Contributing Paper

On Community Based Systems

Jon Lane
Independent Expert, UK

Prepared for Thematic Review IV.3:
Assessment of Water Supply Options

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World Commission on Dams

Jon Lane's contribution to Thematic Review paper IV.3: Assessment of Water Supply Options

Final version JL 10.11.99

This document contains text fragments, boxes and comments [in square brackets], intended for editing and/or including in the actual Paper IV.3 for which W.S.Atkins is the lead author. Each text fragment, box and comment is placed under the appropriate heading (taken from W.S.Atkins's Revised Draft Outline of October 1999).

Section 2 The nature of the debate and purpose of this review, first sub-heading:

- [The first bullet point is reasonably covered in Vision 21. I suggest correlating the advocacy of water as a social good and/or basic right with the appreciation that users themselves are ready to take responsibility for managing their services. The "water as an economic good" theme is still controversial, with some people (e.g. many at World Bank) taking a hard line of purist market forces economics, others insisting that this is subjugated to the social good: this is an unresolved debate. One other point: I note that the first bullet point as drafted only refers to water. I suggest we need a similar summary of the debate on sanitation, because large-scale waterborne sewerage would have a huge effect on the demand for dams. In brief, all the talk is now of waterless or low-water sanitation, although there is only limited experience of this in cities of developing countries. I suggest we mention that there are not yet many examples of large-scale community-managed sanitation, and they (e.g. Orangi Pilot Project) conveniently end with the local sewers discharging into municipal trunk sewers that already exist. Who will build that primary infrastructure in places that currently lack it? Perhaps nobody will.]

- [For the second bullet point, here is some text:] The Water for People Vision Paper (Vision 21) is being written by the Water Supply and Collaborative Council both as a document to stand alone and as one component of the World Water Council's Vision. It deals only with provision of drinking water and sanitation services to those (predominantly poor) people in developing countries who currently lack them. Thus it is more limited in its scope than, say, the World Water Council's Vision or the WCD's thematic reviews.

  Vision 21 is a message from the water sector professionals to decision-makers and politicians around the world. It sets time-related targets for water and sanitation for all, and describes how those targets can be reached using ideas and methods that are already known.

  Its most important themes are:

  - to place water and sanitation in the context of human development and of human rights, which in turn implies the important role of the people themselves in managing every aspect of water and sanitation services;

  - to stress the importance of setting targets and goals (and to introduce the Basic Water, Sanitation and Hygiene Requirement as an indicator, potentially leading to a Human Water Index);

  - to advocate the integration of sanitation and hygiene education with water supply, pointing out how far sanitation coverage currently lags behind water coverage;

- to point out that universal water and sanitation services are affordable from current levels of finance, mainly by recovering both capital and running costs for water and sanitation services for richer people (and running costs only from poorer people);

- to emphasise the need for all types of organisations and people to collaborate together better in order to achieve the common goals;

- to draw attention to urban water and sanitation needs in the decades ahead, which will be both numerically larger and more complex to solve than rural needs.

Vision 21 scarcely mentions integrated water resources management or water storage requirements. Its premise is that domestic consumption must be given first priority on water use but only needs a small percentage of available supplies, and hence overall water shortages are unlikely to be critical to the task of providing water and sanitation to all.

This premise may be somewhat idealistic. It is, however, reasonable to say that the attainment of Vision 21's goal will generate little extra global requirement for water, according to the following logic. Those people in developing countries currently classified as "unserved" generally use approximately 10-15 litres of water per person per day (lcd), while this figure falls to 5 lcd only in very poor slums or very arid regions with small populations. The basic service level envisaged in Vision 21 is approximately 40 lcd. So the extra domestic water needed by the year 2025 is approximately 30 lcd for 3.4 billion people (1.4 billion currently unserved plus 2 billion population growth), which amounts to less than 40 cubic kilometres per year. This is insignificant compared to the 4000 cubic kilometres per year currently withdrawn globally. The significant demand will arise from the water needed to grow the food for those 2 billion new people, not from their domestic consumption.

Disaggregating those global figures down to local water requirements, the critical locations will be the growing cities of the developing countries. The majority of these will be in South and South-East Asia. Individual cities will create significant requirements for water storage, but generalisations are of little use in discussing this. Each city will require its own analysis of water requirements, and the politicians and decision-makers in that country or region will have to decide allocations case by case.

Regarding sanitation, Vision 21 advocates on-site low-water usage sanitation services as the only viable means to serve the much larger numbers of people who lack sanitation (currently approximately 3 billion unserved plus 2 billion population growth by 2025). This approach is advocated principally for financial reasons, that conventional waterborne sewerage is simply too expensive for the growing cities of the developing countries. It also has the important consequence that sanitation will not impose significant extra burdens on water resources. The more serious problem will come from pollution of existing water sources by the industrial and domestic effluents associated with the extra population.

