



COMMUNITY REQUIREMENTS IN THE DESIGN OF APPROPRIATE WATER SUPPLY SYSTEMS

DR ALAN REW Head of Social Assessment, Atkins Research and Development
 F R DELAUZUN Environmental Consultant, Atkins Research and Development
 Woodcote Grove, Ashley Road, Epsom, Surrey.

1. Introduction

It is sometimes worth stating the obvious. A community's satisfaction with the development project designed for it is not an optional extra. The happiness of community users depends on designs which meet social needs. Failure to meet these needs may also increase problems of resource development and management in the longer term or in other parts of the economy and society.

Countless surveys show that poorer communities put improved access to potable water high on their list of priorities, second only to, or even above, employment and livelihood. The particular and varied ways in which these needs are linked to other needs and to wider socio-economic and political constraints are of the utmost consequence for the communities themselves. The detail of their requirements is often lost sight of. It can be argued, even, that senior government officers and national politicians should attach little importance to the detailed requirements of small-scale communities: they ought to be concerned with broader policy questions, planning targets and setting standards at sector level. This view implies an artificial distinction between 'planning' and 'implementation' in terms of timing, hierarchy and personnel. This paper starts from a different assumption: it is that consumers and users of water supplies in the poorer countries of the Third World are concerned with the actual outcomes of the allocation of natural and human resources available for water supply rather than with planning intentions however rational.

The UN water decade has attracted considerable attention through its aim to supply 'clean water and adequate sanitation for all by 1990'. The implementation of such a goal suggests a breakdown into planning components: particular targets to identify who needs water; who needs sanitation; in which countries, in which sectors of each country; budgetary implications; natural and human resources available; and a commitment and ability to manage the relationship between specific targets and resources. This approach is eminently rational within its own terms: it sets aims, breaks these aims down into subsidiary targets and relates the achievement of these targets to the availability of finance, manpower and management skills.

It is when one examines, from the grass-roots level, the actual outcomes of this approach that one finds that the formal aspects of a planning rationality have been preserved at the cost of the substance of rationality. Against this, we would also emphasise that an approach which only records a grass-roots perspective and ignores the institutional framework, engineering and financial constraints and opportunities is equally distorted.

There is a third option. It relies on an integrated technical, social, and financial assessment of the process in which water supplies are allocated, both by market and non-market means, and the ways in which these can be realistically improved. The need for this third option of an integrated social and technical planning of water resources is shown in the following paragraphs.

2. Reasonable access can be unreasonable

The UN water decade attempts to ensure reasonable access to potable water supplies for everyone. Many governments will also wish to ensure, for populist reasons, broad equality in access to water holes, particularly in the arid lands of the Middle East and North Africa.

A regular supply of water brings about significant changes in the way of life of the Bedouin (Marx 1978:48). As more permanent settlement and increasing numbers of livestock use the water hole, there is an irreversible impact on the pastures which support the livestock on which the tribesmen are dependent. There are significant impacts on livestock populations, the environmental patrimony, on agricultural strategies and even on the populations themselves since many Bedouin groups have households associated with them in a client capacity. It is these clients who are the people first expelled when water resources are under pressure. The key point here is that unless the overall relationship between environment, agriculture and rural society is taken firmly into account in analysing the way people use their environment, then the result is desertification and population movement.

The inter-relationship of rural water supplies with agriculture and other aspects of the rural society and economy is illustrated by

our study of a commercial project in Papua New Guinea. Villagers were so concerned to secure the supposed benefits of a large scale, commercial agricultural project that they were prepared to seriously understate the dangers of contamination to their springs and streams from intensive livestock usage. They were worried that if they created difficulties over water supply that the project would pass them by (Rew 1980). The social response in water planning needs careful analysis.

3. Physical and Social Scarcity

Another aim of the UN water decade is to improve the quality of water supplied. There is obvious scepticism in the Third World about the attempt to supply minimum services - as if these societies were not worth full scale services.

Accordingly, when there are changes to improve the quality of water and its supply, countries usually insist on reticulated systems operating at very high standards relative to the systems they are replacing. The results from installing such a system can be quite dramatic. For example, in Algeria, there are marked differences between those households with access to individual reticulated water connections and those houses with only access to public standpipes. In the case of Algeria, according to 1973 WHO figures, the consumption from standpipes is from less than one-half to only one-sixth of that from private water supplies. (1)

The implications of these figures are apparent. We so often think of scarcity as a feature of the natural resource endowment. Scarcity is thought of as a physical concept. A great deal of economic analysis is built upon Malthusian premises: population pressures, it is thought, build up against limited natural resources with scarcity as a result. The material we have examined suggests that scarcity also should be seen in a social framework: within rather wide physical parameters the experience and maintenance of scarcity is essentially social and institutional. If some individuals and groups have the ability to consume more of a resource while others are forced to consume less because of the way in which it is distributed, then we can speak of a social scarcity. The privileged conditions and quality of supply for some leads to their dramatically increased consumption over others. The limited endowment of natural resources (physical scarcity) is made pressing and urgent because of the underlying relations of social scarcity established. Water conservation schemes must take this social process into account and design appropriate institutional, technical and financial controls into the supply system.

