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PREFACE

Each year the Overseas Development Administration (ODA) commissions a number of ex post evaluation studies. The purpose of the ODA's evaluation programme is to examine rigorously the implementation and impact of selected past projects and to draw out and highlight the lessons learned from them so that these can be applied to current and future projects.

The ODA's Evaluation Department is independent of the ODA's spending divisions and reports directly to the ODA's Principal Finance Officer.

Evaluation teams consist of an appropriate blend of specialist skills and are normally made up of a mixture of in-house staff, who are fully conversant with the ODA's procedures, and independent external consultants, who bring a fresh perspective to the subject-matter.

This evaluation is a synthesis of the following six evaluation studies and one review:

(i) CARE International in Sierra Leone - Moyambe Rural Water Supply and Sanitation Project, Sierra Leone, (February 1993) EV540, by M A Surr, Economic Adviser, ODA Evaluation Department, Team Leader - A McKaig, CARE's West African Regional Health Adviser - B M U Bennell, Consultant Engineer - Dr J Todd, Administrator, ODA Evaluation Department.

(ii) WaterAid in Uganda - Busoga Region Borehole Rehabilitation Project, Uganda, (December 1995), EV584 by Ben Fawcett, Environmental Health Engineering Consultant - Liz Juppenlatz, Social Development Consultant - Judy White, Ex ODA Senior Economic Adviser - Team leader.

(iii) Nepal Eastern Region Water Supply project, Nepal (January 1996), EV549 by J C H Morris, Head Evaluation Department ODA - Team Leader - Margaret Ince, Water Quality and Health specialist WEDC - Christian McDonough, Social Anthropologist, Oxford Brookes University - Peter Smith, Engineering Specialist, WEDC.

iv) Madura Groundwater Irrigation Project, Indonesia (October 1992), EV 548 by Dr Nick Chapman, ITAD Ltd, Team Leader - Fiona Dixon, Cargill Technical Services - Brian Pope, Sir A Gibb & Partners.

(v) Swaziland Rural Water Supplies, Swaziland, (June 1983), EV 303, by John Hodges, Engineering Adviser ODA - Dion Bell, Epidemiologist, Liverpool School of Tropical Medicine - Winston Lawrence, Swazi Rural Water Supply Board - Dr Harriet Sibisi, Swazi Ministry of Agriculture.

(vi) Lesotho Village Water Supplies, Lesotho (April 1977) by Richard Feacham

Civil Engineer, Director - Donald Curtis, Development Sociologist, Assistant Director, - Liz Burns, Bacteriologist - Sandy Cairncross, Civil Engineer, Field co-ordinator - Aron Cronin, Sociologist, lowlands field study - Piers Cross, Social anthropologist, mountains field study - Khalid Khan, Civil Engineer - Douglas Lamb, Economist - Hilary Southall, Medical statistician.

Review of the Gurkha Welfare Trust Project, Nepal (August 1994)
by B G Little, Engineering Consultant, G E Clarke, Social Anthropologist Consultant.

The evaluation process involves the following stages :-

(a) For each individual project evaluation:

initial desk study of all relevant papers;

consultations with individuals and organisations concerned with the project, including a field visit to collect data and interview those involved;

preparation of a draft report which was circulated for comment to the individuals and organisations most closely concerned;

submission of the draft report to the ODA's Director General (Resources), to note the main conclusions and lessons to be learnt from the study on the basis of the draft report.

(b) For the synthesis study:

preparation of the synthesis report which seeks to draw out the main points from the individual reports and identify the key lessons learnt; and

meeting of the ODA's Projects and Evaluation Committee with Evaluation Department and the author to discuss the main conclusions and lessons to be learnt from the study on the basis of the draft report.

This process is designed to ensure the production of high quality reports which draw out all the lessons.

C P Raleigh
Head, Evaluation Department.
May 1997

ACRONYMS AND ABBREVIATIONS

CIDA	Canadian Government's Aid Agency
Danida	Danish Government's Aid Agency
DWSS	Department of Water & Sewerage, Government of Nepal
EC	European Commission
FINNIDA	Finnish Government's Aid Agency
GWT	Gurkha Welfare Trust
HESAWA	Health Through Sanitation and Water (Programme)
IRC	IRC International Water and Sanitation Centre (formerly the International Reference Centre for Community water Supply and Sanitation (IRC))
LSHTM	London School of Hygiene and Tropical Medicine
MoHs	Ministries of Health
NGO	Non Governmental Organisation
ODA	Overseas Development Administration
O&M	Operation and Maintenance
PEC	Projects and Evaluation Committee (ODA)
PRA	Participatory Rural Appraisal
SIDA	Swedish Government's Aid Agency
SWACH	Sanitation Water and Community Health project
TC	Technical Cooperation
UNDP	United Nations Development Programme
UNICEF	United Nations International Emergency Programme
USAID	USA's Government Aid Agency
VIP	Ventilated Improved Latrines
VLOM	Village level operation & maintenance
WASH	Water and Sanitation for Health Project
WHO	World Health Organisation
WID	Women in Development
WTP	Willingness to pay

EVALUATION SUMMARY

BACKGROUND

1. This study synthesises the findings and lessons learnt from rural water and sanitation evaluations carried out by ODA and other donors. It summarises the consensus from research aimed at advancing knowledge of the relationship between water and sanitation and diseases associated with poor water and sanitation facilities. It compares best practice in appraisal methodologies with actual practices.

2. The evaluation was undertaken by a single consultant as a desk study, based on material collected from donors and via a library search by ODA. Given the necessarily selective nature of the exercise, the material may not be fully representative of the large number of water and sanitation projects undertaken by donors over the last 15 years.

3. The overall conclusion is that research has greatly advanced knowledge on the appropriate interventions required in the rural water and sanitation sector for health and time savings benefits to occur, and new methodological approaches have been pioneered for use in project appraisal, design, implementation and evaluation. Putting this new knowledge to effective use, and adopting best practice in the field has proved harder to achieve. There has been a growing recognition by all donors of the importance of demand in determining project sustainability, but a reluctance by some, on equity grounds, to acknowledge the implications of this fully.

4. Projects reviewed had mixed success rates. The most successful were those that had taken account of demand or felt needs for improved water and sanitation, as perceived by the community. Health benefits were smaller than foreseen at appraisal, due to limited changes in associated hygiene behaviour, malfunctioning of water points and their non-use by intended recipients. More projects had significant time savings benefits, mainly benefiting women. The long term sustainability of many projects is at risk, because inadequate attention was given at design to operation and maintenance, affordability and cost recovery issues. ODA projects were neither better nor worse than average.

FINDINGS

(i) Health and Hygiene Education

5. *Increasing the quantity of water*, to enable more water to be used for personal and domestic hygiene purposes, has greater health benefits than improving the *quality* of water, (2.3 & 7), but donors continued, in the 1980s, to give high priority to improving the quality of water (3.7, 4.10-12).

6. Improving sanitation facilities may be *more* important to improved child health than improved water supplies. Health-associated benefits from water *depend* on sanitation improvements. Sanitation projects, however, have been accorded a much lower priority by donors and recipients because they are intrinsically more difficult (3.8).

7. Changing hygiene behaviour is the key to reducing the incidence of water-associated diseases, but knowledge is limited (the mid 1990s) about the conditions under which behavioural change will occur. (2.15 & 16). There is a wide gap between knowledge of improved hygiene behaviour and the putting of this into practice (4.36 & 37).

8. Donors displayed in the 1980s a widespread lack of understanding of the complexities of changing hygiene practices. Very few surveyed hygiene beliefs and practices in communities prior to project design (3.9). Health benefits from many projects were therefore smaller than foreseen (3.2, 3.6, 4.37).

9. Hygiene education is most effective where it is not the first point of interaction between donors and communities, is based on accepted village practices, and uses local trainers and locally produced materials (see Box 6).

10. Health impact studies, taken as a whole, provide firm evidence of the link between water, sanitation, hygiene behaviour and health. The evidence, however, from individual studies, is very weak (2.13).

11. It is likely that health benefits are maximized where distance from water is greatest or where the environment is most faecally polluted (2.14). In these circumstances, time savings benefits are typically high enough to give projects a positive economic rate of return (2.21).

12. Difficulties in measuring health benefits from water and sanitation projects have led to the development of proxy health indicators (2.15 & 16). These have not been widely used by donors to measure health benefits.

13. Water and sanitation projects were rarely justified on the basis of the severity of associated health problems in the project area compared with those elsewhere. Nor were broad patterns of diseases established and interventions prioritised and designed accordingly. Projects to combat guinea worm were an exception (3.6, 4.10, Annex D paras 27&28). Typically, the strategies for hygiene education and sanitation were much less well developed at design and appraisal than those for the water hardware components (4.3, 4.10, Box 10).

14. The priorities and working methods of the different institutions involved in rural water, sanitation and health are very different, and this can lead to tension. It is usual

for the technically orientated Water Departments to determine the pace of the project, sometimes at the expense of the activities of the more community-orientated Ministries of Health. In the most successful sanitation programmes their implementation phase has been de-linked from that of water supplies (3.10, 4.18, Box 11)

(ii) Felt Needs and/or Effective Demand

15. The failure of many rural water and sanitation projects in the 1980s led to the development of two new paradigms which sought to establish conditions under which schemes would continue to function and be used after project completion. One of these, which stressed that projects were not reflecting communities' *felt needs*, led to the advocacy of greater community participation in project design. The other, which saw that projects were supply driven, led to the view that the standard of service to be provided should be determined by effective demand (2.17 & 22).

16. Most rural water and sanitation projects in the 1980s were designed to more fully involve communities in managing their own water supplies, (village level operation and maintenance systems) in response to governments' budgetary problems, and the consequent need for community self-reliance. This made designing projects to meet communities' real needs even more vital for project sustainability (3.13).

17. Participatory development, i.e. involving users in *decision making*, goal setting, design and management, increases the chances that water and sanitation facilities will be financed, used fully and looked after properly (2.17, Box 7). Donors, however, have typically presented a standardised technical package (3.16, 4.5, 4.7). Participation has mostly been limited to the construction phase and has usually entailed a contribution of labour, materials or finance rather than involvement in planning or management (3.16, 4.14). Where projects do not meet community needs, use of participatory techniques will not engender ownership (2.20).

18. Participatory appraisal techniques are not always used for the purpose intended, ie to learn about communities' perspectives and involve them in the design and delivery of programmes (4.20), but have sought instead to "extract information" (3.17).

19. Participatory appraisal results in better identification of felt needs at the expense of more speedy disbursement of aid funds (3.10, 3.18).

20. People have very strong views on what standard of water service they want, are willing to pay for, and will *use* in preference to existing water sources. The widely used rule of thumb that households' ability to pay for water is some 3-5% of income is not backed up by empirical evidence (2.29 Box 4). Where 'willingness to pay' is high, investment in improved water supplies may be justified on time savings benefits alone, and provide an insight into the likely take-up of the new facilities (2.20).

21. Latrines are generally low on rural households' list of priorities. There is disagreement among the donor community whether sanitation programmes should respond to demand, or create it.(3.19)

22. Most donors in the 1980s assumed that they knew what the felt needs of a community were, and chose the level of service on equity grounds, ie' the some for all' approach. Many projects were supply driven and ignored demand factors (2.21, 4.4). Where project facilities did not match demand, people did not switch over to use of the "improved" facilities (3.14 & 15, 4.29-31).

(iii) Sustainability

23. The community's commitment to operation and maintenance of new facilities is the key to project sustainability and the choice of technology must reflect their wishes. This is even more pertinent for latrines, which are consumer products, than for water supplies (3.19, 3.24, 3.25).

24. Long term project sustainability has been put in doubt in many projects through failure to plan operation and maintenance arrangements for water supplies early enough in the project design stage (3.24, 4.9, 4.41).

25. Many projects gave insufficient thought at the planning stage to the way long term O&M costs would be met, so undermining financial sustainability (3.25).

(iv) Cross Cutting Issues

26. In the 1980s it was the rule rather than the exception for donors to focus on women in water and sanitation projects. Strategies failed, however, to take account of differences in decision making and the division of labour between men and women in the home and in local communities. This failure to look beyond a traditional view of a women's role reduced project effectiveness (3.27, Box 9, 4.40, D55 & 6).

27. The strategy for reaching the poor was primarily to provide communal water facilities and low cost latrines. The validity of the approach was not generally analysed at evaluation. Evaluation studies of some projects (3.29) and research studies both shed doubt on the efficacy of this approach (2.29, Box 4).

28. Environmental issues were not usually covered in rural water projects in the 1980s, but have become more visible in the 1990s, primarily as competing demands for water have put pressure on water resources (3.26, 3.30, 4.12).

(v) Implementation and Monitoring

29. Implementation has been largely driven by the projects' engineering components. This has prevented the health and hygiene and sanitation components from being fully integrated into the whole (3.10, 4.4, 4.16 Box 11).

30. Monitoring has focused on physical targets and project expenditures. Broader participatory indicators of success developed in the 1990s, reflecting the developing capacity of communities to operate and maintain new water and sanitation facilities, the use of facilities and changes in hygiene behaviour, are better measures of project outcomes (2.19, 4.26).

(vi) Role of Non Governmental Organisations (NGOs) and Private Sector

31. NGOs can be effective aid partners in delivering rural water and sanitation projects, where their potential advantages - apolitical nature, ability to mobilise and adopt new ideas quickly and to make effective use of indigenous staff - outweighed their potential disadvantages - lack of technical expertise and inexperience in strengthening local institutions and promoting community participation (4.18 - 4.23).

32. There was limited use of the private sector in the projects surveyed. A competitive private sector has a potential role to play in planning and implementation, and in O&M, where there is an effective demand for the service to be provided. A disadvantage of using private companies is their unfamiliarity with a participatory approach to planning services (4.24 & 25).

(vii) Humanitarian Aid

33. Large-scale outbreaks of faecal-oral diseases (dysentery and cholera) are normal in crowded refugee camps. Donors tend to concentrate on the provision of clean drinking water and to give too little attention to sanitation facilities. Treatment of diarrhoeal cases is often inappropriate and ineffective (5.2-6).

LESSONS LEARNT

34. While broad patterns of disease and their associated economic and social costs should guide the overall strategy to be followed in rural water and sanitation projects, expected health benefits cannot be an operational tool for the fine-tuning of interventions or for project evaluation (10, 13).

35. It is both equitable and efficient to target those groups that are furthest from water, and where the environment is most faecally polluted. Estimates of time savings can provide an insight into the likely take-up of new water facilities (11).

36. Without accompanying sanitation and hygiene components, water projects will have very limited health benefits (5, 6, 7).
37. Donors must be prepared to devote more resources and time to finding out what communities want, to designing culturally appropriate hygiene education programmes and to developing new institutions at community level. If physical work outstrips the pace at which the process of social change can occur, this will be at the expense of project success and sustainability (7, 8, 14, 19).
38. Unless the felt need for improved water and sanitation facilities is strong, no amount of skilful marketing and participatory processes will succeed in motivating people sufficiently to use and look after (and pay for) the new facilities provided for them (17).
39. Successful projects are those that take account of both supply and demand conditions in the project area. If the standard of service provided does not match demand, new facilities will soon be abandoned by those for whom they were intended (21).
40. Sanitation requires its own resources and its own time frame to achieve optimal results, and should be treated as a priority issue in its own right and not as an add-on to a more attractive water supply programme (14).
41. Donors still need to find an appropriate balance between prescription and choice - between satisfying accountability requirements and allowing communities' priorities and capabilities to determine the direction and speed of events (19).
42. Planning for O&M of water supplies should begin at the design stage, when it can influence the choice of technology. Realistic O&M plans cannot be tacked on as an afterthought, when it is too late to make them consistent with available resources and capacities (23 & 24).
43. Water must be paid for, like any other service. The likelihood that users will be prepared to pay is vastly increased where the level of service provided is what they want (20, 27). Initially, to help create demand, it may be necessary to subsidise sanitation services (21).
44. More effort is needed to improve gender analysis in rural water and sanitation projects to improve equity and efficiency. Programmes should guard against directing messages only to women or placing the burden of sanitation improvements and hygiene education primarily upon women. Gender considerations should be included in performance indicators (26).

45. 'Willingness to Pay' studies or participatory appraisals are better methods for ensuring that the poor will benefit from new water facilities than the assumption that public water points are equitable (20, 27).

46. More attention must be paid to environmental issues at appraisal and design. Where competition for water is especially strong this may need to take the form of integrated water and land use management. It will become more important to "get the price of water right" (28).

47. Establishing good working relationships between the different institutions involved in rural water and sanitation projects is the key to successful projects (29).

48. There are roles for NGOs and the private sector in the delivery of rural water and sanitation projects, especially in sanitation projects, where meeting consumer demand for hardware products is the key to success (23, 31, 32).

49. Emergency aid is most effective where it provides clean drinking water, to control outbreaks of water-borne diseases, backed up by sanitation facilities, in order to prevent disease transmission from person to person (33).

1. BACKGROUND

(a) Purpose of Synthesis Study

1.1 The aims of this evaluation synthesis study of rural water and sanitation projects are :-

- to disseminate, within ODA and other interested organisations, the results of and lessons learned from rural water and sanitation evaluations carried out by ODA and other donors;
- and thereby to help improve ODA's effectiveness in its support for rural water and sanitation projects and programmes.

Detailed Terms of Reference are at Annex A.