- [For the third bullet point, here are some changes over the past few years that could be included:]

The atmosphere in the sector is less optimistic than it was ten years ago, but still positive and determined to achieve bold goals of universal service.

People in the sector now understand that the main obstacle is lack of political will, and therefore that they must talk to politicians and decision-makers. Vision 21 is an example of this, and intends to be markedly different from the status quo in which the water sector professionals prefer just to talk among themselves.

External agencies are beginning to understand that water users (even the poorest people) can be active agents of their own development rather than passive recipients of others' actions. Thus community management is increasingly understood and followed, though the breakthrough from small-scale (typically NGO) projects to national scale is slow.

Water sector professionals are beginning to understand the sheer size of the future urban problem. External agencies are shifting some resources from rural to urban areas.

Many people in the sector are talking more about sanitation (but we do not yet see the evidence that they are actually doing much more of it).

Developing country governments have come under great pressure from the IMF and World Bank on structural adjustments of their economies, which have generally resulted in less money being available for the water and sanitation sector.

- [The fourth bullet point is also reasonably covered in Vision 21. It uses phrases such as "planning" and "managing projects" rather than "evaluating alternatives" but it means much the same.]

Section 3.1 Current Strategies, second bullet point:

The range of supply strategies proposed for those currently without access includes the following:

In rural areas the vast majority of new (and future) supplies rely on ground water, mainly extracted by tubewells or hand-dug wells. The volumes of water involved are so small they make minimal impact on the groundwater regime. They have no consequences for storage. In hilly areas, springs are tapped but without storage and with slight effects on local farming practices only.

In small towns (increasingly becoming recognised as a classification distinct from the big cities to which the term "urban" is usually applied) the current strategy favours simple piped reticulation systems served preferably from boreholes or alternatively from river intakes. The latter would have some effect on other users and might involve some seasonal storage. These formal supplies are frequently supplemented by the people themselves from various local sources, but with minimal consequences for storage.

In urban areas there are two main strategies for unserved people: discrete sources or extensions of existing supplies. Many communities favour having their own discrete source of water, because it lessens their dependence on others and hence the vulnerability of their supply. Discrete sources would generally use groundwater via boreholes or tubewells, with minimal consequences for storage as in the rural case. Extensions of existing piped networks into unserved areas require either extra water at the source, with obvious potential storage requirements, or reduced system losses. (It should be noted that many system 'losses' are in fact illegal connections by the nominally unserved people themselves, so that replacing these with properly planned and constructed connections may give better service without much extra overall demand for water.)

Section 3.2 Alternative and indigenous technologies:

- [On the first bullet point:] The Global Water Partnership is the best source of information on integrated water conservation strategies at the river basin scale or larger, since this is why it was established.

At a smaller scale, NGOs (either local NGOs or international ones such as CARE International) have been implementing community-managed integrated watershed management and water resource management projects for years. Many have been successful at improving water management while providing domestic water supply and agricultural employment. These projects are to be encouraged. If this approach were more widely adopted, it could have significant impact on water conservation overall, reducing the future need for large-scale irrigation and water management schemes.

The main disadvantage of integrated, community-managed projects is that they are labour-intensive, requiring project staff of different professional disciplines to work together and with the communities over some years. This makes them difficult to scale up because while governments often have plenty of under-employed field staff, they usually lack transport, per diem budgets etc. So the governments are dependent on external support to fund such projects.

Another difficulty is that community-management structures work best within a relatively small geographical area. The river basin is usually regarded by external agencies as the ideal water resources planning unit, but it is too large for effective community management.

- [On the second bullet point: I understand that Jeremy Bird has commissioned another specialist author to cover rainwater harvesting, so I will not duplicate. Here are just a few brief points:]

  Rainwater harvesting is undergoing a revival currently, as external agencies become more interested in alternative supplies. It has the advantage of capturing water at the beginning of the hydrological cycle, which is inherently an efficient concept, and of providing that water at or near the homes of the users. The technology is also well-established, simple and durable: some Roman systems are said to be still in use after two thousand years, and many rocky islands around the world routinely obtain all or most of their water supplies from rain. Household or community management is possible, since most rainwater structures are at the household or community level.

  The main disadvantage is the size (and therefore capital cost) of the catchment and storage structures required to provide water right through the dry season. This problem is most acute in locations with long dry seasons, which tend to be those inhabited by poorer people, for obvious historical reasons. It is common in such places to find that an adequate water supply would cost more than a house: a situation that the people clearly cannot afford. Smaller, more affordable, storage volumes provide a seasonal boost during and after the rainy season (which can be useful for saving time at harvest) but their owners still need another water source for the latter months of the dry season. That is already the most difficult time of year for water, so the rainwater harvesting does not properly address their most critical need.