4. Water Bureaucracies and achievement

Another danger in attempting to meet the target of water for all by 1990 is that over-achievement in trying to reach targets may create its own disasters. The headlines

which the UN water decade will create may stimulate certain officials and agencies to press their claims for government finance and resources.

The result may be that aims are set unrealistically high by evangelistic officials. Excessive claims may be made on government resources without sufficient regard for the absorptive capacity of the country. There is another aspect which is worrying. The attempt to over-achieve is likely to lead to highly publicised pilot projects which benefit some to a very high standard as well as showing high standards of engineering. But these pilot projects are likely to make other people relatively deprived and create expectations which cannot be met. Moreover, the publicisation and implementation of these pilot projects will provide a legitimacy for communities trying to achieve the goals of the programme in their own ways. Expectations are high and lacking other means, ad hoc self-help efforts will proliferate.

Our research has shown that a network of illegal water connections then develops as does the uncontrolled exploitation of ground water resources with often serious consequences for the quality of underground water and aquifers (Rew 1978). Lack of social control thus threatens the physical resources themselves and leads to unplanned development. A substantial number of unauthorised connections together with unrealistically high expectations leads to the sabotage of meters and supply lines which then threatens the financial viability of even the controlled pilot part of the programme itself (Rew 1979).

There is a further danger. It is that these kinds of developments create almost irreversible ratchet effects in the society. There is no way of making people accept standpipes or other low-cost options when they see the groups which they emulate with regular access to high quality supplies. This effect is reinforced where institutional and social factors mean that there is scope for solving water supply difficulties by independent community action. Because of the social response factor, monitoring and evaluation of water supply projects should assess the distribution of water benefits in the population and the inter-penetration of social, financial and technical factors in design, operation and maintenance.

5. Urban programmes for rural contexts

In planning water supply it is easier to set targets and implement projects for urban populations. Density has something to do with this but only in part. The real differences between urban and rural schemes lie in the way in which home and work are connected in urban settlements and the greater variability in the way in which households are related to the division of labour in rural areas.

Reasonable access to water is a goal for the UN water decade. In order to specify this goal for urban areas one workshop recommended that a minimum target is for a water source within

200 metres of each house. Urban settlement is variable but it is variable within a range: a single minimum standard is therefore feasible. Furthermore, the separation between most household and employment activities is such that the water planner can assess demand for industrial, commercial and public usage almost independently of domestic use. Using aggregated demand and known minimum standards the planner can then proceed on a 'count, cost and carry' basis. He counts demand, costs various ways of satisfying this demand and having decided on a particular technical and financial option then carries it to the population concerned.

This is just not possible in the rural areas. The contextual nature of rural life is incompatible with the idea of universal standards. The range of settlement types is considerable, and the complex inter-relationship of domestic, agricultural and non-agricultural activities means that needs for human consumption, for irrigation and for livestock are all intermingled in different ways within each context. Moreover, the data base for estimating the scale of the problem and the precise nature of interconnections is very often unavailable. The workshop referred to above was unable to recommend anything as specific for rural contexts as it did for urban schemes.

As Donaldson (1976:5) emphasises, water supply in this sector in particular 'is more administrative than technical in nature... all action (technical, administrative and financial) must be coordinated at the central level - without forgetting each project also needs strong local participation'. The attempt to develop and manage coordinated water-supply systems using strong local participation and institutional controls is not an easy one. Certainly, minimum water for all will not be achieved by unaided self-help. National programmes often call for various kinds of self-help and reference is made to supposedly traditional values - for example, to the spirit of bayanihan in the Philippines or to gotong royong in Indonesia. But these self-help values will not thrive without the appropriate institutional, technical and financial support. This would mean placing greater emphasis on technical assistance for officials at intermediate level and a decentralization of the planning process. Certain countries - for example, Botswana, Mexico and Indonesia - try to put the responsibility for detailed allocation of resources as low down the hierarchic scale of administration as possible, leaving to the community the precise choice of how the resources should be used while prescribing the broad limits within which programmes had to remain. This strategy has considerable implications for systems of statistical reporting and accounting and for the balance between recurrent and initial costs.

6. Water supply as a social fact

Water supply, as we have seen, is more than a

question of biological quality and engineering delivery. The social response to design determines the actual outcomes and community satisfaction. Aesthetics, social inequalities, conceptions of disease, dependence, labour and employment issues are all involved.

We should be aware of the many 'after-the-event' social impacts of increasing access to water. Improved access to water through improved water supplies has been noted to make life tougher for the women who, within the traditional division of labour, are responsible for carrying water. With secure supplies of water near at hand, women have greater time available and therefore receive less help from other household members than previously. (Elmendorf and Buckles, 1980). Improved access may also cut down the time available for women to socialise, to increase control over them and encourage disease through stagnant water.