(b) Evaluation Methodology

1.2 An initial documentation search and collection was undertaken by ODA Evaluation Department which contacted bilateral and multilateral donors to request copies of their evaluations of rural water and sanitation projects and relevant research studies. Evaluation Department also undertook a library search of key academic literature on rural water and sanitation issues. The consultant then undertook a 30 day desk study to produce a first draft of the synthesis of the findings and lessons drawn from the documentation, (see Annex B for the complete list of documents). No visits were made to relevant institutions during the study to pursue specific points in greater detail, seek clarification on particular issues, or to update the information contained in the reports. The draft report was, however, circulated to each donor for its comments, and these have been taken into account in the final report.

(c) Report Layout

1.3 The report first examines key findings from research and current best practice in appraisal methodologies developed in tandem by multilateral and bilateral donors. Research findings and best practice are often closely related, as changes in the approach to planning and designing rural water supply projects have often grown out of field research. The report then summarises the experience of key bilateral donors in the field and highlights the recurring issues that have emerged. The ODA's own experience in seven rural water (and sanitation) projects over the past 20 years is examined next, plus three water and sanitation components of emergency aid packages. Given the necessarily selective nature of the material, the conclusions drawn may not be fully representative of projects in the field.

2. RESEARCH FINDINGS AND BEST PRACTICE IN APPRAISAL METHODOLOGIES

(i) Introduction

2.1 This chapter draws on the field research activities of donors and associated academic research studies aimed at refining and advocating new methodological approaches to the design, appraisal, monitoring and evaluation of rural water and sanitation projects. The three major themes examined are health, community participation and willingness to pay (WTP). Theoretical knowledge was considerably advanced in the 1980s and into the 1990s on the appropriate interventions required in the rural water and sanitation sector to produce health benefits and the ways to measure such benefits. This knowledge has proved harder to put into practice, as subsequent chapters of the report demonstrate. Concern that projects were failing to have the results intended, because they did not reflect the priorities of the communities concerned, led to two parallel developments. The first spurred on experiments with community participation in order to identify rural households' *felt needs* in the water and sanitation sector, involve them in the project planning process, and finally hand over to them responsibility for the finished project. The second developed an economic methodology to determine the *effective demand* for alternative levels of rural water services, the intention being that the community, not the donor, should decide on the appropriate standard of service. The major donor material drawn on in this chapter is from UNDP, the World Bank, the Asian Development Bank and WASH/USAID.

(ii) Health Benefits

(a) Findings on Link Between Water Supplies, Sanitation and Health

2.2 The benefit most frequently used by many donors to justify investments in rural water supply and sanitation projects is improved health. The assumption that access to improved water supplies would lead to substantial health improvements was the impetus behind the 1981-1990 International Drinking Water Supply and Sanitation Decade. Substantial research was undertaken during the 1980s to elucidate key aspects of the relationship.

The "Water is Necessary but not Sufficient" Criterion

2.3 Improved potable water supplies are a necessary but not sufficient requirement for better health. One of the earliest studies to appreciate the need for an *associated* health and hygiene education programme to realise the potential health benefits of a new water supply scheme was the Lesotho Village Water Supplies Evaluation Study, undertaken by the ODA, with the assistance of the London School of Hygiene and Tropical Medicine (LSHTM) in 1975. The study found, in contradiction of contemporary conventional wisdom, no difference in the pattern (epidemiology and

seasonality) of water-associated diseases in villages with and without improved potable water supplies. This was attributed to the fact that there was no difference in hygiene practices between the two groups of villages, which was indicative that most diarrhoeal diseases in Lesotho at that time were caused by poor hygiene standards and not by unclean drinking water. This led on to further work by the LSHTM to classify the different types of water-associated diseases.

Classification of Water-Associated Diseases and Appropriate Interventions

2.4 In the 1970s the different water-associated diseases were classified as follows by the LSHTM (see Box 1).

Where diseases can be water-borne or water-washed, eg the diarrhoeal group of diseases, LSHTM suggested that these be classified as faecal oral, in order that the categories are mutually exclusive.

2.5 Each broad category of disease requires a different type of intervention(s). The LSHTM matched up the most common water-associated diseases with the appropriate action to undertake. These fell into six broad groups - improving water quality; increasing water quantity/convenience; changing personal and domestic hygiene behaviour; improving food sanitation; improving wastewater disposal/drainage; and improving excreta disposal (Table 1 in Annex C refers).

2.6 Subsequent research has demonstrated conclusively that while the faecal-oral diseases can occur in water-borne epidemics, most endemic faeco-oral disease in poor communities is transmitted by water-washed routes.

2.7 The prime lesson is that improving water quality alone has minimal benefit to health, except in very limited circumstances. Guinea worm, which is solely a water-borne disease, can be eradicated by the provision of clean drinking water. Cholera, which is often transmitted by the water-borne route, can also be transmitted by the water-washed route. Its reduction, therefore, along with other faecal oral diseases requires more complex interventions: eg increasing the *quantity* of water people use, changing their hygiene behaviour (the importance of hand-washing after defecation being particularly important), having latrine systems that keep faeces away from earth, foliage, food, etc, with which people are regularly in direct contact.

1. Classification of Water-Associated Diseases

i. Water-borne - where the pathogens are carried *inside* the water supply and cause disease because they are drunk along with the water;

ii. Water-washed - where the pathogens are transmitted on fingers, food and so on, but where transmission will be reduced if water is easily available, and changes in domestic and personal hygiene behaviour reduce the level of exposure;

iii. Water-based - where a pathogen is present in the water and is transmitted by contact eg bathing in the water.

iv. Water-related - where vectors of disease eg insects, breed in pools of stagnant water.

2.8 A key issue, identified by the Liverpool School of Tropical Medicine, is that children generally defecate outside latrines, particularly when they have diarrhoea, and in the rains pathogens in their faeces cover the earth in a thin film, which goes onto their fingers and into their mouths. In many cultures, children's faeces are believed to be harmless, so educational interventions have to be designed that not only take account of the real constraints that people face in their daily lives in trying to avoid infections but also to change traditional beliefs.

Relationship between Consumption and Distance to Water Source

2.9 The Lesotho Village Water Supplies Study was the first to show that the relationship between consumption of water per capita and distance from water was not a simple linear relationship. It found that the closer the water source was to the household, the greater the use of water, *until a point* where it levels off. It was found that demand for water was constant over a range of about one kilometre, or half an hour round trip time, until water supplies were available in the house or back yard, when consumption rose sharply, by a factor of three or more. The existence of what is termed a "demand plateau" was subsequently confirmed by several other studies. The implication of its existence is that no increase in water use by households and, by extension, no increase in health-associated benefits, can be expected from simply moving people along this plateau.

Quantification of the Strength of the Link between Water and Health

2.10 A number of important studies have demonstrated the potential link between improved water supplies and better health. A major study by the Water and Sanitation for Health (WASH) programme, published in 1990, reviewed and analysed 144 epidemiological studies of the impact of improved water supply and sanitation facilities on six diseases. The study found that the health impact was high, as measured by significant reductions in morbidity rates and higher child survival rates. The median decrease in diarrhoeal diseases was 26%, ascariasis (an intestinal worm disease) 29%, guinea worm 78%, hookworm inconclusive, schistosomiasis 77%, and trachoma 27%. WASH warned that these figures could not be taken to apply in all circumstances, since many factors come into play in the relationship between an intervention and its impact, e.g. the success of the intervention, the overall health status of the recipients and the presence or absence of environmental factors that can help to reduce disease transmission. It was not possible to capture the fall in severity of cases, believed to be of great importance for some diseases studied.

(b) Policy Implications

2.11 WASH drew a number of lessons from its study on how to improve the design and implementation of water and sanitation projects (see Box 2).

2.12 Despite the accumulation of much knowledge, research has not informed policy on many vital issues. Chief among these were the maximum travel distance/time that will result in appropriate use of an improved water supply; the minimum quantities of water necessary to produce health impacts; threshold indicator levels at which water quality considerations override quantity in health impact and; how to define and measure proper hygiene behaviours and to identify appropriate methods for introducing and reinforcing behavioural change.

(c) Measuring Health Benefits in a Rural Water and Sanitation Project

2. WASH Lessons

- i. Health conditions *should* be considered when prioritising water and sanitation interventions.
- ii. It should be possible to target projects to particular population groups, and in many situations possible to identify appropriate interventions for those groups.
- iii. Safe excreta disposal and proper use of water for personal and domestic hygiene appear to be more important than drinking water quality in achieving broad health impacts.
- iv. Sanitation facilities should be installed in connection with water facilities where faecal-related diseases are prevalent. These should be culturally appropriate since *user preference* is important.
- v. Access to water supply should be as close to the home as possible in order to foster the use of *more* water for hygiene practices.
- vi. Water supply and health programmes should emphasize hygiene education to encourage people to use more water for personal and domestic hygiene.
- vii. Use of facilities is essential during critical seasonal transmission periods for such diseases as guinea worm which have such periods.

Difficulties in Direct Measurement of Health Benefits

2.13 There are serious practical and theoretical difficulties in measuring the magnitude of health benefits that may arise from a potable water supply and sanitation project. While health impact studies taken *as a whole* provide firm evidence that water supplies, excreta disposal and hygiene education can significantly reduce water-associated diseases, *individual studies* are beset with difficulties. Studies *either* compare the health of those served and not served by new facilities, *or* compare access to facilities by people with and without the disease in question. The results are confounded by the existence of contributory factors other than the perceived differences in health status. Households most likely to invest in a latrine or use a protected source of water are probably atypical in other respects, (wealthier, better educated than average, and more conscious of the benefits of hygiene). Hence those using improved water and sanitation facilities will tend to have less disease, whether or not the facilities have any protective effect. Although statistical techniques exist to control for confounding, they are only effective when applied to individual households and accurately measured.

2.14 The key policy implication is that health impact studies are not an operational tool for the "fine tuning" of interventions, or for ex post evaluation. Results from individual studies are too unpredictable. A more relevant question is how to maximize the potential health benefits of interventions. Health impact studies have largely neglected the *improvement* brought by new facilities. But their impact can only be fully evaluated against the baseline situation. It is both equitable and efficient to target

those whose water sources are furthest away or whose environment is most faecally polluted. Such target groups are also most likely to feel a need for water and sanitation and therefore most likely to pay for it. The related issue of effective demand for rural water and sanitation facilities is discussed in section (iii) (b) of this chapter.

Use of Proxy Measures for Health Benefits

2.15 In 1983 the World Health Organisation (WHO) produced guidelines for reviewing or evaluating the health benefits of rural water and sanitation projects. The starting point was that quantification of health benefits was a very costly, time consuming and difficult exercise, more suited to research studies than operational purposes. An alternative approach was advocated which measured *community take up of project facilities and associated changes in hygiene behaviour* as proxy indicators of the strength of health benefits occurring. Emphasis was laid on collecting simple measures to show (i) how efficiently a rural water and sanitation project is operating e.g. the number of new water points functioning (ii) how effectively these are reaching the target population e.g. proportion of households using the new water points rather than traditional water sources and (iii) changes in hygiene behaviour eg presence of soap and water close to latrines. For latrines the measures are the percentage of households with new latrines, and these latrines' hygienic standards (how efficiently they are functioning and the extent to which they are being used). A 1993 UNDP/World Bank study built on and developed this approach further (see para 2.19).

2.16 In 1991, on the basis of further experience, WHO narrowed down the key changes in hygiene behaviour most relevant to control of diarrhoeal diseases to (i) handwashing after defecation or handling young childrens' faeces, and before feeding and eating and preparing food, (ii) maintaining drinking water free from faecal contamination and, (iii) safer disposal of human excreta, particularly that of young children and people with diarrhoea. Knowledge of the conditions under which these behavioural changes will occur is still limited.

(d) Participatory Evaluation and Women's Involvement

2.17 In 1993 the UNDP/World Bank Water and Sanitation Programme published a key report entitled "Participatory Evaluation - Tools for Managing Change in Water and Sanitation" which drew on 15 years field experience in participatory development. This argued that *involving users in decision-making, goal setting, design and management, increases the chances that water and sanitation facilities will be financed, used fully and looked after properly*. The participatory planning approach makes it more likely that communities' felt needs are correctly identified. Unless the "felt need" for the product that an external agency is offering is strong, no amount of skilful marketing and participatory *processes* will succeed in motivating people sufficiently to use and look after the new facilities provided for them. Put another way:- "community *demand*

is the key determinant of whether an agency and a community can come together and stay together long enough to create an improved water and sanitation situation. *If alternative water and sanitation facilities are perceived as adequate, if other needs are more immediate, or if the level of service offered is less than what people want, written agreements between communities and agencies, training and mobilising efforts will be of little use*".

2.18 The report focuses on specific indicators, practical ideas of how data collection can be carried out and used for problem solving and taking action in a participatory way. There are very few documented examples of "pure" participatory evaluation in the water and sanitation sector but there has been a gradual movement towards participatory applications of conventional techniques, as well as the creation of new tools and techniques that can be put in the hands of local people. Examples are given of how participatory approaches have worked in practice in the field in UNDP projects. They show how criteria used by communities to classify a water point as good or bad overlap to a considerable degree with those of technical experts; how data recording techniques can be designed for use by local people, and still be acceptable to project management for monitoring purposes; and how field observations carried out by illiterate women led to the redesign of a project. An example from Bangladesh (see Box 3) illustrates how effective a simple but ingenious solution can be.

3. Bangladesh Example

The purpose of the exercise was to establish if social factors affected the use of a public water point. A woman observer, sitting near the source throughout the daylight hours, recorded the gender and age of people using a pump, and quantity of water drawn. For each pump stroke the woman transferred a stone from one tin can to another. As each can was filled a mark was made on a piece of paper and the process began again. The data revealed that siting pumps near public places reduced usage by women. As a result of the findings, new handpumps were located in areas more acceptable to women.

2.19 The UNDP/World Bank Technical Paper agrees that the best indicators of health benefits are changes in hygiene behaviour, but argues for *broader* indicators of project success and a *different style* of monitoring and evaluation. It groups indicators under the three broad headings of sustainability, effective use, and replicability. These incorporate earlier measures eg percentage of facilities in working order and in use, but the emphasis is on monitoring and measuring the *community's capacity* to operate and maintain the water and sanitation facilities, and on the *process of getting there*, in order to measure community empowerment and the process of change. These include indicators for e.g. communities' problem solving capacity, (ability to organise and mobilise resources, take initiatives, self-diagnose, resolve conflicts, and generate knowledge). The target is to optimise the involvement of women and marginalised groups in decision-making. Although soft data are more difficult to measure than hard data, e.g it is easier to measure the number of water points functioning than an increase in management abilities (or in knowledge and skills and in self-confidence

among women and men) this can be done. Ten main indicators and ways of measuring the 33 sub indicators which fall under them are given in the report (World Bank Technical Paper 207, see Annex B).

2.20 The main lessons learnt from the field use of the participatory evaluation framework are (i) different communities will find different indicators of greatest importance (ii) the relative importance of different indicators will change over time within a project (iii) gender differences can influence the chosen indicator of success (iv) indicators of success differ for community people, community leaders and project staff (v) communities have the ability to develop, select, monitor and evaluate those indicators which are of importance to them (vi) capacity building at the individual, community and institutional level is more likely to occur if it is a specific objective and indicator of success and (vii) to succeed, participatory evaluation requires the active support of managers.

(iii) Time Savings

(a) A New Paradigm

2.21 The second major benefit typically used to justify investment in rural water and sanitation projects is time savings. In contrast to potential health benefits these are normally perceived and valued by rural households. Two important discussion papers by the World Bank in 1987 and 1988, "Rural Water Supply and Sanitation, Time for a Change", and "Water for Rural Communities, Helping People Help Themselves" both emphasised that project success depended on giving people what they wanted, and that community involvement in project design was therefore essential. Both went on from there to argue that economic project appraisal be based on expected time savings, first because of the methodological and practical difficulties in measuring and valuing health benefits in quantitative terms; secondly because time savings could provide an insight into the likely take up of new rural water facilities; and thirdly because, typically, the economic value of expected time savings was high enough to justify the project's cost. The thinking behind this approach was then developed further by the World Bank, along with other donors.

2.22 By the late 1980s the World Bank, the Asian Development Bank, and USAID had begun to develop an alternative paradigm to guide the design of rural water supply projects. Their starting point was that the *fundamental importance of demand in the selection of appropriate strategies in the rural water sector had been virtually ignored* - that strategies were too supply-driven. This provided the impetus for a multi-country series of WTP studies from 1987 to 1990. These tested a new methodological approach, in the field, to determine the demand for different levels of service. It also advanced methods of quantifying the economic value of time savings, and, where applicable, financial cost savings, of new water supply projects. The approach was

extended in the 1990s to determining demand for differing standards of sanitation facilities.

(b) Willingness to Pay Studies

(a) Methodological Approach

2.23 The prime purpose of WTP surveys is to determine the number of target households that will switch to a new water supply system. This will depend on the type and level of service being offered, the price that will be charged (or contribution to operation and management (O&M) costs expected) and the alternatives available. They need to be complemented by other surveys to determine cost and time savings benefits. *Contingent valuation* surveys are used to estimate households' WTP for different service levels. *Revealed preference* methods are used to calculate the economic value of time savings, and any financial cost savings arising from the proposed new water facilities.

2.24 In contingent valuation surveys people are asked how much their household is willing to pay for new water supplies of varying service standards. It cannot be assumed that households will automatically switch to a cheaper source of supply. There may be (i) reluctance to make a firm commitment to pay a water utility a fixed sum every month, e.g. where demand fluctuates seasonally, (ii) mistrust of government's ability to provide a *reliable* supply, (iii) unwillingness to upgrade a rented property. Questions may be open-ended e.g. how much would you be prepared to pay, or specific e.g. would you be prepared to pay a particular price. In follow-on questions the prices are raised or lowered according to the respondent's previous reply. Experience has shown that data derived from these studies give broadly consistent and statistically significant results.