  A corollary of this problem is that the government will often record as ‘served’ a household for which some rainwater storage is constructed, and will therefore not plan to provide any other water services; but in reality those people are not served in the dry season.

  Rainwater harvesting is well suited for institutional supplies (eg schools, health posts). These have large roof areas, usually of impermeable material, and a comparatively predictable and important water need. The teachers at such schools commonly confirm that pupils’ attendance rates rise after rainwater tanks are installed because the children’s parents see the children’s time at school as a net positive asset in terms of the family’s daily water planning, rather than a net negative asset as for a school without water.

- [On the third bullet point: I don’t understand what ‘decentralised supplies’ means, under a heading of ‘alternative and indigenous technologies’. Does it mean that planners should ask the people what water supplies they actually have locally rather than assuming that all needs must be met from large external sources? If so, this is a good idea. Many places in developing countries

have small local supplies (springs, streams, wells) that are not shown in government planners' maps of water resources but can provide enough water for the local people if properly managed.]

- [For the fourth bullet point here is some text:] In many places with short, intensive rainy seasons (e.g. India) much of the rainwater runs off rather than infiltrates the ground. Even minor civil engineering work (such as building simple bunds along the contours in fields or check dams in stream beds, and desilting existing village ponds) can slow the runoff and increase the infiltration, thereby making groundwater available much longer into the dry season. WaterAid's experience in South India, for example, has shown this to be extremely effective even on a small scale with all construction and maintenance work done by the users themselves. The increase in infiltration, and then in retention of water through the dry season, depends on the permeability of the soil and the characteristics of the underlying aquifer. But professional geotechnical investigations would cost more than the work itself, so in most circumstances the people can simply go ahead and do the work.

  Appropriate and cost-effective techniques for groundwater abstraction can also help to reduce the demand for surface water, as demonstrated by the box from Nepal.

Box for fourth bullet point: Groundwater abstraction in Nepal

In Nepal, many communities use the 'sludger' method for drilling tubewells. This cheap, labour-intensive method, which was originally developed in Bangladesh, uses the action of a pipe reciprocated by hand and circulating water to bore through sedimentary ground. Problems arise when stones or hard layers are encountered. For some years, the Nepali NGO Nepal Water for Health has been working with local communities to improve drill bits and well screens, develop safety measures and disinfect completed tubewells. All the changes were made in close collaboration with local artisans and grew largely from their suggestions, which in turn confers a greater sense of local ownership.

All of these measures together make the tubewells a more attractive and practical source for people's drinking water. This lessens the demands made on surface water sources.

[end of box, no formal references as it came from my personal knowledge]

- [On the fifth bullet point: I know little about desalination. Taking an astronaut's eye view of our planet, it is basic common sense to convert salt water into fresh since so many of the world's people live near the sea. This will become even more sensible in the future as the big coastal cities of South Asia, which have already been identified as a critical location for water shortage and for increasing competition with agriculture, grow rapidly and suffer saline intrusion of their aquifers. The only practical problem is the cost of the large amount of energy that our current desalination technology requires. The solution is therefore to develop low-energy use desalination. Given how obvious this logic is, many people have thought of this and have tried but, so far, failed. We should therefore regard this as a long-term goal rather than a short-term one.]

- [On the sixth bullet point: pollution reduction surely has a big role in managing existing water more efficiently and therefore reducing demand for new sources. This is in effect how much of the UK's water is managed; the population of London drinks the same water six times (Thames Water can confirm the figure) before it finally reaches the sea. I sense that currently pollution control is mainly of interest in industrialised countries rather than developing ones, because it is a second-generation technology (it implies that there is water to be polluted). Again, taking the long-term astronaut's eye view, pollution must be controlled in order to sustain our species' future

on the planet: we may reach a steady-state 10 billion population by the middle of the next century, but we will need to have a steady-state supply of clean water for them, not a deteriorating one.]

- [On the seventh bullet point: I do not think piping from reservoirs is viable for the provision of basic water services in rural areas. In the 12 countries in which WaterAid works, for example, I cannot recall a single example of this either being done or even discussed. The two main factors against this concept would be the very high capital cost of piped distribution systems to scattered rural populations, and the fact that poor people generally live in drier places where there are no reservoirs.]

Section 4.1 A Demand management:

- [On the first bullet point the obvious line is to advocate the private sector because it is technically efficient. But this is not the whole story. Leakage control, for example, is very expensive; I find it rather hypocritical to hear people lambast the developing countries for leakage rates of 50% when we have 40% in London. Singapore (which I think, interestingly, is still public sector managed) has only 7% because it has a lot of money. Reducing illegal abstractions, in contrast, needs not money but communications. The utility has to talk to the people, find other ways to serve them, persuade the politicians to pass and enforce legislation etc. Billing and collection is probably a private sector strength, but again benefits from good communications all round.]

