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Water, sanitation and money

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THE PROBLEM

1. The provision of infrastructure in developing urban areas has, for too long, been dominated by excessively high standards. It is reluctantly being recognised that government funds, and the economy in general, cannot afford to sustain such high levels of service, and that change must take place, however politically difficult that might be.

THE CHALLENGE

2. The United Nations declared the 1980s to be the International Drinking Water Supply and Sanitation Decade with the high ideal that every nation should strive to provide every family with access to clean water and hygienic excreta disposal. The Water Decade taught us that if one attempted (as we did in Lesotho and elsewhere in Africa) to calculate how much it would cost to serve the entire population, to existing standards, the result was simply terrifying. The cost was too great. There was an obvious need for a fresh look, a more critical look: to determine what is an adequate, acceptable, affordable level of service. Some developing countries have readily accepted the need for more realistic service levels, while others, especially those with a prosperous history, have found it difficult to adjust, and are still struggling with these issues today.

3. In most parts of Africa, including South Africa, the needs are enormous, there are limited funds, skills are in short supply and operations and maintenance a continual headache. It is not appropriate to set an artificially high standard of service for the lucky few and then ignore the majority who "just cannot be helped". Nor is it appropriate to see the provision of services solely as a Government function: built with the aid of subsidies and maintained with the aid of further subsidies. The provision of water supplies and sanitation must be a replicable activity. If subsidies are unavoidable, they must be carefully targeted and sustainable.

4. For too long policy makers, and the engineers who advise them, have worked with a narrow understanding of what constitutes "proper standards" and built inappropriate unaffordable water supply and sewerage schemes with scant concern for their financial and economic context. Simply resorting to subsidies does not solve any problems; if allowed to proliferate, they sow the seeds of bankruptcy.

THE FINANCIAL CONTEXT

5. In a well organised municipality the City Engineer probably knows what is going on: he knows how much it costs to run the water supply and sewerage systems, and how much it would cost to extend them. He knows what the gap is between what is treated and what is sold, and how to go about raising tariffs to cover the difference. He knows how much capital expenditure the council will allow him and how to justify borrowing and repaying more. On the basis of all this he can give a relatively simple brief to a consultant: "design some of this and so much of that". However, in a large number of developing countries, including parts of South Africa, virtually none of the above information is readily available. It is desirable that this information be established before the design brief is finalised. It therefore follows from this that before technical decisions are made during the feasibility study, the financial context must be clearly understood.

6. The financial context includes the following: Who will pay the capital cost (e.g. government, local authority or householders)? Who will pay running costs? What is the financial performance of the existing systems (if any)? Is water consumption metered? Are present charges collected? Are there any policies/precedents on subsidies (both capital and recurrent)? What could the local community afford to pay? Is the local authority constrained, by legislation or politics, from raising tariffs?

7. It should be obvious that answers to the above questions could make quite a difference in the conception and design of water and sanitation schemes, e.g. high capital/low maintenance versus low capital/high maintenance; alternatively high cost/high user convenience versus lower cost/lowered convenience.

THE ECONOMIC CONTEXT

8. Many people use the words "financial" and "economic" as if they are interchangeable. But the term economic is wider than simply referring to money. It is better understood as dealing with, say, the management of the resources of a community, and the means of production and distribution of wealth. At a macro level we can talk of the health of the national economy. Much has been said about the declining economies of

Africa but some people still look back on former prosperity, albeit for a minority, which has produced a taste for the unsustainable high service levels mentioned earlier. At a micro level we can ask questions like: is this community wealthy enough to support the services we are tempted to provide? If not, who will do it?

9. The economic context of proposed investments in water supply and sanitation could include the following: sources of wealth, income and jobs, the potential for growth, sophistication in the workforce and commercial and industrial sectors, the presence of local entrepreneurs, the scope for privatisation, the need to use local resources and create jobs through the use of small contractors and labour intensive techniques. And what would be the costs and benefits (financial and non-financial) of the proposed investment?

ON CAPITAL COSTS

10. The cost of developing land for housing is of great concern to both central and local government and is the subject of much study by planners and engineers. Water supply and sanitation are key infrastructure items, having a marked effect on the quality of life in any housing development. In South Africa, capital costs per plot, for both services, range from R1 500 (US\$550) for a shared public standpost supply and a VIP latrine to R4 000 (US\$1 500) for individual water and sewer connections (1990 prices). These costs represent on-site (neighbourhood reticulation) costs which are potentially recoverable through the sale of plots.