2.25 The revealed preference method of estimating cost and time savings from an improved water supply is based on observations of actual household behaviour. Data are collected on the daily round-trip time to traditional water sources by women and children. Time and effort spent in trying to identify all wet and dry season traditional water sources are well repaid, since women typically resort to wet season sources when these are close. The studies' findings contradict the "common misconception" that women's time savings have low economic value. Households implicitly valued women's time savings close to the market wage rate for unskilled labour in several cases. Where it is not possible to undertake a detailed analytical study of the value that households' assign to time savings, a quick informal survey of women's activities outside the home can provide sufficient data to estimate this.

2.26 Where households continue to use the same amount of water after the introduction of an improved water supply, then time savings will be directly related to the change in round-trip time. Where households increase their consumption of water, the implicit time savings on the additional water will lie somewhere between the difference between the old and the new round-trip time. There will also be additional health benefits from increased water consumption in the latter case.

2.27 Water vending, usually undertaken by men, is widespread in many rural areas. Where it exists it is clear evidence of demand for water. Financial cost savings from not having to purchase water from vendors (sometimes seasonally), are: first, the savings on satisfying existing levels of consumption at a lower cost and, second, the consumer surplus enjoyed by households on any additional quantities of water consumed from the new system. There is evidence that demand for water sold by vendors is highly inelastic, even when it costs households 20% or more of their income. This implies that the consumer surplus even on high cost water is very large indeed, far larger than that usually assumed in the appraisal of water supply projects.

2.28 Guidelines for conducting WTP studies, giving detailed advice on questionnaire design, survey implementation and data analysis were produced by WASH in a 1988 field report. Details of the WTP methodology are contained in interim Asian Development Bank Guidelines on the Economic Analysis of Potable Water Supply Projects (June 1995).

(b) Findings from WTP Studies

2.29 The WTP studies produced some illuminating insights into how to decide what level of service is appropriate for a particular community, and how it should be paid for. People have clear views on what standard of water service they want and value, (and may be prepared to pay very little for water from a public standpipe but a significant amount for a private connection). The widely used rule of thumb that held that 3-5% of household income was the most that people were able

4. WTP for Rural Water Supplies

- i. Poor households without good alternative supplies are often willing to pay much more, in both relative and absolute terms, than richer families with good existing supplies.
- ii. Time and monetary costs of obtaining water from alternative sources is a key influence on WTP for "improved" supplies.
- iii. Reliability of supplies is a major influencing factor.
- iv. Family characteristics, such as level of education, occupation and family size - thought to be related to the opportunity cost of time - will also influence the perceived attractiveness of improved supplies and affect WTP for different standards of service.
- v. In Chihota District in Zimbabwe, where water is relatively easily available from traditional wells, WTP is very low (0.5% of income).
- vi. In Newala District in Tanzania, where water is far distant in the dry season, WTP is quite high (8% of income).
- vii. In Ukundu, a small market town in Kenya, most households spend 10%+ of their income purchasing water from vendors in preference to fetching free water from a well, because of the high value they attach to their time.
- viii. Parana State in southern Brazil many households will pay virtually nothing for communal water systems but will pay 2% of income for private connections.

to pay for potable water was found to be based on no empirical evidence whatsoever. The percentage of its income that a rural household is willing to pay for potable water supplies varies widely, because income is not the primary determinant of such willingness (see Box 4).

(c) Policy Implications

2.30 The message from the studies is that *"if planners and donors are willing to spend the time and resources necessary to understand local water demand and supply conditions better, the outlines of a new formula for rural water supply policies can be discerned"*. The first step would be to collect data on demand so that a menu of level of service and financing options can be devised that is both feasible and sensible in the particular setting. The second step would be to involve households in choosing a particular level of service at a prescribed tariff (or O&M costs under community management arrangements).

2.31 The studies found that rural communities fall into four main groups, from which broad policy conclusions can be drawn (see Box 5). The classification is not meant to imply that communities can always be fitted into neat, rigid categories. Nor is it meant to be used *ex ante* to enable planners to categorise villages and prescribe appropriate policies. Rather it is meant to stimulate more careful thinking about the choice of appropriate policies.

5.WTP and policy implications

i. WTP (the full cost) for private house connections is high, but low for communal waterpoints. The majority of rural communities in Asia, Latin America and North Africa are probably in this first group. *Full cost recovery for private house connections is possible, with free water from communal waterpoints to protect the poor.*

ii. A few households are willing to pay the full costs of private house connections and the majority are willing to pay the full costs of communal waterpoints. The better off communities in Africa and the poorer communities in Asia and Latin America are likely to be in this group. *Full cost recovery is possible, but flexible payment systems may be needed.*

iii. Households' WTP for improved communal water supplies is high, measured as a percentage of income, but not high enough to cover costs, which are also high. Most sparsely populated communities living in semi-arid areas throughout the world are likely to fall into this category. *Since demand for improved water supplies is high, the policy conclusion is that they should be subsidised initially.*

iv. WTP for improved water supplies is low, (as a proportion of income), so that the project would not cover its operating costs. Communities with easy access to alternative free water supply sources, or who expect government to provide water free are likely to fall in this group. *The policy implication is that resources should be concentrated on areas where demand for new water supplies is higher.*

3. DONORS' EXPERIENCE IN THE FIELD

(i) Introduction

3.1 This chapter looks at the experience of key donors working in the field in rural water and sanitation projects. It demonstrates the gap between theory and practice that arises for many reasons, not least the practical difficulties of operating in the field. The findings reflect in part the experience and the philosophy of individual donors, but there are also many common findings. Donor evaluation reports drawn on are those of WASH/USAID, Danida, SIDA, FINNIDA and UNICEF. The ODA's experience is examined separately in Chapter 4.

3.2 Other donors' projects had mixed overall success rates. The most successful were those that had taken account of demand or felt needs for improved water and sanitation, as perceived by the community. Health benefits were generally smaller than foreseen in the majority of cases, due primarily to limited changes in associated hygiene behaviour, but also to malfunctioning of water points or their non-use by intended recipients. Many projects had significant time savings benefits, mainly benefiting women. The long term sustainability of many projects is at risk because inadequate attention was given at design to O&M, affordability and cost recovery issues.

(ii) Changing Perspectives Over The 1980s

3.3 In the early 1980s many projects had an engineering orientation, reflecting the widespread belief that the solution to rural water and sanitation problems lay essentially in technology. Donors gave high priority to *"refining and testing rugged handpumps for use in rural villages"*, and to designing *"suitable"* latrines for use in rural areas. But technology alone cannot now, and never could, solve rural water supply problems. Over the decade it came to be realised that the solution lay in bringing about social change and required the full participation of the communities involved. A consistent pattern of factors that made for a successful outcome began to emerge from donors' activities in the field.

(iii) Importance of Linkages Between Different Project Components

3.4 It is one thing to understand a concept and quite another to translate that understanding into effective action. For example, rural water supply and sanitation projects were consistently failing to have the health benefits expected of them in the 1980s when it was *"widely understood that water supply projects do not achieve their full impact unless they are first linked to hygiene education and then to sanitation"*.

3.5 The gap between theory and practice is partly explicable by the difficulty of establishing links between different local institutions, and designing and setting up hygiene education programmes which are culturally appropriate, effective and feasible,

given the often limited capacities of local institutions. For projects to be successful requires that a number of factors, some outside the direct control of project management, "come together". The local target community must be involved from the outset, project personnel must be able to work together for common goals, governments must find ways to coordinate the work of various, sometimes competing, ministries and money must be spent on activities that have no direct impact on increasing coverage. It is simpler to avoid "working out these complications and settle for sending in a well drilling team". If, however, the goal is improved health and sustainable systems, *there is no alternative to opting for the more complicated process of creating the necessary linkages.*

(iv) Health and Hygiene Education

3.6 The main benefit foreseen by almost all the rural water and sanitation projects reviewed was improved health. Yet projects were rarely justified on the basis of the comparative severity of associated health problems in the project area with those elsewhere. Nor were broad patterns of diseases established, and interventions prioritised and designed accordingly. (This parallels the ODA experience, see paras 4.10-12). Donors had difficulty in evaluating projects' health impact, because they lacked relevant baseline data. Very few evaluations used the WHO guidelines in a systematic way for measuring proxy health benefits (paras 2.14 & 15) or the World Bank/UNDP guidelines (para 2.18). The 1995 Danida evaluation of the Sri Lanka Rural Water and Sanitation Programme, for example, could only say that the project had "contributed" to the decline of diarrhoea in the project area. The 1993 SIDA evaluation of the HESAWA Rural Water and Sanitation Programme in Tanzania did not attempt to measure improvements in health and hygiene conditions or behaviour, but limited itself to the conclusion that it "may be very uneven". Only in the case of a guinea worm eradication project in Rajasthan in India, could a SIDA evaluation study link the intervention unequivocally with a sharp decline in the incidence of the disease.

3.7 At appraisal, it was often assumed that the major cause of water-associated diseases was unclean drinking water, and, at implementation a disproportionate amount of time and effort went into improving the quality of drinking water, at the expense of hygiene education and promotion of improved sanitation hardware. The increasing evidence from the mid 1970s onwards from field research (para 2.6), that increasing the *quantity* of water, to enable more water to be used for personal and domestic hygiene, was far more important than improving the *quality* of water for drinking purposes, was very slow to influence project design. The evaluation of Danida's Sri Lanka project, for example, found that contaminated drinking water had been assumed to be the main health risk "on the basis of no supporting evidence". Two of the ODA projects made a similar assumption (para 4.11 refers).

3.8 Sanitation projects have usually been accorded a much lower priority than water projects, by both donors and recipients, because they are intrinsically "more difficult". The view that improved sanitation may be more beneficial to child health than protected water supplies began to emerge in the 1990s, although there was not universal agreement among donors and researchers on whether health-associated benefits from water *depend* on sanitation improvement.

3.9 A 1994 UNICEF review of 54 sanitation projects found that these were mostly defined as the installation of hardware. While activities to change associated hygiene behaviour were increasingly being incorporated into project design, hardware remained "the dominant concern". Few projects differentiated between demand for improved sanitation facilities and that for improved hygiene practices. Where hygiene behaviour components were added it was to enable latrine construction to succeed. There was a *widespread lack of understanding of the complexities of changing hygiene practices*. Few programmes which aimed to change hygiene behaviour had surveyed hygiene beliefs and practices in the community prior to project design. Without such information it is not possible to modify existing patterns of behaviour or to discern if behavioural change had taken place as a result of project interventions. An exception was the highly successful Lesotho national sanitation programme which, by succeeding in changing peoples' beliefs about sanitation, created a high demand for latrines. At evaluation these were found to be well used and well maintained. The Danida Sri Lanka project also succeeded in creating a demand for improved sanitation facilities which, at evaluation, were being well used and maintained.

3.10 Sanitation facilities and hygiene education components were often not well integrated into rural water and sanitation projects, but were tacked on to the "the main programme". There were two main reasons for this. The first was project management's belief that "easy access to better and more reliable water supplies was the main step to improved health and well-being", which persisted well into the 1980s. It led Danida in 1986 to decide against integrating sanitation into its Rural Water Supply Programme in the Lake Region of Tanzania, and to abandon its earlier experimental participatory hygiene education programme, "because of the very great demands this placed on additional manpower, training, and coordination". The second reason was that, because the priorities and ways of working of the different institutions involved in rural water, sanitation and health are very different, tensions are likely. It is usual for the technically-orientated Water Departments to determine the pace of the project, often at the expense of the more community-orientated Ministry of Health's activities (see Box 11 for the ODA experience). Some of the most successful national sanitation programmes are those like Lesotho's, which have de-linked delivery of sanitation from that of water supplies, in order to allow sanitation to proceed at its own pace. There are also potential advantages in de-linking sanitation and hygiene promotion, to prevent the "hardware" message from drowning out the "software" message.

3.11 A 1990 WASH review of its experiences in the water and sanitation sector over the 1980s led it to draw the following lessons for increasing associated health benefits (see Box 6).

(v) Felt Needs/Effective Demand and Participatory Development

3.12 There was widespread concern among the donor community by the late 1980s over the failure of many rural water and

sanitation projects. The evidence was there in the form of high breakdown rates of water points soon after project completion, and in their often low usage, when they were functioning, by those for whom they were intended. Latrines in rural areas, too, were often not used or not used for the purpose intended. This led to the search for new paradigms which sought to establish conditions under which schemes would continue to function *and be used* after project completion. One, which stressed that projects were not reflecting communities' felt needs led to the advocacy of greater *community participation* in project design. The other, which saw that projects were supply driven, argued that the standard of service to be provided should also take into account effective demand, as quantified by WTP studies. While the 1980s and 1990s saw an increasing involvement of communities in the planning and implementation of projects, WTP studies remained a research tool until very recently.

3.13 Most rural water projects in the 1980s were designed to involve communities more fully in the management of their own water supplies in response to governments' budgetary problems, and the consequent need for greater community self-reliance. Village level operation and maintenance systems (VLOM) of rural water supply schemes became the norm. This made the designing of projects that reflected communities' real needs even more vital for project sustainability.

3.14 Most donors in the 1980s assumed that they knew what the felt needs of a community were, and used water shortages or long distances from water as proxies

6. Increasing health benefits of rural water and sanitation projects

- i. Installation of water supply facilities should invariably be accompanied by improved means of excreta disposal.
- ii. Development of facilities must be accompanied by hygiene education.
- iii. Hygiene education must be rooted in the community, utilising local trainers and accepted village practices.
- iv. Women, as family leaders in matters of health, must be involved.
- v. Hygiene education programmes are most effective where they are not the first point of interaction with the community, in order to allow time to build up trust.
- vi. Careful study of the attitudes, beliefs, practices and past experiences of communities is vital, in order to tailor hygiene education materials to the context in which they will be used.
- vii. Locally produced materials can be more effective than externally produced materials.
- viii. Local people are more acceptable and credible to communities as hygiene educators than outsiders. In most cultures it is more acceptable for the main hygiene educators to be women than men.

for felt needs, as in the case of Danida's Rural Water Supply Programme in Tanzania. This was often a reasonable assumption - the evaluation study found that most of the new village water points were being used. It was rare for a project to ask the villagers what their own priorities were. The SIDA project in Dodota District in Ethiopia was an exception, where a project emerged in response to its identification by villagers as meeting a top priority need (but it started life as a women-in-development project and not a water one).

3.15. Where projects did not reflect felt needs, facilities were underused. This was usually where the level of service had been determined by the donor on equity grounds. In Kenya, Danida provided a mix of individual household connections and communal water kiosks (from which water is sold) in its Rural Water Supply Programme, despite identifying a very low demand for kiosks at appraisal. At evaluation all kiosks had been closed down because households had connected to the piped water system. In its Rural Water Supply Programme in Sri Lanka Danida estimated "demand" at appraisal on the basis of an assumed ability (not willingness) to pay. The evaluation study found that most intended users had connected to the piped water system (outside the project). Only the "poorest of the poor" in the project area had not been able to afford individual house connections. In contrast, the sanitation component of the programme did reflect felt needs and latrines were heavily used and well maintained.

3.16 Although a widespread consensus exists that participatory development is the key to sustainable projects it has proved difficult to achieve this. In the 1980s community participation had a more limited meaning than it did in the 1990s. Then it typically meant *community contributions* to the construction phase of the project, (labour, materials or finance), and an expectation that the community would take over a major part of the O&M of the new scheme. Despite the intention of fostering a sense of ownership among communities in "their" project, villagers were normally presented with a standardised technical package on a take it or leave it basis. Danida, for example, in its Tanzania Rural Water Supply Programme, decided the choice of technology and level of service before consulting villagers on the number and siting of water points. Villagers were asked to provide voluntary labour for construction, and to establish VLoms for completed schemes. The SIDA Rural Water Project in Tanzania also offered communities a readymade package, with limited scope for negotiation and adaptation, as did several of the ODA projects evaluated (paras 4.5 and 4.7 refer).

3.17 Participatory appraisal techniques have sometimes been used to "extract information" rather than learn about villagers' perspectives. SIDA's Sanitation Water and Community Health Project (SWACH) in Rajasthan in India was conceived as an experimental project, with the aim of exploring how a grassroots-focused project could be implemented. The emphasis was to be on community participation and a "bottom-up" approach. The evaluation found that in practice a top down approach was taken

in a number of instances, leading to a divergence of interests between the project management's agenda and that of the communities. Women's main interest was with ways of improving their livelihoods and incomes, rather than personal hygiene and sanitation issues. Their perception of the women's groups set up by the project for the discussion of personal hygiene and sanitation issues was that these had been imposed on them and were not a reflection of their expressed concerns.