- [On the second bullet point I believe that pricing policies provide the biggest tool for good demand management, especially the differentiation between municipal and agricultural water: the politicians have to impress upon the agricultural lobby the value of water to others. I haven't encountered differentiation between drinking and other domestic uses, just between large and small customers. We should also discuss tariff policies (on which there is a box in Vision 21) especially the cross-subsidy to poor people from rich people and the question of how to break out of the 'low tariff – low maintenance - poor service – unwillingness to pay – low tariff' spiral. On the latter point I can see the logic of the World Bank-favoured tapering subsidy. This gives the utility enough money immediately to invest in improving the service while spreading the tariff increases to the users over a few years, during which time they will come to enjoy that improved service and therefore become more willing to pay the higher tariff.]

- [The third and fourth bullet points are really one point. Here is some text:]

  All around the world, it is a basic part of human nature to want to improve one's own life. If an individual or family can find a way to improve their water supply or sanitation, they do so without waiting for help. If the situation is more complex, families and communities work together to achieve what they wish. Only if their own resources are insufficient do they seek help from an outside organisation such as the local government or an NGO in the area. At that point, it is important for the staff of that organisation to respect the importance of the people's own views and to work with them, rather than to take over all the decision-making from them.

  That is the essence of community management. The recognition of the effectiveness of community management has been one of the most important lessons from the past twenty years' work in water and sanitation. Non-governmental organisations have often been active, training and encouraging the people in their work. Local and national governments, too, have become more responsive and supportive of the concept.

  There are many distinct advantages to community management, compared to the traditional system of decision-making and service provision by central authorities, for example:
  - it recognises the people's right to participate in decisions affecting their lives;

- the people, who know their own situation better than any outsider can, identify their own needs and priorities and plan the water and sanitation services accordingly;
- the people use their own knowledge of the extent and seasonality of their water resources, and of the local availability of construction materials, to plan their supplies;
- the talents of many members of the community are used, whether they be in management and organisation or in practical skills and construction work;
- the people feel a strong sense of ownership and commitment to their new water and sanitation services, and therefore pay for and maintain them better;
- the experience gained by the community during a participatory water and sanitation project can be a catalyst for other development activities;
- health gains are due principally to successful hygiene promotion, which in turn depends on the full involvement of the people and therefore goes hand in hand with community empowerment in all aspects of the project;
- by mobilising the time and resources of the people, the finite resources available from the government can be spread further and achieve more;
- replication and coverage can increase more rapidly, because people need less outside help.

Consequently community management has a positive impact on both coverage and efficient use of water resources. These advantages are greatest when using discrete water sources, as is usually the case in rural areas. In cities, it is more difficult to achieve these gains through community management, but not impossible. Community management does not reduce the total demand for water, but by using local water resources efficiently it can reduce the need for external water resources.

One difficulty relating to community management is that the organisations promoting it are mostly small and lack the resources to publish their work. Therefore there is little written material on it, mainly produced by a few international NGOs (eg International Secretariat for Water, Programme Solidarité Eau, WaterAid) that do have the necessary resources. In other people's eyes this can devalue the importance of the subject, because of the high status generally given to published material. A description of the theory and practice of community management of water and sanitation services is given by Lane and Niedrum (1996: pp 198-220).

Another major problem is that governments are sceptical that communities really can mange their own supplies, particularly at any scale larger than, say, a village. On this subject also the lack of published material hampers the advocates of community management. The box gives two examples of successful large-scale community-managed water supplies.

Box: Large Scale Community-Managed Water Supplies

1. At Bwera, a remote location in western Uganda adjacent to the border with the Republic of Congo, a gravity-flow water supply serves over 60,000 people. It is the third-largest water supply in the whole country. Its construction, operation and maintenance were managed by the community, with initial support from the international NGO WaterAid. The supply, from a small river intake in the hills above a densely-populated plain, serves 14 small towns and villages. Each village elects a water committee for the maintenance of its distribution system, while a central committee is responsible for the source and the supply pipeline. Each committee has a written constitution, and the relationship between the central and village committees is also defined in writing.

Since the project was completed in 1996, significant numbers of people have moved into the area because of the reliable water supply. The District government has recently decided to site a new hospital there for the same reason, and the water committee has negotiated the tariff for a metered supply for that hospital. For most of the past three years, Bwera has been almost cut off by

insurgency and banditry associated with the civil war in the Republic of Congo, and yet the water supply continues to function well without any external support to the committees.

[no formal references as it came from my personal knowledge]

2. In the Arsi Zone of Oromia Region, Ethiopia, there are several large gravity-fed water supplies managed by the local communities, some dating back over ten years of successful operation.

