyses. The Green Revolution in India would not have occurred without irrigation development and the country could not have progressed from a largely food-deficit situation a dozen years ago to the present state of looking to export a million tons of wheat.

Water projects, like all other large development projects, contribute both positive and negative benefits. Because of *some* problems, the baby should not be thrown out with the bathwater!

### Small is beautiful

Particularly since the failure of some hastily conceived and poorly planned water development projects in Sahelian Africa, a frequent theme to arise at international fora is that Africa should develop only small-scale irrigation. On the basis of our present analysis,<sup>4</sup> there is no doubt that considerable potential exists in Africa to develop small-scale irrigation, which under appropriate site conditions has some special attractions. Such projects do not require major investment in physical infrastructures, and foreign exchange requirements, if any, are

low. Moreover, they are simpler to construct and can be developed quickly and at low cost.

Regrettably, however, there are few reliable cost estimates of small-scale irrigation in Africa. Generally those who will benefit directly provide some labour and resources, both for construction as well as for operation and maintenance. Costs currently quoted are only financial costs to the governments, beneficiary contributions being generally neglected.

The use of runoff water, bottom-land development or lifting water from shallow wells by hand or animal power in Africa costs under \$1 250 per ha. For river diversion structures with gravity flows, costs per ha range from \$2 500 to \$3 750. However, for groundwater irrigation with boreholes and pumping, the cost of small-scale village schemes (tens of ha) in Francophone West Africa is now around \$12 000–\$15 000 per ha.<sup>5</sup>

While small-scale irrigation schemes have many advantages, their disadvantages are not so generally well known. They suffer from diseconomies of scale, poor efficiency and quality control, and lack of adequate government interest and supervision due to their decentralized nature and small size. From a policy point of view, one should not approach the issue dogmatically. Small-scale and large-scale irrigation alike have important roles to play. In the area of water development projects, as in other areas, small is not always beautiful and big under the right conditions can be magnificent! Policy approaches must remain flexible, without any preconceived dogmas.

### Large-scale water developments are very expensive

Much has been written in recent years about the cost of large-scale water projects, especially those that have irrigation as a major component. There is no doubt that costs of irrigation development in Africa have been substantially higher than in the Far East, by around 64% according to estimates made by the World Food Conference in 1974. Since then costs may have risen faster in Africa than in

<sup>3</sup>Asit K. Biswas and Qu Geping, *Environmental Impact Assessment for Developing Countries*, Tycooly Publishing, Oxford, 1986.

<sup>4</sup>Asit K. Biswas, 'Irrigation in Africa', *Land Use Policy*, Vol 3, No 4, October 1986, pp 269–285.

<sup>5</sup>*Ibid.*

the Far East.<sup>6</sup> Many factors influence final costs, among them the degree of water control necessary, remoteness of the site, types of structures that need to be constructed, source and availability of materials including construction machinery, government policies (inflated exchange rates, import duties, fuel costs, etc), and the availability of skilled and unskilled labour and technical services.

It is not uncommon to find irrigation development costs in Africa at present in the range of \$15 000–\$20 000 per ha. What is often not realized is that such costs include all infrastructural development costs as well as technical and production support services costs. For example, for the Tshovane Project in Zimbabwe, with development costs of \$10 800/ha, the cost of development of the irrigation component was \$750/ha, the balance of \$10 050/ha being accounted for by items such as costs for settlement, agricultural buildings and machinery and road networks. Similarly for the Bura Project in Kenya, the irrigation component cost \$8 000/ha but unproductive infrastructure costs amounted to another \$12 000/ha, for a total development cost of \$20 000/ha.

One question that arises is whether all infrastructural costs should be accounted for under water projects when these facilities are used for other purposes as well. While a case can be made for water development to pay for a part of these costs, what percentage should be attributed to it and on what basis? Similarly, if an upland watershed had severe deforestation problems before a water development project started, who should pay for the afforestation, which may reduce soil erosion and thus reduce sedimentation in the reservoirs? Should all these costs be grouped under water development, as is often the case at present, or should only a part of such costs be apportioned to the project? These are important questions which are not being asked at present; not

surprisingly there are no clearcut answers either. Yet such questions need to be asked, debated, and finally answered satisfactorily.

### Rehabilitation or new projects

It has been argued that because of low efficiency, many existing water projects should be rehabilitated before new projects are authorized. While there is logic in such a view, one principal objective of water development projects is regional income distribution. If rehabilitation of existing projects becomes of paramount importance, it will mean people in disadvantaged areas would not have access to a new project (and thus a better quality of life) for a long time until all the existing projects are properly rehabilitated. Purely from equity and political considerations, there has to be a judicious mixture of new projects and rehabilitation. Dogmatic pursuit of one or another approach is not the most rational and practicable solution.

The issues that have been discussed above constitute four important water policy issues currently receiving increased attention. What we need is accurate, realistic and unbiased discussion of these and other similar important policy issues which would assist decision makers to make the right policy choices. The two papers on water resource development that follow in this issue of *Resources Policy* are important contributions to this dialogue. Their principal authors are Dr László Dávid of Hungary, who is at present in charge of the water programme of the United Nations Environment Programme, and Professor W.R. Derrick Sewell of the University of British Columbia, Canada. Both are well known authorities in their respective fields, whose balanced and objective analyses should be of direct interest to water professionals. Only through such discussion can we resolve the important policy questions.

<sup>6</sup>*Ibid.*