3.18. One of the very real difficulties with participatory development is how to strike an appropriate balance between prescription and choice. In the case of the SWACH project a tension arose between the competing demands of government's requirement for rigour and accountability and participatory development's need to retain openness and flexibility so that community

7. Dodota Rural Water Supply Project: Ethiopia

The project had its origins in a study on women in development by SIDA in Ethiopia in 1980. Peasant women in Dodota sub district, who spent 2-6 hours a day fetching water, identified lack of easy access to clean water as their main problem. From the beginning there was no project blueprint and no time schedule to follow, so allowing many people to influence the shape and content of the project. Women were trained to operate and maintain the communal water points, and to manage the overall scheme eg keep the books and collect the fees. There was continuous dialogue between the women and the technical designer of the project which led to some innovative adaptations to the standard design. This was one of the factors leading to a strong sense of ownership of the project. The project took six years from identification to its handing over to the local community.

priorities and capabilities could determine the direction and speed of events. This tension was resolved in favour of the former, as demonstrated by the measurement of concrete targets (products) rather than processes as the key monitoring targets. In contrast, the Dodota Rural Water Supply Project in Ethiopia was completely participatory in style, its pace and direction being solely determined by the community (see Box 7). The drawback to this approach is the uncertainty over the project's length of life, and the very long time taken to spend a relatively small amount of funds.

3.19 The 1994 UNICEF review of 54 sanitation projects concluded that while donors are convinced of the need for community participation in order to increase project success, participation was limited, in the majority of projects reviewed, to the construction phase and usually entailed a contribution of labour, materials or finance, rather than involvement in planning or management. Rural sanitation projects pose particular problems as demand for improved facilities is often low. In these circumstances there is a choice between trying to create demand for improved sanitation facilities - the preferred UNICEF approach, which sees it as stimulating latent demand - or responding to the demand that is there - the approach preferred by World Bank. Both agree that sanitation hardware requires greater adaptation to local preferences than water technology does, and that providing consumers with a choice of products is essential for success. It cannot be assumed that demand will universally be for low cost latrines - there is some evidence that in some cases low cost technology discourages demand. Successful interventions are more likely to resemble marketing than traditional service provision.

(vi) Sustainability

3.20 In reviewing its experience from the 1980s WASH argued for using *system sustainability at the national and community level as the basic measure of project success*. In rural areas the sustainability of water and sanitation systems depends ultimately on communities, who must use the services provided for these to have any value, while they have increasingly become responsible for O&M arrangements. The key to increasing the take up of services on a sustainable basis is to link community participation and hygiene education to facilities development the caveat being that felt needs and/or effective demand have been correctly identified (para 2.19 refers).

Institutional Sustainability

3.21 It is usually necessary to *strengthen government institutions* so that they can implement and co-ordinate water supply and sanitation programmes. This is best done by involving the institutions' staff actively at all stages, so that they are a part of the process, and more likely to be committed to the change. Institutional change is a complex matter, in which the role of long term advisers and regular project review workshops, calling on specific short term expertise, are pivotal. This may well require

constant revision to plans and strategies as events dictate, and constant monitoring of targets and achievements. The three key institutional factors underlining project sustainability are summarised in Box 8.

Technical Sustainability

3.22 Project sustainability depends on making the appropriate technology choice. The technology should be physically within the capability of those trained to operate and maintain the new water supplies. Hand-pumps for example are a good choice for VLOM because they can normally be maintained by bicycle mechanics after a relatively short training period, providing spare parts are easily available in rural areas. Ideally

8. Institutional Factors required for sustainability

i. Constant operational linkages between activities of specialised implementing agencies, (including urban and rural water supply and sanitation ministries to ensure that peri-urban areas are not ignored because they fit into neither's portfolio). Co-ordination of the technically more complex water supply activities, (which typically involve engineers and other specialists), with sanitation, (most commonly treated as a community self help activity), with hygiene education and its different set of skills.

ii. Formation of an inter-ministerial group to improve co-ordination between the different ministries involved, attended by high level representatives from the different ministries, and to improve resource allocation, policy and planning decisions. Over-arching co-ordination between government institutions is an even more vital need where countries have an increasing scarcity of fresh water.

iii. At community level, existing formal and informal institutions should be built on, rather than creating new institutional structures for the project. Village water committees should be legally empowered to enforce payments of water charges if cost recovery is to be achieved, especially on communal water schemes.

these should be locally manufactured. As a minimum, arrangements should be made to stock spare parts and tools in regional stores to ensure their accessibility to rural communities.

3.23 Building upon technologies that are culturally acceptable and have a proven record of success strengthens project sustainability. In Thailand, for example, where rainwater has been collected from rooftops for domestic use for thousands of years, simple improvements to this traditional technology (significantly reducing the risk of contamination), pioneered by the Asian Institute of Technology, are now being used by households. The community's technology choice must reflect its wishes and the commitment to the operation and maintenance of the new facilities is the key to project sustainability.

Operation and Maintenance

3.24 During the 1980s an increasing number of rural water supply projects had a VLOM component. Successful O&M arrangements underpin project sustainability and planning for O&M must begin at the design stage, when it can influence the technology choice. Realistic O&M plans *cannot* be tacked on as an afterthought, when it is usually too late to make them consistent with available resources and capacities. (The lack of clear O&M arrangements in place for the SIDA and Danida rural water supply projects in Tanzania was the major threat to their sustainability, see paras D7 & 49). It is usually necessary to fine tune O&M plans during the trial period of project implementation, before technical assistance is withdrawn, to allow communities time to adapt to their new responsibilities. Where some repair or maintenance tasks are beyond the capability that can realistically be created at community level, the private sector can, in some countries, provide the necessary back-up more cost-effectively than government (although attempts to use private traders to distribute handpump spares has had mixed success. Turnover in spares is small by comparison with capital locked up in them, causing many small traders to run down their stocks to zero and requiring government to step in to ensure the availability of spare parts).

Financial Sustainability

3.25 Too many rural water and sanitation projects gave insufficient thought at the planning stage to the way long term O&M costs would be met, with the result that they are not *financially sustainable*. If users pay something towards O&M costs this will increase their sense of ownership of (and responsibility for) the new system. The key to financial sustainability is of course to provide communities with the standard of service that *they want*, and donors should be wary of deciding the level of service ahead of time. SIDA's rural water supply project in Ethiopia had all the right factors in place for technical and institutional sustainability but because it had neglected to consider how longer term O&M costs would be met, overall project sustainability was

threatened (para D39). In contrast, Danida's Aguthi project in Kenya having planned O&M arrangements from the beginning, made it a project condition that water be metered and charged for, and was financially sustainable.

Environmental Sustainability

3.26 Finally, increasing demand for water arising from land use changes has begun to adversely affect potable water supply projects in some countries, eg in Bangladesh, increasing use of water for irrigation has lowered the water table and precluded the use of existing low cost technologies for domestic water projects. The lessons are that integrated water resources management will become critical to the long term sustainability of water resources, as *environmental issues* come to the fore, and that projects will become more complex. Forestry protection and afforestation components were beginning to be included in Danida's drinking water projects by the early 1990s.

(vii) Cross Cutting Issues

(a) Gender

3.27 In the 1980s it became the rule rather than the exception in water and sanitation projects for donors to focus on women (see Box 9). It was stressed that women were carriers of water, managers, users, family health educators, motivators and agents of change. A FINNIDA review of its progress towards integrating gender aspects into water and sanitation programmes found that for the most part women were targeted without the benefit of gender analysis. For example, hygiene education had been almost exclusively targeted on women, whereas men need to support and adopt improved hygiene practices, as well. It had been commonly assumed that women alone are responsible for domestic water use and sanitation at home. This "oversimplification of reality" had reduced the effectiveness of community participation, by failing to take account of the differences in decision making and the division of labour between men and women in local communities. It concluded that strategies had been primarily Women-in-Development (WID) specific, rather than gender specific, ie the aims were to improve the chances of project success and achieve concrete benefits

9. Increasing the Involvement of Women

Danida increasingly involved women in planning, implementation and O&M of rural water projects over the 1980s. They have been encouraged and enabled to take leading positions within water committees, be actively involved in siting of water points, decide on design and placement of washing facilities, organise voluntary labour, collect water fees etc. They have been trained as handpump mechanics and as hygiene educators. In Sri Lanka such voluntary female hygiene educators were very successful in mobilising the communities for latrine construction, reaching a coverage of 80%. There are, however, constraints on women's involvement. These include cultural resistance to women taking over traditional male roles and women's generally very heavy work burden.

for women, (improved health, time savings) rather than improve their status in rural society. The SIDA evaluation of the SWACH project in Rajasthan, in India came to a similar conclusion (see para D31).

3.28 The FINNIDA review also found that progress was often slow in moving from rhetoric to practice. In the Mtwara-Lindi project in Tanzania (see para D53) women's low participation in such programmes was identified as a problem in the early 1980s, but no action was taken by project management for seven years and systematic gender strategies took another two years to put in place.

(b) Poverty

3.29 In most projects the strategy for reaching the poor was primarily to provide communal water facilities and low cost latrines. The validity of the approach was not generally analysed at evaluation but findings from some evaluation studies shed doubt on its efficacy. UNICEF pointed out that there was some evidence that low cost sanitation technology discouraged demand in some circumstances, and that a more effective approach was to "find the right balance between cost and demand". Danida found that communal water points provided under its Sri Lanka Rural Water Supply Project were little used by poor households, who were prepared to pay for individual house connections. Only the "poorest of the poor" had not been able to afford to link to the piped water supply. Very few evaluation studies examined explicitly whether poorer groups within communities had benefited from the interventions. An exception was the SWACH project in India, where the SIDA evaluation reported that despite the project's stated intention to reach the most marginal areas, these had remained on the periphery of the project. Village sanitation schemes, for example, were restricted to the better off, more accessible villages with piped water supplies. Nor in individual villages had the poorest households been favoured. The site selection for water points had been overwhelmingly influenced by "prominent local people". Two of the ODA evaluation studies also commented specifically on the impact of the projects on the poorer groups (see para 4.39).

(c) Environment

3.30 Environmental issues were rarely covered in rural water and sanitation projects in the 1980s, but have become more visible in the 1990s, as competing demands for water have put pressure on water resources (para 3.26 refers). Another lesson is that as demand for water continues to rise, it will become increasingly important to get the price right. Part of getting the price right may include a tax on agricultural extraction in order to pay for the costs it imposes on domestic water consumption.

4. ODA EXPERIENCE

(I) Introduction

4.1 This chapter presents findings and lessons from seven ODA evaluation studies of projects in the rural water and sanitation sector, many of which parallel those from other donors. The format followed in this section reflects that of the ODA Evaluation Reports.

(ii) Background

4.2 The seven ODA projects evaluated span a period from the early 1970s to the early 1990s. Brief summaries of each are given in Annex E. The two earliest studies were more in the nature of research studies than the subsequent evaluations. The other five projects were conceived in the mid to late 1980s. Three of these (see paras E2, 3 & 5) were planned from the beginning as integrated rural water and sanitation projects with associated hygiene education components. The two earliest projects (paras E6 &7), and the first phase of a third project (para E1), had no hygiene education or sanitation components, (although the latter added these to its second phase). The last project (Para E4), which was a by-product of a very much larger irrigation project, had no hygiene education or sanitation components.

(iii) Identification, Design and Appraisal

Overall Approach

4.3 The projects were primarily engineering-led, with emphasis on the provision of infrastructure. Overall project objectives, however, required a wider approach. The strategy to be followed in health and hygiene by the integrated water and sanitation projects was very little developed at appraisal, in contrast to that for the infrastructure components. Communities were involved to a very limited degree in project design. Operation and maintenance issues were sketchily addressed. Very little attention was paid to gender, poverty or environmental issues. Projects were approved by ODA on assumed, but insufficient, technical, economic, social and health data, the validity of which were not confirmed.

Demand Issues

4.4 Projects were engineering-led and economic issues were hardly considered. Beneficiaries remained very shadowy figures at appraisal, entering the equation only in terms of numbers to be served per unit installations. It was assumed implicitly that communities would use new installations for all their domestic water needs, in preference to traditional sources, and that people's future consumption of water per head per day would be sufficient to realise health benefits. No data were presented at appraisal on baseline consumption figures of water, on seasonal differences in per

capita consumption figures, or water sources used. Where time savings were assumed to be a major benefit, there was little information at appraisal on time taken in the pre-project situation to collect water and the expected time to be saved post-project. There was no discussion of the effective demand for water in any form, or the implications for take-up and use and for project sustainability.

Technology Choice

4.5 The over-riding factor behind the choice of technology for water supplies was the wish to keep it relatively simple, and low cost, and within the capacity of villagers to operate and maintain. For sanitation similar considerations applied. Technology choice was justified at appraisal not in terms of cost-effectiveness and affordability, but, if at all, as a low cost solution. It was not apparent that the full range of technical options had been considered. A standardised package was offered to communities, even when a wider range of options existed. Communities were not consulted in the choice of technology.

4.6 In four projects the evaluation studies found that better technical options for improved water supplies had existed at appraisal, or that the designs themselves were not optimal. In the Nepal Eastern Region Water Supply Project a single reticulated system was provided for each population centre. The evaluation judged that it would have been more cost-effective (and sustainable) to develop traditional water sources serving small community groups in smaller centres and in outlying wards of larger centres. The Busoga Region Borehole Rehabilitation Project in Uganda could have exploited the potential for cost-effective protection of springs, shallow wells, and rainwater harvesting in the southern half of the project area but restricted technology to that of borehole rehabilitation. This was in part dictated by WaterAid's internal procedures in which there were separate budget headings for each technology. The Gurkha Welfare Trust Project in Nepal used water scheme designs based on standards developed in the 1950s, which were described at evaluation as "not entirely suitable for the conditions in Nepal". In the Sierra Leone Rural Water and Sanitation Project CARE chose shallow wells for all project villages. Field management inexperience in engineering design led to two serious design faults, the pulley mounting at the well head caused frequent fraying of the rope, and protruding reinforcement bars in the well casing caused frequent damage to the bucket, and both had to be replaced twice a year, increasing costs.

4.7 These four projects also contained a sanitation component, the Sierra Leone Project in a second phase. All standardised at the design stage on the choice of latrines. In the two Nepalese projects the choice was simple pit latrines, with the cost met by the householders. In Sierra Leone and in Uganda the decision was made to promote the more expensive Ventilated Improved Latrines (VIPs). In the former the intention seems to have been to subsidise them from the outset. In the latter the

intention was that costs be met by the householders, despite it being widely known by the late eighties that VIPs were not an affordable option for the poor (and many of the not so poor).

4.8 The Swaziland Rural Water Supplies Project and the Lesotho Village Water Supply Project, were concerned solely with improvements to domestic water supplies. The evaluation studies found that appropriate technology had been chosen in each case, defined as cost-effective and relatively robust. Alternatives had been considered, and the right economic and technical choices made, (although the Lesotho evaluation noted that significant cost savings could have been effected by using local drilling contractors). A range of different technical solutions were used in each project, as appropriate.

Operation and Maintenance

4.9 None of the projects gave explicit consideration at appraisal to how the villagers' O&M responsibilities would be developed. At the design stage the issue was seen as one of providing the right sort of technical training. There was no analysis of the overall system into which the village level O&M would fit and, critically, how the supply of spare parts would be assured.

Health Benefits

4.10 Expected health benefits were given as justification for all projects at appraisal. There was no description of the broad water-associated disease patterns in the project areas, (or comparison with other neighbouring areas to put these into context). There was no analysis of how shortcomings in existing water supplies, and in health and hygiene practices, affected the target population's health status. Projects varied in how they proposed to pursue this at the design stage, and in how they would attempt to measure resultant health benefits.

4.11 The Uganda and Sierre Leone projects both highlighted polluted drinking water as the major cause of water-associated ill-health in their project areas, on the basis of no supporting evidence. The appraisals did not mention existing sanitation facilities and hygiene practices and any adverse health impacts, or give details of proposed hygiene education strategies. The latter's strategy may be inferred from the fact that for nine years it regularly tested and chlorinated water from

10. Example of ODA Projects Following Mid 1980s Best Practice

The two Nepalese projects planned to

- assess the baseline health situation in the project areas and monitor changes attributable to the water and sanitation interventions;
- undertake preliminary assessments of health and hygiene awareness;
- integrate health and hygiene education into project design at an early stage.

project wells but did not promote any hygiene messages in villages with protected wells. In phase two, when there was promotion of hygiene messages, these were in line with contemporary wisdom ie handwashing after defecation, disposal of child faeces, food and hygiene. The former's sanitation component remained a minor activity, concerned mainly with latrine construction, and made very limited contributions to hygiene education. The Eastern Region Project identified the key areas for action, 18 months into implementation, as improved food management in the home, hygienic handling of food and post-collection care of water. The evaluation study found, however, that data collected on community health profiles became available too late to have been of significant use for the project's engineering component. The Gurkha project adopted a participatory approach to hygiene education. An example of best practice is given in Box 10.

4.12 The two earlier research projects were designed to test the hypothesis that clean water would reduce water-related diseases, one by health surveys (observational studies of disease patterns in villages with and without clean water supplies), the other by using records from local clinics in the before and after situation. Given the state of knowledge in the 1970s on the link between water and health, both were sensible contemporary methodological approaches. The high cost health survey approach resulted in new knowledge (see para 2.3); the low cost approach using clinics' records did not succeed because a consistent data series over the five year period required did not materialise.

Cross Cutting Issues

4.13 Water was assumed to be a basic need, which the project should satisfy. None of the appraisals highlighted how access of the poorest members of the community would be assured, (this was not ODA practice in the 1980s). The gender issue was not addressed at appraisal, although several projects tried to involve women in health and hygiene education early into implementation, and in borehole maintenance in the Uganda project. The Gurkha Welfare Trust project was the only one to address environmental factors, by identifying in its project design the need to take account of drainage and re-use of waste-water.