11. Concerning the on-site costs, we see two large steps in the cost figures as user convenience increases: first when water is brought onto the plot and second, when a sewer connection is made. Needless to say, there is a massive difference in overall costs between non-sewered services and those catering for full sewerage. Can our clients afford the more expensive options? How would they be paid for? I believe that serviced sites should be sold according to the cost of providing those services and a range of levels of service should be offered. If this approach is followed, prospective buyers will make rational decisions about what level of service they are willing to pay for and capital costs will be recovered and re-used to service more sites, thus making the process replicable without further external funding.

12. Further capital is required to meet bulk infrastructure costs ranging from R300 (US\$110) for the lowest option, up to R2 500 (US\$900) per plot for full water and sewerage (KLEM, 1990). This expenditure is normally recovered through tariffs, if at all. In general, the failure to recover the capital costs of bulk water supply and

sewerage works through tariffs has led to serious under-financing of the sector throughout Africa. There is a strong case for basing tariffs on the full marginal cost of supply and treatment (ANDERSON, 1989). This is reinforced by World Bank figures derived from 15 years' lending experience in the sector. From the many water supply institutions supported by the Bank, they found that the average effective (sale) price of water was only about a third of the average incremental cost of produced water (WORLD BANK, 1990).

13. Rough estimates have recently been made of the capital sums required to provide water and sanitation to all the inhabitants of South Africa (including the TBVC regions). They draw attention to the care required when preparing a national policy. It has been estimated that to serve everyone to existing standards (where such policies exist) would need about R22 billion (US\$8 billion) (WS2000, 1991). Using more realistic standards, this could be reduced to R14 billion (US\$5 billion). This is still a large amount which could not be treated purely as grant finance but would need sound cost recovery policies in place.

ON RUNNING COSTS

14. Water supply and sanitation services usually demonstrate a high correlation between user convenience and running costs. Unfortunately, the authorities responsible for developing urban areas frequently neglect to fix tariffs sufficient to meet the full extent of these running costs (not to mention repayment of capital). This may not be their fault if, for instance Central Government has pressured them to keep prices down as a "social service". But in the end everyone suffers: income does not meet operations and maintenance costs and the quality of the service deteriorates. A basic principle should be: the user pays; and the more he uses, the more he pays, wherever possible. I am aware that the use of water meters is both problematical and expensive in itself, but there is a strong case for privatising meter reading and maintenance and for having the political will to disconnect non-payers.

15. "During the past decade there has been a growing, but still inadequate, recognition that appropriate user charges and pricing levels have not only a financial role but also a powerful influence on the sustainability of services and on the operational efficiency of service institutions. Increased reliance on user charges to pay the costs of services has a tendency to reinforce the choice of levels of service for which people are willing to pay. In addition, user charges can contribute to improved performance by creating incentives to supply institutions to be more responsive to user concerns about service quality and reliability" (WORLD BANK, 1990).

16. The continued provision of free water at public standpipes is under intense scrutiny. It can pose an enormous burden on a supply authority or local government. There is little incentive to avoid waste, and free water is often abused, to the detriment of others who perhaps cannot receive water at the far end of the line. Selling purified water encourages people to value it and acknowledge that it is not "a free good". Vending systems have their problems but they also serve a purpose at the edge of formal development.

17. A common problem resulting from past policies has been the settling of people on fully serviced sites irrespective of their income. It is important to avoid this in future because it is possible (or probable) that many households would not be able to meet the water and sewerage tariffs when they are set for full cost recovery. A case in point is the new housing subsidy scheme recently introduced in South Africa (see paragraph 21). The scheme originally envisaged a minimum service level of full waterborne sewerage, even for very low income beneficiaries. However, low income households may be unable to afford the full tariffs for water supply and sewerage – which could lead to political pressure to subsidise running costs. The need for a more flexible approach to service levels has been recognised in order to preserve the principle of full payment of service charges.

ON SUBSIDIES

18. Water supply and sanitation are political issues throughout the world. Everybody wants them and everyone tries to persuade "government" that it has an obligation to provide them, preferably free of charge. The common result is a heavily subsidised service limited in extent by a shortage of resources. Just as common in developing countries is the result that the relatively well-off elite benefits most from the subsidies!

19. As mentioned before, misdirected or misplaced subsidies produce harmful distortions e.g. water wastage, political pressure to resist raising tariffs, poor maintenance and inequitable distribution of infrastructure. "The scope for increased subsidization of the sector is limited in most countries and increased subsidy levels would further reduce incentives for sector institutions to perform efficiently" (WORLD BANK, 1990). Subsidies on running costs really must be avoided. Subsidies on capital costs should be carefully structured or targeted to meet agreed objectives: e.g. public health requirements, help to the very poor, or avoiding the expansion of an inappropriate system. They should also be confined to a basic minimum; any improvements aimed at increased convenience should be cost recoverable.