The Hitosa scheme, for example, is the largest gravity-flow water supply in the whole country, serving over 60,000 people including one substantial town. Water from two springs runs through 140km of pipelines to 122 public tapstands and 300 household or institutional connections. The engineering work was designed by the Ethiopian government and constructed by the people themselves with the technical support of the government and financial support from the international NGO WaterAid. The scheme's operation is managed by a Water Management Board made up of representatives of every community supplied. The Board employs over 70 staff to operate the service, and the tariffs charged cover all the running costs. Taking the year 1996-97 as an example, the tariff was set at approximately $0.16 per cubic metre, the total income was $25,000 and total expenditure $21,000.

Hitosa's success may be attributed to: the severity of the water problem and hence the highly-motivated community; the choice of a source and technology appropriate for the community to operate and maintain; the government's policy that positively favoured community management; the strength of existing community institutions; the comparatively educated and agriculturally successful population.

(Silkin, 1998)

[end of box]

[text continued:] Community management is generally considered to be a rural phenomenon. This is wrong: there are many community-based organisations active in the cities of the developing countries, whose basic premise is that the urban poor can be mobilised as development actors. Indeed it is well recognised within the water and sanitation sector that the cities will present the largest problems both for water demand and sanitation in the future (Black, 1994 and many other works). But research and publication on community management in cities is comparatively recent. One research programme by the international NGO Programme Solidarité Eau looks specifically at water and sanitation for the most neglected locations in Africa: small towns, informal neighbourhoods within cities and peri-urban areas (Oliver & Le Jallé 1999). It concludes that community-based organisations have as valid a role as the other types of organisation (such as municipal authorities, private concessionaires and ad-hoc project committees) that are moving into the managerial vacuum left by the shrinking of public-sector water distribution companies. It emphasises the importance of mediation and regulation for all these organisations.

- [On the fifth bullet point: A number of people are studying public-private initiatives (e.g. GARNET has started a new DFID-funded study, following previous work by and for DFID) and could provide good material. I personally believe that well-regulated public-private arrangements can be good for managing demand provided that the private sector partner is used for the tasks for which it is best suited rather than because a politician (or a multilateral agency) insists that a private company must be involved. BPD is mentioned in 3.1.3 of the draft findings document: a lot of people are quoting BPD as the shining hope in this area, but actually it concentrates only on the special case of tri-sector partnerships, while many others are looking at bilateral private-public partnership. Also, BPD will be quite slow-moving (I speak as its outgoing Chair!) to come up

with concrete results because so much of its early energy has been devoted to the three sectors working comfortably together both at project and global level – this is a worthy aim in itself but not very tangible.]

Section 4.2 Water Markets and transfers – impact on demand for storage and costs?

[I am sorry but I know little about these. They are occasionally discussed at water sector conferences, with the same one or two examples always being quoted (for reference, ask the World Bank water staff). I suspect they are a clever plaything for development intellectuals rather than a practical help for improving service. My impression is that they need an educated population and sophisticated systems of water licensing and regulation. That would imply limited applicability in, say, Africa. As to their consequences for poor people, I expect them to be negative because human commerce is largely founded on the rich benefiting from the poor and I see no reason why commerce in water rights would be any different.]

[If we want to discuss clever ways of manipulating resources, I suspect that in the long term we should persuade governments to promote agriculture appropriate to the available water resources in their countries and to buy other crops from the places with more water, i.e. to use the concept of 'virtual water' devised by Tony Allen of SOAS. I know that this would lessen national self-sufficiency, which politicians dislike, but on a global scale it would make good sense.]

Section 4.3.1 Procedures for forecasting demand

[A few brief comments, as I expect you have this section well covered already. They are not linked to specific bullet points but to the whole section, nor are they in any particular order:]

Forecasting demand involves relatively simple mathematics, comprising population projections, consumption per person for various uses and comparison with present levels of consumption.

One problem is in knowing present levels of consumption or coverage. National coverage statistics are weak and variable, as the WHO/UNICEF Joint Monitoring Programme has discovered. Different countries use different definitions of access to water, both in quantity per person and in distance from the home. Some countries have changed their definitions, which complicates the analysis of progress. Some countries do not even report statistics. Coverage data can also be manipulated for political purposes. Most developing countries do not monitor water quality systematically, and hence cannot distinguish between available water and available clean water.

Despite the problems, numerical targets remain extremely important. Vision 21, for example, devotes a chapter to setting targets and indicators and monitoring achievements. Forecasting demand is an integral part of this work.

The level of demand generated by new water supplies can vary widely. The traditional government approach was to aim for whatever was the national standard consumption per person. Now, however, concession contracts in cities generally require universal provision of household connections in short timescales, with the implication that those new users can draw as much water as they want to pay for. This could lead to considerable extra demand for water, and to considerable drainage problems (as the contracts generally specify longer timescales for sewerage provision).