Community Participation

4.14 The projects did not adopt a participatory approach to the planning and design of facilities. This was not general ODA practice when the projects were evolving. The NGOs and the Gurkha Welfare Trust, (a charity, but grouped with NGOs for purpose of analysis), did not work closely with the communities in identifying and articulating their priorities. In Uganda the choice of technology (borehole rehabilitation) was decided by the NGO at the outset, which precluded working with communities to determine their preferred choice of water source(s). In Sierra Leone, an effort was

made from 1989 onwards to increase involvement of communities in the decision-making process, by consulting villagers on the siting of wells. In Nepal the project had used a succession of outside visiting engineers to undertake the main technical survey and design, (British Gurkha engineer officers and civil engineers from The Register of Engineers for Disaster Relief), who lacked the time needed, and the experience, to adopt a participatory approach.

Institutional Issues

4.15 None of the four later projects gave adequate attention to key institutional issues at appraisal: the capacity of the governments to undertake the role expected of them; how the necessary departmental linkages between water supply engineering, sanitation, and health and hygiene education would work; or the communities' capacity and willingness to play the part expected of them. There was a growing body of evidence by the late 1980s that close linkages needed to be forged between the different government institutions involved if the health component was to be successfully integrated into rural water supply projects.

(iv) Implementation and Monitoring

(i) Introduction

4.16 This section synthesises the experience of the four later projects during the implementation stage, with emphasis on the strategies adopted to integrate the various project components into a whole. (The two earliest projects were only concerned with the provision of water supplies). Advantages and disadvantages of using NGOs and the private sector in project planning and implementation are considered, drawing on the experience of other donors to put that of the ODA into context. Finally, the adequacy of the monitoring systems put in place for the four projects is assessed.

(ii) Implementation

Coordination of Project Components

4.17 Implementation was largely driven by the engineering component of projects, which dictated the speed and direction of events, and prevented health, hygiene and sanitation components from being fully integrated into the whole. This finding parallels that of other donors (para 3.10 refers). It was a consequence, in part, of the difficulty of coordinating a wide range of activities with diverse institutional arrangements which require different time frames to achieve optimal results. Rural water supply tends to be technically more complex from an engineering point of view than rural sanitation, which is often viewed as a community self-help activity, and they are usually undertaken by separate ministries. It is quicker and easier to construct new water

supplies than to change peoples' attitudes to hygiene behaviour and to generate demand for improved latrines. In some cases it was also due to the mistaken belief that improved access to clean water was the key to reducing water-associated ill-health. These points are exemplified in Box 11.

4.18 The Nepal Eastern Region project was more aware of the importance of linking hygiene education and sanitation to the water supply component than the Busoga project, but still ran into problems. The start of the health and sanitation components of the project were delayed by 18 months and there were *"some stresses in the relationship between the Department of Water and Sewerage (DWSS) and the Ministry of Health" (MoH)*. The evaluation report attributed this to the technical approach of the former and the community-orientated approach of the latter which meant that their priorities and criteria for progress and monitoring were *"rather different"*, and led to *"some confusion, lack of communication and disagreement during implementation"*. Also, because the DWSS was not responsible for health objectives and did not have an interest in this component, it was reluctant to accept the MoH, (and the health consultant's), role and involvement in a project it regarded as its own. In contrast, in the Gurkha Welfare Trust Project, also in Nepal, the technical work undertaken by British Gurkha engineer officers on the drinking water installations was coordinated satisfactorily with water quality surveillance and protection, sanitation and hygiene education and promotion activities provided by a UK environmental health consultant, since both fell under the supervision of the Gurkha Welfare Scheme.

Advantages and Disadvantages of Using NGOs

4.19 The WASH report (see the bibliography) cites three advantages of using NGOs. First, being apolitical gives them a greater acceptability to local communities and national governments. Secondly, being relatively small-scale they can mobilise and adopt new ideas more quickly than governments and so be an excellent vehicle for pilot projects that introduce innovative ideas, technologies or development methods. Thirdly, they tend to use indigenous staff very effectively and to give them proportionately greater responsibilities than do international donor agencies. The two disadvantages are that NGOS may lack the technical expertise needed for more

11. Busoga Borehole Rehabilitation Project in Uganda

The project's timetable was determined by the speed at which physical borehole rehabilitation work could be undertaken by the Directorate of Water Development's rig team. The original target of rehabilitating 60 boreholes a year was doubled in the second year, because the rig team substantially exceeded its first year target. This decision was made in the belief that it was an unqualified benefit to speed up access to clean water, with no realisation of the adverse implication for health benefits and for project sustainability. The Ministry of Health, which was responsible for setting up village level borehole O&M committees and for undertaking hygiene education training and sanitation construction, had to fit into this new timetable, and complete its activities before the rig team began work, when the original timetable was too short for it to do its work effectively. *It should have been the speed at which the communities could be mobilised, and hygiene education activities completed satisfactorily, that determined the speed of the rehabilitation work, not the other way around.*

complex projects and, despite close links with communities, may be inattentive to the need to strengthen local institutions and promote community participation. The latter may be the result of the “doing for” approach of disaster relief rather than the “doing with” approach that sustainable development requires. Conversely, UNICEF argued that NGOs are often better than governments at promoting local participation in low cost sanitation projects, where government local administrative structures are weak, and when NGOs have the sensitivity required for participatory programming.

4.20 Two of the ODA evaluation studies revealed a further advantage of using NGOs as project managers. Where national governments lack funds and organisation to reach isolated rural areas, NGOs may deliver aid more effectively than government departments. CARE operated at the local level in Sierra Leone in the 1980s, when the economy was in sharp decline and the Sierra Leone government was in disarray. Without CARE’s involvement there would have been no rural water supply programme in Moyambe District. The Gurkha Welfare Trust Scheme was able to overcome the logistical difficulties of reaching the Nepalese hill communities through its network of Area Welfare Centres in 23 districts, which gave “effective local service delivery in the rural areas.” Government lacked a similar local structure.

4.21 There is inconclusive evidence from the evaluation reports that the NGOs were quicker than governments in adopting new ideas. In Nepal, the approaches adopted by the Gurkha Trust in designing and implementing its rural water schemes were not discernibly more innovative than those adopted by the DWSS. Both adopted some elements of contemporary best practice. Government was more innovative than the Gurkha Trust Scheme in emphasising a participatory approach to hygiene education, while the Trust undertook a preliminary assessment of health and hygiene awareness and needs at a very early stage of project implementation. The Uganda evaluation report specifically commented on WaterAid’s lack of experimentation.

4.22 None of the NGOs was active in promoting *community participation* or *strengthening local institutions* during implementation. Health and hygiene promotion activities undertaken were in the spirit of informing and educating, rather than developing an approach together with local people in a participatory manner. Water and sanitation facilities were offered as a readymade package, with communities consulted on the location of new water points, and then organised into contributing labour and materials for construction. None of the NGOs paid enough attention to strengthening the villagers’ capacity to operate and maintain their new water source, even where this was identified as a major project objective.

4.23 The potential disadvantage of lack of *technical expertise* can be overcome by drawing on effective outside expertise, or not overcome by relying on inexperienced advice, (see Box 12).

4.24 It is not possible to state, on the basis of information in the evaluation reports, whether the NGOs gave *indigenous staff proportionately greater responsibility* than donors would have done. It is possible that the GWT with its network of regional offices and CARE operating in difficult economic and political circumstances may have done so.

A Role For The Private Sector

4.25 There is a role for the private sector in the planning and implementation of water supply and sanitation projects, where it is competitive, and for the non-formal sector, where it is already providing an effective service in lieu of, or in competition with, the public sector. Private sector firms may be able to meet the effective demand for goods and materials for the construction and maintenance of new facilities. Private sector individuals may be able to service and maintain the systems, although a regulatory framework needs to be in place and enforced, before some tasks are handed over. If the intention is to adopt a participatory approach this will be unfamiliar to private sector entrepreneurs.

4.26 Only two ODA projects involved the private sector in project implementation or in O&M of completed facilities. In the Nepal Eastern Region Project, water supply installations were designed and constructed by the Nepalese private sector under the supervision of UK engineering consultants. In the Uganda project, WaterAid helped to train and set up village mechanics as part of the three tier borehole operation and maintenance system, and fostered the development of a small latrine production unit in one village. The intention was that this would be commercially viable but it was still being subsidised at evaluation. The project rightly decided against the purchase of locally

12. Example of NGO Projects Relying on Outside Technical Advice

i. The GWT in Nepal relied on British Gurkha engineer officers and on expatriate civil engineers for the technical survey and construction of water installations, which produced structures of an adequate standard, and on a British health consultant for hygiene education and promotion activities, which were well focused and effective. Hygiene Promotion Teams consisting of three women and one man were guided and monitored by the health consultant on regular visits.

ii. CARE in Sierra Leone used a VSO volunteer to advise on the design of village wells. It had two basic design faults, one the arrangements for drawing water from the well, the other protruding bars inside the well. These meant that ropes and buckets had to be replaced every six months. CARE sought WASH's advice on health and hygiene promotion activities when it expanded its project activities to include these components. These were well designed but evaluation took place too soon after to determine if they would be effective.

manufactured handpumps for the boreholes because the price was substantially higher than their imported equivalent.

(iii) Monitoring

4.27 Project monitoring was based mainly on physical targets and project expenditures. More appropriate indicators of achievement would have been health benefits, (perhaps measured by proxy), time savings, the proportion of new water facilities in working order (and, equally importantly, in use), progress in achieving O&M systems etc. There was no monitoring of gender, poverty or environmental issues. Project monitoring lacked a desirable multi-disciplinary dimension.

4.28 The result of mainly monitoring physical targets was to draw attention away from other factors that underlay project success and sustainability. WaterAid for example, sent six monthly progress reports to ODA, covering numbers of boreholes rehabilitated each period and borehole user committees set up, and budget expenditures. Numbers of boreholes rehabilitated in each reporting period was the measure of project success for WaterAid and the ODA. When the opportunity arose to speed up borehole rehabilitation work, no consideration was given to its adverse impact on hygiene promotion activities or on the development of village level O&M capacity. The Gurkha Welfare Trust Project evaluation report made a related point by commenting that project performance should not be judged solely by meeting annual construction targets. It pointed out that more resources than currently allocated were required to ensure adequate hygiene and sanitation monitoring, and water quality monitoring.

(v) Impact and Sustainability

Introduction

4.29 The majority of ODA projects were judged at evaluation to have been partially successful. The main benefit foreseen at appraisal was improved health, so this section attempts to compare the health impact from each project by following the WHO Minimum Evaluation Procedures approach (paras 2.15 & 16) to highlight common findings. (This was only done by one evaluation study). It also compares time savings benefits from each project, examines cross cutting issues and prospects for sustainability.

Health Benefits

Proportion of Functioning Waterpoints and Proportion of Households Using Them

4.30 Some projects had non-functioning or under-used facilities, implying that these had not always met a felt need or effective demand. It was common to find that women were still using their traditional water sources to supplement water supplies from the new facilities over part or all the year.

4.31 A survey of all boreholes rehabilitated under the Uganda project carried out at evaluation found that only 34% of these were in regular and satisfactory use 3-5 years later ie yielding water at a moderate rate and used on a frequent basis. The technical reasons for their original breakdown were not examined at appraisal, nor had communities been consulted on whether rehabilitating a nearby borehole met a priority need. In two villages an in-depth survey using participatory techniques found that only 34% of the villagers were using the rehabilitated borehole, either because it was too far away, or because they preferred available spring water.

4.32 An inspection by CARE in 1991 of 168 wells built under their Sierra Leone project revealed that 42% were not in use. Households were said to be reluctant to meet the twice yearly cost of replacing buckets or ropes arising from the original design faults (paragraph 4.6 refers). Villagers interviewed at evaluation reported continuing to use traditional sources, such as streams and swamps, for their water use, in some cases to supplement well water, in others for all their water needs.

4.33 Visits at evaluation to four of eight water supply schemes in Eastern Nepal revealed that all were functioning, but that one third of taps on average were not working. The majority of households were using the new facilities for all their domestic water needs. The Gurkha Welfare Trust Project's custom of undertaking minor repairs and maintenance activities on earlier schemes kept its breakdown rates low and very few women had reverted to their previous water sources. The Swazi and Lesotho studies reported a relatively small proportion of water schemes not working. Neither stated if women were using alternative sources, although given the significant average time savings, this could be inferred to be on a small scale.

Changes in Hygiene Behaviour and Imputed Health Benefits

4.34. The Swazi and Lesotho projects, which had had no associated hygiene education or improved sanitation component, had no water-associated health benefits, because there was no change in hygiene behaviour. Two projects were thought to have led to moderate health improvements, (see Box 13) one, at best, to very limited health benefits, and the fourth was at too early a stage to know.

13. Health Benefits from the Nepal Eastern Region Project.

i. The positive impact on the health of the communities using the new water supplies was attributed to the effectiveness of the health and sanitation programme, (subsequently used by other aid agencies) which led to greater knowledge of the link between hygiene behaviour and disease and to the *putting of some lessons into practice*. It was observed that women frequently washed their hands and the inside and outside of the water container prior to filling, and that water containers in the home were normally covered. Food in the home was protected from flies. Increased bathing and clothes laundering activities were reported by many of those interviewed, due to the greater ease of water collection.

ii. The project had increased latrine coverage, although the evaluation was not able to estimate how much it had increased usage. While a *significant proportion* of latrines had fallen into disuse, their provision had reportedly resulted in a reduction of visible human excreta, especially in main streets.

iii. People reported health improvements as a result of the project. They claimed a reduction of 60-75% in cases of diarrhoeal disease, especially in children. Hospital reports showed a fall in diarrhoea associated with both bacillary and amoebic dysentery; the former falls when more water is used for personal and domestic hygiene and the latter when drinking water is cleaner. Reductions in scabies, especially among children, worm infestations and general skin complaints were also reported, and attributed to the new water supplies. Other health benefits reported by women were reductions in physical stress, (arm, back and chest pains were reduced in those who previously had used wells where water was raised by rope and bucket and fewer headaches from carrying water), and in mental stress (more time to spend with their children and on domestic activities).

4.35 The Gurkha Welfare Trust Project led to an increase in the volume of water available and some women reported that they now bathed themselves and their children more frequently, (their standard of cleanliness having been observed to be generally high). The project had improved hygiene knowledge and increased latrine coverage. Potential health benefits were likely to be reduced by shortage of water in the dry season in some schemes, and the high level of water contamination occurring between source and consumption, due to poor handling and storing of water in the home. There needed to be more follow-up to the health and hygiene programme for there to be a *sustainable* improvement in health.

4.36 The "preliminary assessment" of the Sierre Leone evaluation was that the project had a positive health impact after 1989, when hygiene education and subsidised sanitation components were added to it. This view rested mainly on women's *knowledge* of key hygiene behaviours, and on reported latrine coverage and use in 18 villages. All indicators were higher in villages which were included

in the project post 1989. This result must be treated with caution, as experience has shown that knowledge and behaviour may vary markedly. Women in both groups of villages reported using more water since the project well had been built.

4.37 In contrast, the Uganda borehole evaluation study found minimal positive health impact from the project. A Hygiene Behaviour Survey carried out in eight villages to ascertain actual hygiene practices concerning water transport, storage, home practices to improve water quality, cleanliness of homes and surroundings, personal hygiene practices and use of latrines found a high level of awareness of good hygiene practices, *but that actual practices did not reflect this*. An in-depth survey in two villages using Participatory Rural Appraisal Techniques (PRA) techniques revealed that where women were collecting more water they were not using it for bathing. Total household consumption of water was relatively low at around 13 litres per capita on average from traditional sources, rising to 16 litres per head where women were collecting water from the borehole. Data collected from women interviewed at 20 boreholes corroborated the low per capita consumption figure found in the village survey. The impact of the project's activities on latrine coverage was minimal.

Time Savings

4.38 Time savings are the other major benefit that typically arise from rural water supply projects. These varied widely between the projects. There were substantial time savings benefits from the Swaziland project, ranging from three and a half hours to 30 minutes a day per household in the six villages surveyed. Average time savings were lower in the Lesotho project, ranging from an average of 36 minutes to 72 minutes per household per day. Time savings were minimal in the Sierre Leone project, since traditional water sources were very close to the villages. In the Nepal Eastern Region project time savings were significant, ranging from an estimated 4 hours to 50 minutes per household per day. In the Gurkha Welfare Trust Project they were modest, but not quantified by the evaluation report. Time savings in the Uganda project were restricted to the minority of households who continued to use the boreholes. For these households time savings were substantial, perhaps several hours per day. Where better off households sent their sons on bicycles to collect water this reduced economic benefits, since children's time savings, by convention, are not counted as a benefit in cost benefit analysis.

Poverty, Gender and the Environment

4.39 These impacts were not covered in depth at evaluation, following the pattern set at appraisal. In the Nepal Eastern Region Project access to water was found to be *equitable*. In the Uganda Borehole Project poorer households were found to be allowed to collect water from a borehole when they were unable to contribute to its O&M costs, and to benefit from lower user charges, set by the community according to perceived ability to pay. Where boreholes were located in trading centres, traders had financed repairs in order to maintain the water supply, on the understanding that other users would reimburse them later.

4.40 None of the projects set out to focus on gender relations but all, to varying extents, took a WID approach ie integrating women into the project in their traditional roles. Women benefited from the projects where the time taken to collect water fell. The projects did not lead to any change in gender relations.

4.41 The projects had a minimal effect on the environment. This was not unexpected given the relatively small amounts of water extracted from ground water sources, and the use of surface water. No adverse effects were reported from wastewater produced by the new water schemes.