20. In South Africa it must be acknowledged that there are many justifications for a wide range of subsidies affecting the poor, but there are many which have outlasted their usefulness. There is still a case for short-term subventions to "redress historical and geo-political inequities" but our long term aim should be to reduce subsidies to an absolute minimum, with specific objectives. In the meantime we need a rational framework for the phasing out of those which, in the not-too-distant future, will no longer be needed.

21. Wherever possible, subsidies should be confined to one-off contributions to capital costs. This is the guiding principle for the new South African housing subsidy scheme introduced via the Independent Development Trust. The scheme aims to provide low income urban households with a serviced site (water, sanitation, roads and streetlights). The maximum subsidy per site is presently set at R7 500 (US\$2 800). The demand is enormous, but it has been calculated that this subsidy is sustainable if all other housing subsidies (e.g. interest subsidies to first-time home buyers) are phased out. This calculation also presupposes that all service charges (running costs) are met in full by each household.

TECHNOLOGY CHOICE

22. There is much written about technology choice in water supply and sanitation. A good summary would be: "An appropriate technology is one that has been chosen within the full context of the environment in which it is to be placed" (JACKSON, 1986). I do not propose to comment on the technologies available for the treatment of urban water supplies. The choice of technology for distribution is rarely an issue, attention is better focused on the most appropriate levels of service which, in turn, will be influenced by consumers' ability to pay and the best method of achieving cost recovery. There is, of course, a link with the type of sanitation chosen and, as mentioned previously, this can have a marked effect on both capital and running costs.

23. The following are a few conclusions, concerning sanitation, based on recent experience in South Africa. "There are very few circumstances in which a VIP latrine cannot be installed and bring immediate improvements to a family's quality of life. Threats to groundwater are frequently overrated and opposition to VIP latrines is largely the result of muddled thinking". "The only upgrading of a VIP latrine, that a household would be willing to pay for, is to replace it with an in-house toilet" (JACKSON, 1989). While there is an apparently wide range of sanitation options to choose from, we have come to the point where the options for Southern Africa can now be limited to a few. The vast majority of sanitation needs

can be met by a mix of the following: a) VIP latrine (single or double vault) accompanied by a sullage soakaway, or b) Septic Tank and Soakaway (preferably with a low-volume flush toilet and with an optional addition of an evapo-transpiration bed) for isolated upgrading of mixed income areas or c) Full Waterborne Sewerage (limited by affordability).

PROJECT DESIGN

24. In some countries, local authorities and consulting engineers have difficulty thinking of different technologies and levels of service. I recently read an investigation report which, in effect, described what the engineer would have liked to design and then spent 20 pages justifying a drop in standards (under pressure from the Development Bank). I submit that this was approaching the problem in the wrong way: we should start with the "do-nothing-scenario" and then try and justify each possible investment in improvements.

25. In the past, water supply and sanitation project have frequently been designed on the basis of a very limited investigation looking at a very limited range of options. As resources become more scarce, and the needs increase rapidly, we need to be more careful in stretching those resources as far as possible. It is necessary to spend much more time and money on the initial investigation and feasibility of a project than was common in the past. I believe that a more informed, rigorous approach at this stage will produce the best end result, and may save substantial sums in the long run, both in capital and running costs.

26. I propose that investigations into water supply and sanitation projects should proceed along the following lines. Three fundamental questions must be answered right at the beginning: 1) Why has an investment/improvement been requested? 2) What is the performance (strengths and weakness) of the present system (if any)? 3) What improvements would the client community be willing to pay for? This last question depends heavily on the financial context mentioned earlier – who pays for what? These questions should form the basis of a phased investigation, with milestones requiring consultation, and with options to stop or proceed in a new direction at each milestone. **There is no point in dealing with details of engineering design while the financial issues remain unresolved.**

27. I referred earlier to the well-organised City Engineer who knows what is going on and how to marshal his resources to achieve maximum effect. In the developing areas of Southern Africa, clients frequently rely on consultants to help them make the right investment decision, and I believe they are frequently let down. We

need to take a more holistic approach to proposed investments. Consultants cannot confine their attention to engineering technicalities. They must be able to call on financial and economic expertise to inform their investment decisions each step of the way. Only then will clients be getting a truly professional service.

B M JACKSON, Johannesburg, May 1991.

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