Coverage levels are often driven politically, but also by questions of global equity. Taking the motor car for example, by what right do people in industrialised countries, who typically own one car per two people, deny the same privilege to people in developing countries? And yet there is no realistic

prospect of production at that rate worldwide. The case of water is different in that it is much heavier to transport in comparison with its value than, say, a motorcar and so it is much less tradable: but in the years ahead its value will increase and the arguments of equity will become more heated.

Programme Solidarité Eau's recent research (Oliver & Le Jallé 1999) has shown that an indirect approach to forecasting demand, by collecting data on currently observable behaviour and inferring demand for an improved service using models based on consumer demand theory, has produced scarcely any valid results. A direct approach, by asking potential users their willingness to pay for various hypothetical types and levels of service, seems more promising. For example it correlates variations in consumption strongly to the two variables of cost and distance to the source. That research also indicated that many existing centrally-planned water supply projects are over-sized due principally to over-estimation both of demand per person and of the total number of people to be supplied. Combined with the well-observed tendency for each individual project to concentrate on its own work in isolation of the bigger picture, the result is both inequity between different users and overall inefficiency in water resource usage. Improved national co-ordination and planning that transcends the project approach could alleviate both of these problems.

Section 4.3.2 first subheading The influence of future sanitation provision on water demand and water quality:

- [For the first bullet point, here is some text:] During the next 25 years, some 5 billion people will be needing sanitation services. The choice of technology for those services will have a major effect on water demand forecasts. There is currently a large gap in the world between the lucky few people who enjoy conventional waterborne sewerage and the vast majority who do not. The decision makers, who usually belong to the first group, have made little impact on bridging that gap or understanding the different possible technical options.

  'Conventional' waterborne sewerage is actually a recent development. It has only been available on any significant scale for a hundred and fifty years. It uses enormous quantities of water (in the order of a hundred litres per person per day) simply for transporting wastes from the house to the treatment works, water which in the majority of systems has been expensively purified to drinking standards. This is a convenient but extravagant luxury for the rich, unattainable for the rest of the world both in financial terms and water resources. And yet planners normally take waterborne sewerage as the desirable benchmark with few, if any, alternatives recognised.

  There are, however, alternatives. Various forms of small-diameter shallow sewerage, some with separation of solid from liquid wastes, have lower capital costs and water usage (typically some tens of litres per person per day). These have been used for some time in parts of South America but scarcely elsewhere. Offset pit latrines or septic tanks require even less water, typically only a few litres per person per day. Direct pit latrines may be operated either as pour flush with a water-seal or as dry latrines using no water at all. They may be periodically emptied by hand or by machine, or new pits dug when the old ones fill. These alternatives need not be less hygienic than waterborne sewerage: Japan, for example, has only 39% coverage with conventional sewerage (compared to coverage typically over 80% in Europe) and yet it has the highest life expectancy in the world.

  The main emphasis in current sanitation work is to increase coverage by reducing unit capital costs and by changing from technology-led approaches to social marketing approaches led by hygiene promotion. These principles inevitably favour on-site sanitation with low or no water usage, which also generates less demand for water and is therefore a welcome development for those people concerned with water demand management.

- [For the second bullet point, here is some text:] Many industrialised countries are beginning to promote lower water use systems. Australia, for example, combines a high standard of living with low water availability in many areas, and there are many local bylaws prohibiting more wasteful technologies. In Europe low-flush and dual-flush toilet cisterns are becoming more widespread: but they still link into the massive infrastructure of waterborne sewers. These technical developments are compromises designed to marginally reduce the water consumption of sewered systems.

- [For the third bullet point, here is some text:] The impact of lack of sanitation on drinking water quality depends on the physical location of the water source in relation to the population. Surface water sources are inevitably vulnerable to upstream pollution, and that pollution is getting worse as populations increase. It comes both from domestic waste (including excreta) and from industrial contamination. The former is arguably easier to resolve, as any on-site sanitation system will dramatically reduce the amount of pathogens released to the environment.

[Also in 4.3.2 Some comments on the Household-Centred Environmental Sanitation model:]

It is now well-established that health benefits accrue from the combination of improved hygiene, sanitation and water, and not from clean water alone. However, for many years work on sanitation has lagged behind water supply. There are various reasons for this, mostly linked to sanitation's basic lack of appeal to the professionals (mainly engineers) who lead water and sanitation agencies. Recently a number of committed sanitation professionals have started various initiatives to boost sanitation work. The Global Environmental Sanitation Initiative (under the aegis of the Collaborative Council), the Strategic Sanitation Approach (developed by the UNDP/World Bank Water and Sanitation Program) and the Household-Centred Environmental Sanitation (HCES) Model are all such examples.