Sustainability

4.42 A common finding in the evaluation reports was doubt over project sustainability. In most cases communities were reported to have little sense of ownership of schemes, generally attributed to the lack of community involvement in project planning and design. Concern was universally expressed about the inadequacy of O&M arrangements for the water supplies, due to insufficient attention having been paid to this aspect of the project from the beginning. For example, in both the Uganda Borehole Rehabilitation Project and the Eastern Nepal Water Supply Project Users Committees ranged from fairly inactive to defunct, and those that operated did so at varying levels of efficiency. There was no routine maintenance of pumps, and a question mark hung over the communities' willingness to pay for long term O&M costs, and the projects' financial sustainability. The gap between knowledge and practice of improved hygiene behaviours, the tendency for the knowledge of health messages to fade over time and for latrine coverage and use to diminish when the project ended, illustrated unsustainability of health benefits.

5. HUMANITARIAN AID

5.1 This chapter presents key findings from the water and sanitation components of three humanitarian aid interventions, covering one man-made disaster and two natural disasters.

5.2 In the Rwandan refugee camps in 1994 cholera and dysentery were principal causes of mortality. Rough estimates suggested that twice as many people died of dysentery as cholera. Both are endemic in Rwanda and epidemics are virtually inevitable in conditions of very high population concentration where drinking water is obtained from open sources, is in very short supply, and sanitation facilities are grossly inadequate. Both are faecal-oral diseases - cholera is often (but not always) water-borne but dysentery is far more often water-washed than water-borne - and so able to pass from person to person where personal hygiene is constricted by water shortage. The cholera epidemic spread rapidly -in Goma Camp the outbreak peaked within a week of the first case being diagnosed, and 100% of the refugees were infected with cholera within 2-3 weeks. The response by relief agencies and NGOs to control its spread was to chlorinate the water supplies but, from the outset, logistical problems prevented the distribution of treated supplies to the whole camp population. Extreme water shortages and the breakdown of security in the camps forced donors into excessive reliance on intravenous fluids to treat cholera cases and the more effective oral rehydration was little used.

5.3 Much less effort and attention went into dealing with the large-scale excreta problem. A few agencies dug communal latrines and set up designated, managed defecation areas. There was some reluctance to work in this "unattractive but nevertheless vital sector". Delays in the provision of managed defecation areas and latrines were a major contributory factor to the high dysentery rates in the camps. It was not possible to establish subsequently whether the three essential elements of diarrhoeal disease control: improved public and personal hygiene; rehydration; and antibiotic treatment; were correctly balanced for greatest effectiveness. There was some evidence that the antibiotic treatment was hampered by insufficient testing of the resistance of different strains of dysentery to the traditional antibiotics used to treat them.

5.4 The main lessons drawn were that greater attention needs to be paid to the less glamorous, lower profile, sanitation component of the response effort, and that contingency arrangements need to be in place when large influxes of refugees are expected, to allow a prompt response to be made to cholera outbreaks. A further lesson is that while there is a consensus on the need to study existing conditions, culture and practices before undertaking a sanitation programme, little practical guidance is available on how to carry out the rapid assessment needed for this in an emergency context.

5.5 One component of the ODA's response to the 1991-92 drought in Mozambique, was the provision of safe water supplies in rural districts most affected by drought and in one peri-urban area. These involved the drilling of deep boreholes, under the expansion of on-going water programmes by UNICEF and CARE. The rains started before the drilling rigs arrived on site, and the boreholes had no impact on relieving drought-related water shortages. An alternative solution of deepening existing shallow wells would have been able to increase water supplies much more rapidly but this was not considered in time. The lesson drawn at evaluation was that timeliness should be the principal criterion of success in any project to relieve drought. The borehole drilling programme should have been appraised in the context of the long term, regular water development programme in Mozambique.

5.6 An important part of the ODA's relief and rehabilitation programmes in Bangladesh following the 1991 cyclone was the restoration of tubewell water supply. Support was also given to the provision of emergency water supplies, the distribution of water purifying tablets and to sanitation. The main findings and lessons drawn at evaluation were that the restoration of tubewell water was a major element in preventing a large scale outbreak of diarrhoeal diseases but treatment of cases was sub-optimal because failure to diagnose different types of diarrhoea led to inappropriate treatments. Health carers likely to be assigned to post-disaster work need training in the diagnosis of different types of diarrhoeal diseases and in strategies for their treatment. Water purification tablets were unnecessary as tubewell water is safe without additional treatment. The digging of pit latrines in relief camps and the burial of dead bodies and carcasses were effective in containing potential health problems.

TERMS OF REFERENCE**EVALUATION SYNTHESIS OF RURAL WATER AND SANITATION****1. AIMS**

To disseminate within ODA and other interests, the results of and lessons learnt from rural water and sanitation evaluations carried out by ODA and other donors; and thereby to help improve the effectiveness of ODA in its support for rural water and sanitation projects and programmes.

2. SCOPE OF WORK

2.1. The consultant should review donors' evaluation experience with rural water and sanitation projects and prepare a synthesis report summarising the main findings. The consultant shall carry out the following tasks:

- a review all previous ODA rural water and sanitation evaluations including the recent project evaluations in Uganda, Sierra Leone, Nepal and Indonesia, a proposed output to purpose review, and other available output to purpose review documentation; rural water and sanitation activities in emergency evaluations will also be reviewed;
- b review recent ODA project documents in the sector;
- c review evaluation material of key bilateral and multilateral agencies including the World Bank and the EC;
- d review the evaluation/review material of the IRC International Water and Sanitation Centre in the Netherlands and the Water and Sanitation for Health Project (WASH) funded by USAID; and
- e review the key academic literature on rural water and sanitation delivery and project appraisal, implementation, and review/evaluation.

2.2 The findings of the above review should be synthesised in a study to achieve the set aims, including specific consideration of:

- a. current best practice in appraisal methodologies;
- b. project implementation;
- c. the role of health education;
- d. experience in community participation in design, construction, management and maintenance;
- e. project monitoring, performance indicators, and impact assessment methodology;
- f. the relative strengths and weaknesses of implementation through government institutions, the private sector, NGOs and community-based organisations;
- g. ODA's cross-cutting issues: poverty, gender, and environmental impact; and

h. sustainability.

2.3 Other issues will be identified by the consultant in the light of the documentation review.

2.4 The focus of the report will be on deriving findings and lessons from evaluation material.

2.5 The work should be informed by current ODA, EC, World Bank and other donor policy relating to rural water supply and sanitation.

3. DOCUMENTATION REVIEW AND COLLECTION

3.1 The initial documentation search and collection will be undertaken by a research assistant within the ODA Evaluation Department. Relevant documents and literature searches will be sent to the consultant. The consultant will be expected to liaise closely with, and guide, the designated research assistant to ensure all relevant documentation for the synthesis study has been gathered. The decision about which information to collect and use will ultimately be the responsibility of the consultant.

4. REPORTING

4.1 The consultant shall prepare a draft report (approximately 40 pages) summarising the findings of the synthesis for initial comment and subsequent presentation to the PEC. The consultant will follow Evaluation Department's normal drafting and commenting process and revise the report as necessary in the light of comments received. An EVSUM will be produced.

4.2 A separate report on the quality of EC evaluation reports and their implications for EC aid effectiveness in this sector will be prepared.

4.3 The draft report shall be submitted and a final report at a time to be agreed with ODA

4.4 The work should be carried out in accordance with "ODA Evaluation Studies: Guidelines for Evaluators".

5. INPUTS

5.1 The time allowed for the consultancy including documentation review, report writing, and follow-up is 5 weeks (based on a 6 day working week). The elapsed time for the work will be 10 weeks. The start date will be on receipt of the core relevant documentation. This date will be agreed between the Evaluator and the ODA project manager. A budget for fax and telephone costs will be made available to the consultant.

EVALUATION DEPARTMENT
12 February 1996

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WATER AND SANITATION INTERVENTIONS BY BROAD DISEASE CATEGORY

Interventions for Disease Control

Degree of Importance of Intervention: *** high ** medium * low - negligible

Diseases	water quality	water quantity/ convenience	personal & domestic hygiene	wastewater disposal/ drainage	excreta disposal	food sanitation
Diarrhoeas						
(a) Viral Diarrhoea	**	***	***	-	**	**
(b) Bacterial "	***	***	***	-	**	***
(c) Protozoal "	*	***	***	-	**	**
Polioomyelitis & Hepatitis A	*	***	***	-	**	**
Worm infections						
(a) Ascaris, Trichuris	*	*	*	*	***	**
(b) Hookworm	*	*	*	*	***	-
(c) Pinworm, dwarf tapeworm	-	***	***	-	**	*
(d) Other Tapeworms	-	*	*	-	***	***
(e) Schistosomiasis	*	*	-	*	***	-
(f) Guinea worm	***	-	-	-	-	-
(g) Other worms with aquatic hosts	-	-	-	-	**	***
Skin Infections	-	***	***	-	-	-
Eye Infections	*	***	***	*	*	-
Insect transmitted						
(a) Malaria	-	-	-	*	-	-
(b) Urban Yellow Fever, Dengue	-	-	**	**	-	-
(c) Bancroftian Filariasis	-	-	-	***	***	-
(d) Onchocerciasis	-	-	-	-	-	-

* Vectors breed in water storage containers

Adapted from Benenson (9) & Feachem (unpublished)

Source: Asian Development Bank

ANNEX D

DETAILS OF OTHER DONORS' PROJECTS

(A) Danida

(i) Stated Objectives

D1 Danida has considerable experience in the water supply and sanitation sector. It assigns a high priority to water and sanitation within its aid programme, as a means of "contributing to *lasting improvements* in social conditions and of promoting better health for the poorest population groups in recipient countries". Its overall objectives (1993) can be summarised as (i) the provision of equal access for as many people as possible in poor areas to water supply and sanitation facilities, while safeguarding the environment for future generations (ii) relieving women and children of the time and energy-consuming burden of fetching water and (iii) ensuring health benefits (through behavioural change) and other socio-economic benefits.

(ii) Findings from Danida Evaluation Studies

D2 Key findings from Danida experience in the rural water and sanitation sector are based on three evaluation studies of individual projects and on their 1992 water and sanitation sector guidelines, which include information on the characteristics of a range of projects. Among the key lessons that emerge from these studies are the difficulties in operationalising the community participation approach; the difficulties in integrating sanitation and health and hygiene education into a rural water and sanitation project on a practical level; and the importance of taking account of demand in determining appropriate service levels. As the evaluation studies are not uniform in their format, the findings and lessons highlighted below are to some extent a reflection of this diversity of approach.

(1) Rural Water Supply Programme in Iringa, Mbeya and Ruvuma Regions of Tanzania.

(a) Project Objectives and Approach

D3 The main objective of the programme at appraisal in 1978 was to construct drinking water supply systems for 300 villages, in support of the Tanzanian policy to provide a source of clean, potable and dependable water within reasonable distance of every village. The approach proposed was to integrate sanitation and health and hygiene education into the whole, and to promote community participation and village level O&M of the finished water schemes. Despite the intention to follow a new approach, the programme had a strong engineering bias from inception in 1980 to evaluation in 1987.

(b) Main Findings*Integration of sanitation and health and hygiene into the programme*

D4 Studies undertaken at the planning stage on hygiene education and sanitation were never incorporated into the overall Water Master Plan, the reasons being, first, they were completed after the accompanying technical studies and secondly, the project management believed that "easy access to better and more reliable water supplies was the main step to improved health and well-being". The project experimented with participatory hygiene education techniques in a few villages, but chose not to expand this to other villages because of the "very great demands this placed on" additional manpower, training and co-ordination".

In 1986 the issue of whether sanitation should be integrated into rural water supply programmes was discussed at a project seminar. Opinions were divided and no progress was made on the sanitation side.

Community Participation

D5 Villagers' participation in the planning of their water supplies had been minimal because the choice of technology and the general service level had been predetermined by the project. Villagers were then consulted on the number and siting of water points. The village itself was chosen for inclusion in the project on the basis of observed water shortage and/or long distance from water, (which the evaluation study accepted as reasonable proxies for "a real felt need for an improved water supply"). Villagers' participation at the implementation stage was restricted to contributing voluntary labour for construction. The Village Water Committees were set up to be the pivotal element in the O&M of the completed schemes. Most were functioning inadequately at evaluation, despite the evaluation report's finding that village participation in planning and construction had created a sense of ownership.

Benefits

D6 The new facilities themselves were still in good working order and most were being used, although a significant proportion of households were still using rivers for bathing, with attendant bilharzia risks. Water consumption had risen very little. There had been no discernible changes in health or hygiene behaviour. There was no mention of time savings in the evaluation study.

Sustainability

D7 There were a number of question marks over project sustainability: in particular, the lack of "clear arrangements" in place for maintenance. The evaluation recommended that the village-based maintenance and cost recovery system be strengthened. Recommendations aimed at increasing ownership of the project included: strengthening community participation to give villagers greater choice eg they should choose the technology (in the full knowledge of the cost implications for themselves) and be offered additions e.g. washing slabs to the basic scheme, for which they would pay. To take these steps would require greater integration of community participation activities into those of the Department of Community Development. Finally, the evaluation recommended that more be done on the sanitation, and health and hygiene education side.

(2) Sri Lanka Rural Water Supply Programme

(a) Programme Objectives and Approach

D8 The objectives of this long running programme (1980 to 1984) were to improve the provision of rural water supply, sanitation and health education in two districts of Sri Lanka, and to strengthen relevant institutions. A three tier maintenance system was to be set up, with villagers responsible for some of the O&M responsibilities. The programme would follow a participatory approach to planning and implementation. (The evaluation study did not comment on the planning process as such).

(b) Findings

Demand and Sustainability

D9 Two key findings of Danida's 1995 evaluation of its long running (1980 -1994) Rural Water Supply and (in effect) Sanitation Programme in Sri Lanka, was that while the sustainability of the water component was in doubt because the standard of water facilities provided had not matched what consumers wanted, that of the sanitation component seemed assured, thus demonstrating that an effective demand for improved sanitation facilities can be created.

D10 A total of 3,300 water schemes were built under the programme; boreholes with handpumps predominated, but there were also hand-dug wells and piped water schemes. Households were unwilling to pay their share of O&M costs for the handpump schemes put in by the project but were willing to pay (WTP) more for water services of a higher standard. Many poor consumers already had house connections, (independent of the project), and were limiting their consumption to within the level of the lowest tariff, so making it affordable. The evaluation concluded that only the "poorest of the poor" in the project area have not been able to afford house connections. The reason why the project had provided too low a level of service (and was now suffering from the associated lack of financial viability) was that it had been supply-driven. (At appraisal, "demand" had been forecast on the basis of assumed *ability* to pay).

D11 In contrast, the 48,000 latrines were being generally used and well maintained by rural households, despite uncertainty expressed at appraisal in 1982 about consumer take-up of latrines. There had been user involvement in planning and implementation, and the assumption is that this led to the provision of appropriate and convenient facilities which, coupled with an effective sanitation education programme, had convinced households of the benefits of improved sanitation practices.

Health, Poverty and Technical Alternatives

D12 Three other findings are worth highlighting from the Sri Lanka project, because they are echoed in the ODA evaluation studies. The first is the difficulty found at evaluation in assessing the health impact, in the absence of adequate baseline data and health monitoring systems. It was assumed at appraisal that contaminated drinking water was the main health risk, without any supporting evidence. There was a decline in diarrhoea in the project areas, to which the project had been a contributory factor. The second is that the poorest *had* benefited from the project, thanks to the old traditions of not denying drinking water to people. Where project wells had been taken over and maintained by richer households, because of the lack of demand from the community for which they were intended, poorer neighbours were allowed to draw drinking water free of charge. The third is that the evaluation study found that there were alternative water sources in the project area that could have been developed at lower cost.

(3) Aguthi Rural Water Supply Project, Kenya

(a) Project Objectives and Approach

D13 The project's objective was to improve health and hygiene, improve dairying and vegetable production for some 68,000 small farmers in a densely populated rural area, and

reduce women's burden of fetching and carrying water. It was proposed to install a piped water supply using community labour. The project was implemented from 1980 to 1989, and evaluated in 1990.

(b) *Findings*

Demand and Sustainability

D14 The project demonstrated clearly that in some rural communities WTP for water is high enough to make individual connections financially viable, and that to provide a lower level of service only leads to under-used facilities. At appraisal it was found that demand for private connections was high, but the project decided to provide a mixture of household connections and water kiosks, on the grounds of equity. At evaluation all the water kiosks had gone out of use. Over 90% of households in the project area had household connections.

Community Participation

D15 A key factor behind project sustainability in its eventual form was that the community had, from the start, been actively involved in the project. Aguthi had a well-knit local community with a tradition of hard work and a long history of voluntary cooperation in working together on community activities (harambee). The community took the lead in moving the project ahead, and were then mobilised by their own Water Committees to supply the labour required for digging trenches for the reticulation system. (An estimated 400 person years were freely given). This was spontaneous community participation at its best.

Operation and Maintenance

D16 A second key factor behind project sustainability was that satisfactory arrangements for O&M were planned from the beginning. A project condition was that water be metered and charged for. The small cash crop farmers were willing and able to pay tariff levels that would cover costs because Aguthi was a relatively prosperous rural area.

Benefits

D17 The evaluation study was not able to quantify expected health benefits but found that the project had brought considerable benefits in the form of substantial time savings to women (up to three hours per day) and an increase in their status now that they were able to travel outside the home and take up new activities.