If supplies are brought close to clusters of households the effect may also be to increase rural inequalities because of the way in which better-off households congregate nearer to the roads. 'To even see the houses of the poor one often has to leave the road' is the comment of one recent study of three villages in the low country of Sri Lanka. Another result may be that within a large scale rural supply programme water may be routed through territories and villages about which people feel considerable scepticism and fear. Any reading of African sociology, for example, shows the enormous fears associated with witchcraft and sorcery. (See for example, the anthropological novel written by Eleanor Bowen and the relationship between choice of settlement and fears of witchcraft). Many riparian rights in rural areas are non-codified but are nonetheless of such a standing that they are equivalent to legal rights. Rural water supply projects which fail to take these rights into account will increase rural tensions.

There are also impacts on employment worth considering. Experience in the southern Philippines shows that municipal water supplies can be used to provide the basic resource for a thriving private sector water supply industry: urban water is tanked into outlying areas. The introduction of piped water supplies into the rural areas should lead to a fall in the price of water for rural consumers since carrying water is expensive. On the other hand such improvements affect levels of employment since rural people will tend to be employed as the drivers and carriers. Dunn reports an interesting case of where donkey drivers, deprived of employment as water carriers by a new scheme, vandalised the new well. The solution was to employ them as guardians of the well to recompense them for the employment they had lost.

The attempt to develop standardised 'community' programmes may well affect the

ability of particular households to solve their own problems and to gain their own optimum solutions. In one Pacific island not noted for its agricultural productivity, the government had funded the provision of community water tanks made with cement and chicken wire. These were delivered to central village locations. The effect was to make it harder to buy the galvanised tanks which they were to replace. Indeed this was one of the aims of the project since there had been many maintenance problems with the galvanised tanks. The effect on rural labour was considerable. People now had to walk to get their water rather than collect it from their own roofs. In a local agricultural economy in which the key constraint on production was the relatively low price-responsiveness of farmers this community improvement created many social costs.

Finally, the 'aesthetic' aspects of water should not be ignored. In one Pacific island we were told that there was a strong preference for rainwater collected from the roofs. This was 'sweet water' compared to the hard water collected from underground sources and piped to consumers. Since people will prefer to use sweet water for drinking purposes then standards for purity should apply to this and be adjusted to local circumstances rather than to the reticulated water system. Elliott (1975) summarises the issue neatly: 'Purity is a relative concept depending on the uses to which water is put, the density of the ambient population, the number of people using the particular water outlet, the drainage available and the health environment... the health hazards associated with a given level of purity may be very different in each environment. Standards are very seldom established locally'.

Conclusion

The UN water decade has laudable aims to help meet an important need acknowledged by poorer people throughout the world. We see the possibility, however, of danger in the way these aims will be translated into action. In the paper we have shown how an over-emphasis on any one aspect of a total system of water service supply can lead to unfortunate results when judged in terms of happiness of the people affected. Our conclusion is that the aims of the UN water decade should be implemented through integrated water resource management projects responsive to the needs of particular regions, countries and communities. If this is not done the result may be an irreversible situation where the implementation of aims may be considerably delayed. Impatient for results, many people will feel, however, that it is important to keep specific recognisable targets before the eyes of engineers, politicians, etc. We have shown that this approach can produce a patchwork of over-achievement and inaction with irreversible ratchet effects on people's aspirations. These aspirations prove unrealistic since the aims in the headlines are achieved unevenly. An integrated social, technical and financial

appraisal based on regional resources could avoid many of these problems.

Footnotes:

(1) Contemporary figures will be available shortly from Binnie and Partners and W.S. Atkins and Partners combined study of Algiers water supply. Initial print-outs tend to match the range of unit consumption figures for houaw connections given in the 1973 WHO figures.

Bibliography

- Donaldson, David. 1976
Rural Water Supplying Latin America: organisational and financial aspects
Les Carnets de l'Enfance 34 UNICEF
- Elmendorf, Mary and Patricia Buckles. 1980
Socio-cultural Aspects of Water Supply and Excreta Disposal. Vol 5. Appropriate Technology for Water Supply and Sanitation
World Bank.
- Marx, Emmanuel. 1978
The Ecology and Politics of Nomadic Pastoralists in the Middle East in W. Weissleder (ed) The Nomadic Alternative
Mouton, The Hague.
- Rew, Alan, 1978
Urban Water: Access, Delivery and Institutional Scarcity IDS Discussion Paper 113
Institute of Development Studies, Sussex.
- 1979
Misere urbaine et dependance a l'egard de l'eau
Les Carnets de l'Enfance 45/46 UNICEF
- 1980
A Ranch for Cape Vogel: failure and promise in regional development. Chap. 3,
Monograph 14, Institute of Applied Social and Economic Research, Papua New Guinea.