The same basic principles underlie all these examples. These include: appreciating that sanitation is not just a technical subject but has many other social and behavioural aspects; promoting sanitation through educating people to raise the priority that they themselves give to it rather than through the artificial stimulus of subsidising a particular technology; promoting a wide range of (mainly on-site) sanitation options.

The Strategic Sanitation Approach is currently under discussion among sector professionals. The consensus is emerging that strategic thinking needs to be conditioned by the bottom-up demand-driven approach as well as by conventional centralised policy making.

On-site sanitation, chiefly pit latrines or pour-flush latrines, involves one self-contained sanitation system being constructed and operated by each household. It is therefore common sense to base the work and the decision-making at the household level, and the HCES model merely enshrines this common sense in a formal title.

[Some brief comments on the draft text on HCES in Section 3.2.3 of the "draft of key findings and recommendations":
First bullet point: It is really a decision-making sequence rather than an administrative structure.
Third bullet point: I do not agree that HCES could equally be applied to water demand management or water resources management. The fundamental difference is that sanitation is physically household-based (except sewerage systems) whereas water supply and water resources management function at a physically larger scale. They require concerted action by a larger number of people, the smallest decision-making unit commonly being the "community" ie village or slum. (There is one exception to this: a rare situation, as in Zimbabwe, in which each family digs its own well and so has a self-contained water resource.)
In conclusion, I would not push HCES as a major plank of the recommendations. I would rather advocate the integration of sanitation and hygiene promotion with water supply and the sanitation principles mentioned above. HCES itself is just one new piece of jargon.]

Section 6 Adequacy of the institutions and processes for reviewing options

- [For the third bullet point, here is some text:] There is little published information giving specific examples of formal options assessments. In particular, there are few discussions of the process of choosing between ground and surface water. This decision is usually made on the grounds of availability, quality and cost. Most engineers agree that it is preferable to find a source that supplies sufficient good quality water and protect it rather than to take water from a less good quality source and treat it. This logic naturally favours groundwater as a source. A recent short paper (Mimi and Smith, 1999) reviews a large range of multi-criterion decision-making techniques specifically relating to water resource planning. The techniques are intended to consider financial, technical, hydrological, political, institutional, environmental and social viability of different options, and cover both ground water and surface water. The authors have since applied these techniques to real examples of the water resources of the West Bank.

[An extra comment on the third bullet point: you might want to include Table 2.7.6 of the DFID Guidance Manual on Water Supply and Sanitation Programmes (or something similar) as it makes sensible points on source selection.]

Box under third bullet point: Source selection in Lao PDR

A project recently started in Lao PDR under the new water and sanitation strategy (see box below) gives people an informed choice of sources and project types. People choose from what is technically feasible and what they want and can afford to pay. The external financial input is small: 35% of capital costs for water supply and 25% for sanitation. This puts a big responsibility on the District staff to adequately and fully inform the communities, who are expected to own and substantially pay for the water and sanitation services. A series of discussion charts and staff training materials has been developed. These set out the advantages and disadvantages of various options, the possibilities for local inputs, life span, future upgrading potential and, importantly, capital and recurrent costs of those different technologies and source options. (For example, the options might range from improving hygiene behaviour or traditional practices through improvement of local sources up to full gravity-fed piped water supplies.)

(Seager, pers. comm. 1999)

[end of box]

- [For the fifth bullet point, here is some text:] People can best be involved in assessing options through civil society organisations. These can be registered NGOs or informal community groups, religious or social development groups, membership organisations or simply gatherings of people who live in a particular area. These organisations provide the people with trustworthy and familiar channels of communication through to more remote bodies such as the national government. In Senegal, for example, the process of meetings convened by the Collaborative Council (itself an international NGO) to debate the contents of its Vision 21 is becoming institutionalised by Senegalese organisations as a way to co-ordinate and monitor their water and sanitation work more generally.

Box under fifth bullet point: Policy-making in Lao PDR

A new strategy for the rural water supply and sanitation sector in the Lao Peoples' Democratic Republic has been developed over a 30-month period. The strategy was developed through a series of meetings, workshops, conferences and consultations involving a very broad range of people and

organisations. The process was designed specifically to maximise the influence of community-level planning on national-level planning. The outcome was a strategy in the form of a guiding framework, not a top-down master plan.

The experience of developing the strategy indicates that community-level demand-based planning and national-level policy guidance can be fully in harmony if:

- the central guidance is developed with broad participation vertically down to District and community level and horizontally to other stakeholders;
- a cut-off point is clearly defined and agreed for the level of detail to which the centralised guidance is developed;
- the centralised guidance gives enough flexibility and options for a truly demand-based decentralised planning and implementation process to emerge;
- learning and feedback mechanisms link the central guidance and the local planning, which support each other.