(4) Findings Drawn from a Wider Range of Danida Projects

D18 A summary of findings drawn from a wide range of Danida's water and sanitation projects, is given in the 1992 publication "Danida Sector Policies for Water Supply and Sanitation". These are generally in line with those set out in the 1990 WASH report on its experiences in the sector. They reiterate the importance of sustainability, and note the importance of community participation in all aspects of projects, from decision making, through physical implementation, to O&M of completed facilities, (the latter being the key to sustainability).

Community Participation

D19 Danida has found that community participation is unlikely to emerge spontaneously, but needs careful planning and detailed definition of tasks to be undertaken by the involved parties. In some projects this has involved the production of step-by-step guidelines on when and how to involve the local communities.

Gender

D20 Danida has given increasing importance over the 1980s to the involvement of women in planning, implementation, and O&M of new facilities. They have been encouraged and enabled to take leading positions within water committees, and to be actively involved in siting public water points, deciding on the design and placement of washing facilities, organising voluntary labour, the collection of water fees etc. Where it is acceptable to the local community they have been trained not only as caretakers but also as mechanics to maintain the handpumps of the new water supplies. Where sanitation and health education were project components, selected village women were often trained as agents in public health. In Sri Lanka such voluntary female health promoters were very successful in mobilising the communities for latrine construction, reaching a coverage of 80%. Constraints on women's involvement however, include cultural resistance to women taking over traditional male roles and the very heavy work burden, generally, of women.

Demand Factors, Cost Recovery and Affordability

D21 Danida acknowledges that many projects in the 1980s were "failures because the new water supply was not competitive with, or an improvement on, existing water sources", (but may still underplay the importance of demand factors in providing service levels that people want and will therefore use). Good progress was made on the development, promotion and acceptance of low cost water supply and sanitation technologies, such as handpumps and on-site sanitation disposal methods, which have reduced costs to a level that is "affordable" by most users. But Danida's experience is that there is still "no such thing as a simple and reliable treatment process for safeguarding the bacterial quality of potable water supplies".

D22 The proliferation of (Danida and other donors') poorly maintained and malfunctioning water projects, caused by lack of funds for O&M, underlines the lesson that cost recovery is essential for sustainable services. There is "overwhelming evidence that costs of water supply services must, in one way or another, be borne by consumers, so as to ensure adequate O&M and to provide finance for future expansion". (Danida do not draw the conclusion that where communities are meant to meet a high proportion of O&M costs and are unwilling to do so this can be read as another manifestation of lack of demand for project services).

Integrated Projects

D23 The 1980s saw a trend towards increasingly more complex projects. A typical project may now include water supply, sanitation, health education, environmental protection, communication, human resource development and research. Though Danida's experience with integrated projects is "rather limited" encouraging cases justify continued emphasis on this approach.

Sanitation

D24 Danida has found it necessary to subsidise latrine construction, since latrines are "generally low on the priority list of rural communities", but does expect a cash or labour contribution from benefiting families. Latrine use is promoted by determining the type of latrine which is culturally acceptable in a pilot project and by appropriate hygiene education. Danida does not say how successful it has been overall in promoting greater use of latrines on a sustainable basis.

Environmental Issues

D25 Environmental issues have become more visible, because increasing demand for water has begun to affect adversely potable water projects in some countries, e.g. in Bangladesh increasing use of water for irrigation has lowered the water table and precluded the use of existing low cost technologies for domestic water projects; in some coastal areas of Bangladesh and in Orissa in India it has disturbed the balance between fresh and salt water and led to saline intrusion. The lesson is that integrated water resources management is increasingly needed in order to ensure the long term sustainability of water resources. Forestry protection and afforestation components are increasingly being included in Danida's drinking water projects e.g. Sri Lanka, Tanzania, Niger, and Karnataka and Tamil Nadu in India.

(B) SIDA

(I) Introduction

D26 Key findings from SIDA experience in the rural water and sanitation sector are based on four evaluation studies. Two projects were highly successful in the sense of achieving their objectives and with good chances of sustainability. A third was highly successful in meeting its overriding objective and had substantial long term benefits, but at the expense of its other objectives. The fourth was not successful in meeting its objectives and its chances of sustainability were poor. The studies are particularly interesting in that each took a very different approach to planning and design and to implementation. The factor common to the successful projects was that improved water supplies met a real demand in the communities concerned. The differing methodological approaches of these three projects demonstrate that different circumstances demand, or allow, different strategies. The fourth project was operating in a much more difficult environment and was unable to create the demand needed for the facilities that it was providing.

(II) Findings

(1) The SWACH Project: (Sanitation Water and Community Health), Rajasthan, India

(a) Objectives and Approach

D27 The SWACH project ran from 1986 to 1995 and was evaluated in 1994. It began as an integrated rural water and sanitation project, narrowed its focus to that of guinea worm eradication, then widened into a community health project. It was conceived as an experimental project, with the aim of exploring how a grass roots-focused project could be implemented through cooperative arrangements between international donors, the Indian government, NGOs and the communities. Its emphasis was to be on community participation

and a "bottom-up" approach, with the active involvement of women. Its organisational base was to be that of a semi-autonomous institution, that would plan and co-ordinate implementation, which would be largely carried out by existing line departments.

(b) Findings

Successful eradication of guinea worm

D28 SWACH was highly successful in its containment and likely eventual eradication of guinea worm (a water-borne disease caused by drinking contaminated water) in tribal areas of southern Rajasthan. As a project with a single targeted objective it was therefore successful. But as a project with multiple objectives, including improved water and sanitation components, broader community health components, grassroots organisation strengthening and a more generic development focus, "the situation was less positive". The underlying reason was that the strategy required for eradicating guinea worm is radically different to that for a grassroots development project with wider health objectives. The former is geared to changing behaviour over a relatively short period of time. The latter works towards systematic shifts in attitude over an extended period of time, combined with significant changes in practices which are often not perceived to be priorities by villagers.

D29 As the project shifted its prime objective to that of eradicating guinea worm, field workers' tasks changed from facilitating the two-way exchange of views between villagers and project management to passing down project messages to villagers. These messages were reduced to three key ones - "filter your water" - "do not let a person infected with guinea worm go into an open well" - "use handpump water for drinking, where available". At the same time project resources were diverted from thousands of villages without guinea worm incidence and concentrated in 770 villages where guinea worm was present. The majority of new water supplies and newly established women's groups were in the 770 guinea worm target villages. The project was described by the evaluators as going on a war footing during this period of its life, and being akin to a national immunisation campaign. The enemy was about to be defeated at the time the project was evaluated.

D30 The technical strategy for eradicating guinea worm was highly efficient. It was innovative and concentrated on extracting the pre-emergent worm, treating the drinking water to break the transmission cycle, and supporting this with a highly active surveillance consisting of twice yearly searches, regular house visits by field workers and a system of rewards for cases reported. It was resource-intensive, with thousands of field workers involved, but it was effective. In 1993 the project effectively contained 91% of potential guinea worm infections. The official recorded figures for guinea worm cases in the project area was 5, compared with SWACH's estimate of 56 in the pre-emergence stage. The project therefore eradicated 51 of the 56 worms before they reached a stage when they could infect others.

Lack of Community Participation and Gender Approach

D31 The project did not adopt a truly participatory approach to planning; nor did it focus on gender relations within the project. Although the intention was to narrow the conceptual gap between what the villagers wanted and what the project thought they wanted, PRA was used to "extract information" rather than to learn about the villagers' perspectives. Women were the key target for project interventions, as the central role that they already played in water and sanitation was "understood, internalised and acted upon". But SWACH took the WID approach of essentially integrating women in their traditional roles into the project. The

emphasis was less on meeting women's needs than on viewing their participation *instrumentally*, primarily as a way to achieve better project functioning. Women, who were known to be more responsive to new water and sanitation facilities than men, would if they thought that these would benefit their families be prepared to put considerable resources, especially of time, in ensuring the project's success.

D32 The project initially (in its multiple objective phase) depended on village women to disseminate health and hygiene messages. (They were replaced with male field workers when the project emphasis shifted to guinea worm eradication). Female social animators were meant to initiate and mobilise support for project activities, build on messages delivered by the project during an initial period of intensive village exposure to key project messages, and form women's groups for discussion of personal hygiene and sanitation. The sustainability of these groups was in question as the women's expressed concern was not with health and hygiene, but with ways of improving their livelihoods and incomes. The lack of convergence between the SWACH agenda and women's own interests was a result of the top down approach taken to group formation, which had more of a social marketing than an empowerment approach. The women were viewed as passive recipients and not as active partners.

D33 The project was innovative in training women as handpump mechanics. This was seen both as an opportunity to challenge the gender status quo, and as making O&M arrangements potentially more effective. The project, however, did not follow through and where women were employed by local government, it was on much less advantageous terms than men, thus undermining the symbolic importance attached to training them in the first place.

D34 SWACH did not distinguish between the different interests of different groups of women, but treated them as a homogeneous group. Some of the less educated women reported that they were excluded from the decision-making in the women's groups. The evaluation concluded that it was not realistic to expect women's groups in a hierarchical society to be run on democratic lines.

Institutional Arrangements

D35 The institutional arrangements worked well in a number of respects. The project was small enough to facilitate close interaction among core members. The project co-ordinator was the Tribal Commissioner who was in the "singular position" to ensure the co-ordination of different government departments and had the authority to ensure compliance. The NGOs dropped out of the project when it became, effectively, a guinea worm eradication programme, as their experience of working at grassroots level in a participatory manner was no longer relevant. The experience gained under the project was primarily applicable to other eradication campaigns. But the Ministry of Health was not empowered to take on this responsibility, because training and human resource development had been task orientated and not geared to building capacity. A satisfactory balance was never achieved between government's requirement for rigour and accountability and participatory development's need to retain openness and flexibility to changing demands and opportunities. The tensions that arose between these two styles was resolved in favour of the former, as demonstrated by the measurement of concrete targets (products) rather than processes as the key monitoring targets.

Poverty and the Environment

D36 The project's stated intention was to reach the most marginal areas, but these remained on the project's periphery. Village sanitation schemes, for example, were restricted to the better off, more accessible villages with piped water supply schemes. Nor in individual villages had the poorest households been favoured. The site selection for water points had overwhelmingly been influenced by "prominent local people". The upside of this was that drainage improvements around handpumps was more likely where these were adjacent to the house of an influential family, and where it was in their interest too to maintain a clean environment and where investment in a vegetable garden or trees could be easily maintained.

(2) Dodota Water Supply Project, Ethiopia

(a) Project Objectives and Approach

D37 The project had its origins in a study on women in development by SIDA in Ethiopia in 1980. Peasant women in Dodota sub-district, who spent between two and six hours a day fetching potable water, had identified lack of easy access to (clean) water as their main problem. The project was conceived by SIDA as a women's project and the aim has been both the narrower one of meeting women's immediate needs and the wider one of improving their status in rural Ethiopian society. The intention was always to enable the women to take part in all the project's phases. The project is one of the very few found by the synthesis study of a donor responding to a need that was originally identified and articulated by the beneficiaries themselves.

(b) Findings

Community Participation and Gender

D38 From the beginning there was no project blueprint and no time schedule to follow, so allowing many people to influence the project's shape and content. From the beginning the project involved all the stakeholders in decision-making. It was perhaps fortunate that implementation, from 1982 to 1986, coincided with the villagisation programme, because this enlisted the support of the Ethiopian Central Planning Council for the project, and an active inter-departmental steering committee was established. Women were trained to administer and manage the project, e.g. keep the books, collect the water fees, and construct and maintain the pipelines, (but not the importance of financial viability and no adequate budgeting system was in place at evaluation). There was continuous dialogue between the trained women and the technical designer of the project which led to some innovative adaptations to the standard design e.g. preventative maintenance components such as leakage checks. The official handing over of the project to the recipient organisation gave it "the status of ownership".

Benefits

D39 The 1990 evaluation study was participative in style, basing its findings on the perceptions of the project beneficiaries. People reported that there had been substantial benefits from their new water supply. The consumption of water had increased, with stated positive impacts on health. Cleanliness was felt to have improved, and there was stated to be almost no diarrhoea, especially among children. The water was said to be much cleaner than the pond water they had previously used in the wet season, which had had to be filtered for worms. Some people were using the piped water for vegetable production and for watering

smallstock. Women appreciated the time savings, especially being able to spend more time with their children and to do their household tasks more satisfactorily. Many felt that they now paid less for water than before - some had had to buy water during the dry season, others had invested in donkeys and containers which had cost them more than what they were paying for water from the project. The female technicians employed on the O&M of the project were said to have been seen as role models for other women in the community. The evaluation could find no evidence, however, that women had become more active in community affairs generally as a result of the project.

Project sustainability

D40 All the right factors were in place for the project's technical sustainability - simple and durable technical solutions, well motivated and trained technicians, and local availability of necessary spare parts. The process of involving the women in the technical design of the scheme had helped to increase the chances of technical sustainability, and had increased their sense of ownership in the project, and their commitment to O&M. The weakness of the project had been in neglecting to consider how O&M costs would be met in the longer term. The evaluation study concluded that although the project was financially viable, in principle, as WTP for water was sufficient to cover costs, it was not so in practice, as the water tariff had been set too low to cover costs.

(3) Rural Village Water Supply Programme, Botswana

(a) Project Philosophy

D41 In stark contrast to the Ethiopian project, the Botswana programme took an engineering approach to the problem of improving rural water supplies, combining this with the philosophy that it was government's responsibility to supply water to the people. There was never any intention to devolve O&M to the village level, (and never any need, given Botswana's growing economic prosperity over the period in which the programme was on-going, from 1971-1993). The project's philosophy and approach were largely a reflection of its time. Many of the evaluation's findings, summarised below, also reflect characteristics of aid programmes of the same period.

(b) Main findings

D42 The evaluation, carried out in 1995, judged the programme to have been a success. The majority of the target population was enjoying a reasonably reliable water supply service. The supplies were highly utilised (by 96% of villagers in 12 sample villages). The major problem was that demand was higher than forecast in some schemes, leading to serious capacity constraints. The overall per capita cost was high, but this was a function of the difficult water supply conditions, and the project was cost-effective. The programme was financially, technically and institutionally sustainable. Environmental sustainability was uncertain, because of a "conspicuous lack of concern with water conservation".

D43 Long term institutional capacity was not undertaken until the mid 1980s, coinciding with an increasing emphasis on O&M. At the same time training objectives widened to cover all staffing requirements, to meet localisation goals.

D44 The project was highly relevant to the needs of village residents. Village water supplies had resulted in major time and drudgery savings benefits. Potential health benefits were probably small, stemming in essence from the Government's limited commitment to the Water Hygiene Education Programme, the consequent limited resources provided to this programme component, and the lack of coordination between the different departments responsible for the engineering and health education activities.

D45 Community participation had been minimal but overall this was judged to have been appropriate in the circumstances. Effective community participation would have required considerably more manpower resources than had been available in the relevant ministries at the time. The programme did not have any gender specific policies, and while women had been the main beneficiaries of the time savings, their increasing, but limited, opportunities as council water employees were due to national attitudinal changes and not to the project.

D46 The programme was financially sustainable, because the Government's budgetary situation was healthy; water supply had high political and social priority; and O&M costs represented only 0.7% of Government's recurrent budget.

D47 The major weakness was the programme's emphasis throughout on providing water to allow villagers to increase their consumption. Government's policy of subsidised water had stimulated the growth of private connections, itself the major contributory factor to water shortages in some villages. There was no attempt to use pricing to ration demand, which would have had the additional benefit of encouraging water conservation in a country where water is scarce.

(4) The HESAWA (Health Through Sanitation and Water) Programme, Tanzania

(a) Project Objectives and Approach

D48 The overall aim of the HESAWA programme was to improve the welfare of the rural population in the Lake Region of Tanzania through improved health education, environmental sanitation, drinking water supply, community participation and capability and capacity building at village and district level. Swedish assistance to the water sector in Tanzania began in 1965. By 1985 there was "very little to show for the investment made over the previous 20 years", and SIDA drew the conclusion that a change in direction away from dependence on free government services in rural areas towards community self-reliance was required. The cornerstones of the programme were therefore active community participation in decision-making, planning and implementation, and human resource development. Development priorities were to be set by the villages, with planning assistance from the Ministry of Community Development. District technical departments' role was to advise and support the villages. A basic goal was that the water, sanitation and health facilities constructed through the programme be operated and maintained to the fullest extent possible by the villagers themselves. Technology should therefore be both robust and reflect the communities' preferences.

(b) Main Findings

D49 The evaluation attempted to measure both products and processes achieved by the project.

D50 An estimated 20% of the rural population in the project area had been reached by improved water supplies at evaluation in 1993, although 30% of the shallow wells and 70% of improved traditional water sources inspected by the evaluation team in 24 villages were inoperative. There was no O&M system in place (after seven years). The project had still to decide on the most appropriate system for selling spare parts to villagers, who were themselves unclear about their responsibilities within the O&M system. Villages had not established procedures for operating and making regular contributions to the village HESAWA account. No real consideration had been given within overall planning of the programme to where responsibility for rehabilitation and replacement costs would lie, although handpumps installed at the beginning of the programme would soon need to be replaced.

D51 Improved latrine coverage had only reached an estimated 0.2% of the population, and was "not integrated into the mainstream of programme operations". The project experimented with different technical solutions, but all were thought too high cost by villagers, for whom better sanitation facilities ranked low on their own list of priorities.

D52 The evaluation study did not attempt to measure improvements in health and hygiene conditions throughout the project area but concluded, on the basis of a village study, that it "may be very uneven". The effectiveness of village level training in support of health, sanitation and water supply components of the programme was very hard to assess because many of the cadres had "yet to be really put to the test". The training at district and regional levels had succeeded in shifting the attitudes of government officials towards acceptance of more appropriate technology choices and had inculcated a relatively high level of understanding of the community-based approach. But attitudes still needed to change further, especially at district level, if further decentralisation were to be achieved. The gender agenda was perceived by Tanzanians as having been imposed by SIDA.

D53 The verdict on the success of the new approach itself, in particular community participation and bottom up planning, was mixed. While communities were involved far more than in the past, they still had "little real choice" in the options offered by HEWASA. Communities were offered, in effect, a readymade package, and there was limited scope for negotiation and adaptation. Their real choice was that of the veto. A further factor which had hindered the concept from being put into practice was that the high level facilitating capacity required among implementors was still being developed.

(C) FINNIDA

Gender Aspects of Water Supply and Sanitation Programmes

D54 FINNIDA undertook a review in 1993 of its progress towards integrating gender aspects into its water supply and sanitation programmes and analysed the lessons learnt from ten years of experience. Its overall finding was that it had achieved progress in making WID rather than gender analysis an essential ingredient of its water and sanitation projects that involved community participation. Progress had been slow in moving *from rhetoric to practice*. It traced efforts made in the Mtwara-Lindi Water Supply Project in Tanzania to involve women in project activities in order to increase the likelihood of project success. An early project review in 1984 had found that women's participation in planning and implementation of the project had been very low and the proportion of women trained by the project minimal. Little was done to increase the participation of women in the project until seven years later, despite the repeated recommendations of monitoring missions. By 1993, systematic strategies for

Involving women were being put in place but these were WID rather than gender strategies. I.e. the aim had been to achieve concrete benefits for women (improved health, time savings). The lesson drawn was that it would have been preferable to address the equity issues I.e. to seek to improve women's status in rural societies, through involving them on equal terms to men.

D55 In the 1980s it became the rule rather than the exception for donors to focus on women in water and sanitation projects. It was stressed that women were carriers of water, managers, users, family health educators, motivators and agents of change. Given this recognition, women were targeted for health and hygiene education, trained to operate and maintain handpumps and were included in project documentation as primary beneficiaries. For the most part, women were targeted without the benefit of gender analysis. For example, hygiene education almost exclusively targeted women. Yet men need to support and adopt improved hygiene practices as well. A review of a FINNIDA water supply programme in western Kenya found *"strong reasons for believing that it is an oversimplification of reality to assume that women alone are responsible for domestic water use and sanitation and hygiene at home"*. It was important to know how men use water so as not to disregard inadvertently their participation and responsibilities for hygiene education and water supplies. Gender analysis would have helped to diffuse stereotypes and unwarranted assumptions about men and women. A gender approach to water supply and sanitation projects would have enhanced the effectiveness of community participation by recognising the differences in decision-making and in the division of labour between men and women in the local communities.

D56 The lessons learnt from the review on gender were (i) that if women are not explicitly mentioned in project documentation, they are often overlooked (ii) project data need to be disaggregated by sex (iii) the two most essential places in the project document to include gender considerations are in the performance indicators and the TORs of personnel, consultancies and project reviews and (iv) gender analysis should be conducted -it should not be assumed that women have primary responsibility for water, without regard for men's participation.

(D) UNICEF

Sanitation Projects

D57 In 1994 UNICEF reviewed 54 sanitation projects undertaken by itself and other donors to analyse experience in designing and implementing sanitation interventions in developing countries and draw lessons for improving their future effectiveness. (It excluded documents focusing on the impact of hygiene education, because a concurrent review of that subject was being conducted by WHO). The review was a forerunner of UNICEF's sanitation guidelines, a first draft of which was produced in January 1996.

D58 The review argued that improved sanitation conditions are more beneficial to child health than improved water supplies and that benefits from the latter are conclusively demonstrated only when sanitation is improved. In contrast, the review found that sanitation has not been accorded the same importance as water supplies by donors or recipients. This is partly because a number of characteristics of sanitation programmes makes implementation particularly difficult. First, the demand for sanitation among target populations, which is central to project success, is often low. A World Bank review of ten case studies noted that *the most fundamental lesson to be drawn from low cost sanitation programmes of the 1980s*

is that success or failure and rates of progress are determined principally by consumer demand. Success requires individuals or households to make a significant commitment, by agreeing to modify their homes or adopt new technology. The lessons drawn by the UNICEF review were that a successful intervention is more likely to resemble marketing than a traditional service provision. Because latent demand for sanitation, unlike health care, must be stimulated, successful interventions are those that have an understanding of, and contact with, beneficiaries at every stage of investment, and have found a way to balance demand stimulation with meeting that demand. When sanitation efforts have gone astray, it has often been for "lack of effective coordination among the different programme elements e.g. building latrines faster than demand merits".

D59 There is still some disagreement among donors about whether sanitation programmes should respond to demand or create it. The World Bank advocates the former line, UNICEF the latter. The World Bank also argues that increased access to improved sanitation for middle income groups is not only cost-effective but also benefits the poor by establishing a sustainable sanitation system that reduces disease transmission and environmental pollution, and encourages demand creation through demonstration and stimulating poorer groups to design their own solutions to sanitation problems. UNICEF's mandate is to assist (i.e. target directly) the neediest segments of the population. Its new Sanitation Guidelines, while advocating that sanitation services be targeted at high risk, under-served groups, do, however, recommend that new latrine options be introduced through slightly wealthier, higher status people in the community, because community members expect them to be the ones to take risks and be the first to try new things.

D60 Adapting technology to particular circumstances was found to be a critical element of project success. Sanitation technology requires greater adaptation to local preferences than water technology does. Again the consumer plays a central role. It cannot be assumed that demand will universally be for low cost latrines. There is evidence that, in some cases, low cost technology discourages demand. The key to success depends upon finding the right balance between cost and consumer demand, between capital investment, O&M and consumer demand, and allowing sufficient time for technology development and adoption.

D61 While donors are now convinced of the need for community participation in order to increase project success and sustainability, in the majority of projects reviewed participation was limited to the construction phase and usually entailed a contribution of labour, materials or finance, rather than involvement in planning or management.

D62 Another critical factor for success was found to be the choice of implementing agency. Programmes implemented by government agencies were generally less successful than those by NGOs. There were few examples of the private sector being involved, these being mostly with construction.

D63 The most successful projects are those like Lesotho's national sanitation programme, established in 1983, which is a model of integration of well-tested technologies, community involvement and innovative organisation and management styles. Government now plays a largely organisational and facilitative role, having successfully integrated the private sector and community groups into programme implementation, de-linked from water supplies. *Health education and the involvement of women are the basis of the strategy.* The high demand for latrines and the good maintenance levels are attributed to changes in people's belief about sanitation and an increased sense of ownership from participation. The cost of a VIP latrine

was just less than the average monthly income, which did not adversely affect overall demand, but did probably deny people in the lowest income groups access to improved sanitation facilities.

D64 The importance of changing hygiene related behaviour for improving health is now widely recognised among sanitation programme planners. The review found that sanitation programmes nevertheless continue to be widely defined as the installation of hardware, and while education and behavioural change are increasingly being incorporated into projects, hardware remains "the dominant concern". Most projects do not yet differentiate between behaviours associated with the demand for sanitation facilities, and those associated with health and hygiene practices. *"They may add a behavioural component, but only to enable latrine construction to succeed"*. Projects and evaluators generally betrayed a lack of understanding of the complexities of altering hygiene practices. Most programmes with a behavioural component had not surveyed hygiene beliefs and practices in the community prior to project implementation. Without such a survey it is not possible for health education to modify effectively existing patterns of behaviour, or to discern whether any appropriate behavioural change has taken place as a result of project interventions. They had also assumed, without justification that women were the key group to target, whereas the men's role, e.g. in latrine construction, was vital to project success. The review concluded that the conditions for successful behavioural change were fourfold - having a clear sense of purpose, making use of participatory techniques, including women as promoters/educators, and employing simultaneously a range of techniques.

DETAILS OF ODA PROJECTS

General Description of Projects

E1. The **Moyambe Rural Water Supply and Sanitation Project In Sierra Leone** began in 1980 and was evaluated at the end of 1991, when it had covered some 200 villages. Its stated purpose was to reduce morbidity and mortality in rural communities caused by poor domestic water facilities and hygiene practices. Potential time savings from more convenient water supplies were never a project aim. The major planned outputs were protected village wells, and, from 1989, improved hygiene behaviour and improved latrines in the same villages. The project was implemented jointly by CARE and the Sierra Leone Ministry of Energy and Power. ODA contributed £123,000 to project costs in 1989/90, and committed a further £475,000 for continued project operations to 1995.

E2 The **Busoga Region Borehole Rehabilitation Project In Uganda** was implemented over three years from 1989 to 1992 and evaluated in 1995. Its implicit purpose was to provide adequate quantities of clean and convenient water on a sustainable basis to 120 rural communities in three districts of Uganda. A secondary aim was to promote improved hygiene practices and greater use of improved sanitation facilities in order to reinforce the potential health benefits from improved domestic water supplies. Time savings were an expected, separate, benefit. The major planned outputs were rehabilitated boreholes equipped with handpumps suitable for village level operation and maintenance (VLOM), and the parallel establishment of village level borehole management committees. Supporting outputs were stated to be the construction of improved latrines and changes in rural communities' hygiene behaviour. The project was implemented jointly by WaterAid and the Uganda Government's Directorate of Water Development. ODA contributed £236,000 to the project.

E3 The **Nepal Eastern Region Water Supply Project** was implemented over five years from 1984 to 1989 and evaluated in 1992. Its implicit purpose was to provide adequate supplies of safe water to 16 rural communities whose traditional supplies were far distant, (and to one hill town), in order to improve health standards and reduce time spent by women collecting water. Planned outputs were the provision of (mainly) public tapstands in the villages, and associated pumping and storage works, one town water scheme and village communities trained in operation and maintenance. Other planned outputs included improved community hygiene behaviour, such as greater use of improved latrines. The project was implemented by the Nepalese Government Department of Water Supplies and Sewerage, with Binnie and Partners having overall responsibility for the management of capital funds. ODA met 100% of the capital and TC costs of the project, estimated at £3.9 million.

E4 The **Madura Groundwater Irrigation Project, Indonesia** ran from 1972 to 1990 and was evaluated in 1992. Its original purpose was to provide irrigation for the intensification of rice production. As farmers were unwilling to convert from rainfed to irrigated rice production, the emphasis changed to the promotion of irrigated high value cash crops. The major project output was 126 tubewells, at a cost of £26 million. The need for domestic water supplies was identified in a 1977 study and in phase two, (1984-1987) 10 wells for domestic water supply were developed. In phase three (1987-1992) a further 30 wells were developed and 60 existing irrigation tubewells were adapted to include a domestic water component. The EC funded the cost of adapting the tubewells at a cost of ECU 1.4 million. There was no associated sanitation or health and hygiene education component within the project.

E5 The **Gurkha Welfare Trust Project, Nepal**, which ran from 1989 to 1995 was evaluated in 1994. Its purpose was to improve health and living standards for needy hill village communities in traditional Gurkha recruiting areas of Nepal through the provision of clean water, the introduction of latrines and hygiene and sanitation education. The major project output was the construction of small gravity-fed drinking water systems in 90 villages (public tapstands) and the development of community capacity to maintain the new systems. Subsidiary outputs were latrine construction, putting a system of water quality surveillance in place, and hygiene education to change hygiene behaviour. The project was implemented by the Gurkha Welfare Trust. ODA contributed £1.4 million to the cost of the project.

E6 The **Swaziland Rural Water Supplies Project** was implemented from 1977 to 1981 and evaluated in 1982. The ODA approved £0.8 million towards a programme for the provision and improvement of village water supplies throughout Swaziland to be carried out by the Swaziland Rural Water Supply Board, with a major staffing contribution by CIDA. Benefits were expected to take the form of improved health and time savings. Major project outputs at the time of evaluation were 25 completed piped village water supplies and 10 partly completed supplies. There was no planned development of community capacity to assist with operation and maintenance of the village water supplies, nor did the project include a health and hygiene education programme or an improved sanitation component.

E7 The **Lesotho Village Water Supplies Evaluation Study** was an in-depth analysis of Lesotho's self-help village water supply construction programme covering the period 1966 to 1975. Its purpose was to make recommendations for future strategy in the rural water sector. This path-breaking inter-disciplinary study, undertaken in 1976, produced a number of seminal findings, notably identifying the need for an associated health programme to realise health benefits, and for appropriate institutional arrangements to ensure sustainability of rural water supplies. It also discovered the existence of a "demand plateau" for water i.e. per capita water consumption was constant over a distance of 30 minutes from the water source until it was in the backyard. ODA did not make use of these lessons in its appraisal methodologies and project design parameters until much later.

Overall Success Rating of Projects

E8 Evaluation reports produced by ODA Evaluation Department are required to give an overall success rating to each project. There is a standardised five point success rating system, (highly successful, successful, partially successful, largely unsuccessful and unsuccessful). Four projects on which this synthesis study is based were rated on the basis of this system. Two were classified by the evaluation reports as partially successful (defined as some objectives achieved and with some significant benefits in relation to costs) with one project classified as largely unsuccessful (very limited achievement of objectives, few significant benefits in relation to costs). In the fourth project, the success rating excluded consideration of the (relatively minor) drinking water component, but if it had been included it would probably have been classified as largely unsuccessful. The remaining three projects, which were not classified according to Evaluation Department's current criteria, would probably, by those criteria, have been judged to have been partially successful.

E9 The Nepal Eastern Region Project was judged by the evaluation report to have been partially successful. Eight (out of an intended 16) water supply schemes had been completed to a high standard of construction, often in difficult logistical and physical circumstances. The community health and maintenance training components had been effective and the project had brought significant benefits in the form of better water quality, better health conditions and

practices, and a better quality of life, especially for numbers of women, arising in part from easier access to domestic water and associated time savings. The project had been less successful in that there were significant time and cost overruns and fewer schemes were completed than planned. Three of the largest schemes were left unfinished. There was also doubt over the longer term sustainability of the completed schemes, given the inadequate budgetary and institutional support, and the lack of capacity for management at the community level.

E10 The Busoga project was classified by the evaluation report as largely unsuccessful. By rehabilitating some 234 boreholes, the project almost doubled the original target set (120), and did so within budget. But it was largely unsuccessful in achieving its other objectives. It did not establish a functioning community-based O&M system and the sustainability of the project was therefore in doubt. Less than two thirds of the rehabilitated boreholes were working satisfactorily, and only one third (excluding those where pumps had been subsequently replaced or repaired by Danida) were both in regular use and working satisfactorily. The project did not make any impact on hygiene and sanitation practices in the same communities and any health benefits were likely to have been minimal. The project was low cost but not cost-effective. Alternative water sources, which existed in parts of the project area, could have been improved at low cost.

E11 The Moyambe project was classified as partially successful. In those villages covered by the project prior to 1989, where health education and latrine construction received a low priority, the project failed to meet its objectives and was unsuccessful. In those villages covered after 1989, where there was an associated health education programme and high latrine coverage was achieved, the project was expected to lead to a sustainable improvement in the health of the villagers.

E12 The Madura Groundwater Irrigation Project in Indonesia was largely unsuccessful in improving domestic water supplies in the project area. Some 60 existing tubewells were adapted to include a domestic water component (and 40 wells were sunk). But water for domestic purposes was not available from the tubewells all year round, presumably in order to minimise the extra costs involved over and above the costs of providing water for irrigation. In the wet season, when the tubewell was not required for irrigation, the pump was only run for two hours a *month*, to charge the battery. It would need to have been run several times a day in order to fill the tanks erected for domestic water storage. As a result the tanks had fallen into disrepair, with taps missing etc. The evaluation report also found that water from existing shallow wells was generally preferred because it was readily available and free, while tubewell water was not free. The evaluation report did not look at the use of the wells sunk by the project for domestic water use because the domestic water component was a very minor part of the overall project.

E13 The Gurkha Welfare Trust project is judged by this synthesis study to have been partially successful on the grounds that it constructed more than 90 drinking water installations to a high level of specification within cost limits. But it had not been successful in establishing adequate community-based maintenance systems, as specified at appraisal, thus threatening the long term sustainability of the project. There was the potential for health benefits arising from increased quantities of water that would allow changes in personal hygiene habits. The project had probably not been successful in significantly reducing diarrhoeal diseases perpetuated by the faecal-oral route. Time savings benefits were judged to have been minimal, being restricted to a small proportion of households for a couple of months of the year, during the dry season. Women, however, appreciated the convenience of having water on tap.

E14 The Swaziland project is judged by the synthesis study to have been partially successful. It completed 25 village water supply schemes, and 10 partly so, with ODA funding, to a generally good standard of design and construction. No health benefits were found, but the evaluation study concluded that this was probably to be expected in the absence of a "deliberate input of health education". There were significant social benefits in the form of very large time savings to women in collecting water. Communities' unwillingness to contribute to running costs of the schemes, as planned at appraisal, has implications for the schemes' sustainability.

E15 The Lesotho Village Water Supplies Project is judged by the synthesis study to have been partially successful. The evaluation study highlighted the very low breakdown rate of rural water installations. No health benefits were found, but the evaluation study, echoing that of the Swazi project, attributed this to the lack of an associated hygiene education promotion programme. Modest time savings benefits were found, which reduced the domestic burden on women. The hypothesis that the project would stimulate other economic activities was not proven.