Other positive features of the process of developing the strategy were:

- a high ownership of the process by Lao nationals, both in central government and locally;
- an emphasis on the importance of the process itself;
- built-in learning and capacity building of the various organisations involved;
- innovative contents of the guidance framework (eg shift of resources to remoter areas, gender equity, application of the Dublin principles);
- a flexible financial support agency (Sida);
- a technical support agency (UNDP/World Bank Program) committed to long-term lasting results;
- other external partner agencies (eg UNICEF, bilaterals, World Bank) willing to adapt their policies to suit the new strategy;
- a strong link with new investments in the sector.

New projects based on the strategy are now under way in seven 'spearhead provinces' which involve community-based planning based on real demand and informed choice, set within the guiding framework of the strategy.

The process for developing this strategy in Lao PDR is now being mirrored in Cambodia. The Lao experience has also triggered interest in the sub-region: a recent six-country Networking and Learning event held in Lao PDR used the strategy work and the field experience to date as triggers to discuss the key sector issues.

(Chanthaphone & Seager, 1998; Seager, pers. comm. 1999)

[end of box]

Box under fifth bullet point: Sanitation decision-making in India

The Indian Government started a Central Rural Sanitation Programme in 1986, with corresponding programmes at State level also. Initially these programmes concentrated mainly on providing standard designs of latrines at high subsidies but with minimal marketing or educational work.

In a few locations, experimental Rural Sanitary Marts were set up with UNICEF's support, working on a very different basis. They promoted sanitation and hygiene through vigorous marketing and education and made latrine components available locally at little or no subsidy.

These proved very successful and, with the approval of the government, RSMs have spread to many parts of the country. Statistics indicate that four times as many people are constructing their own latrines through the RSM system than through the original government programme. The government

has now taken this into account in its national-level planning and forecasting, and has recognised the RSM movement as a major part of the overall Programme.

(Ghosh, pers. comm. 1999)

[end of box]

Box under fifth bullet point: Policy-making in Ghana

In Ghana a group of national NGOs, supported by the international NGO WaterAid, had the idea in the late 1980s to host an informal policy conference. The first such meeting was held in the Mole National Park, was well-attended and clearly filled a felt need. This conference has become an annual event, known as the Mole Conference. It provides an opportunity for government and civil society people and organisations to meet in an atmosphere of mutual respect and to develop consistent policies. The Ghanaian government promulgated its national water and sanitation policy in the mid-1990s, influenced by the discussions at the successive Mole Conferences. Ten years on, the Conference is as well-attended and important to the sector agencies as ever.

[end of box, no formal references as it came from my personal knowledge]

[Still on the fifth bullet point, here is more text:] Over half of future population growth in developing countries will occur in the small towns, informal neighbourhoods and peri-urban areas. In those locations, water and sanitation services cannot be planned or provided by a single system or organisation; composite systems and different types of organisations capable of working in a complementary way will become the norm. This is turn will produce an immense need for regulation and mediation to enable those organisations both to respond to the aspirations of the users and to assess the best options for using available water resources.

Miscellaneous

[When discussing coverage figures and consumption patterns, the most authoritative figures come from the WHO/UNICEF Joint Monitoring Program (JMP). The JMP's figures for 1994 are widely available, and include projections to 2000 although the latter now seem too inaccurate to be relied upon. The next figures to be released will relate to 1999 and will be published in draft in December 1999. I suggest that we should incorporate them into the Background (within Section 1) as soon as they are released.]

References

Black, M. 1994. Mega-Slums: The Coming Sanitary Crisis, London: WaterAid.

Chanthaphone, S. & Seager, M. 1998. "RWSS Strategy Development in Lao PDR", paper presented at International Conference on Rural Water Supply and Sanitation, The World Bank, Washington, 5-8 May 1998.

Ghosh, G. Chief, Water, Environment and Sanitation, Programme Division, UNICEF. Personal communication with authors. 27 September 1999.

Lane, J. & Niedrum, S. 1996. "People and Institutions", in Bailey, R. (ed) Water and Environmental Management in Developing Countries, London: Chartered Institution of Water and Environmental Management.

Mimi, Z.A. & Smith, M.D. 1999. “Selection of water resource management options”, paper presented at 25th WEDC Conference, Addis Ababa, Ethiopia, 1999.

Oliver, J-L & Le Jallé, C. (eds) 1999. Water Supply and Sanitation in Peri-urban Areas and Small Centres, Paris: GRET & Programme Solidarité Eau.

Seager, M. Country Program Manager, Lao PDR and Cambodia, UNDP/World Bank Water and Sanitation Program. Personal communication with authors. 24 October 1999.

Silkin, T. 1998. Hitosa Water Supply: A People’s Project, London: WaterAid.