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User participation and implementation strategies in water and sanitation projects

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The International Drinking Water Supply and Sanitation Decade has focused attention on the urgent need for water and sanitation in the developing world. However, an alarming number of existing systems, in some countries one third to one half, are broken down or not working. Non-participation by the users has been singled out as a major cause of this high rate of project failure, and increasingly donor agencies and local governments are insisting that the intended beneficiaries be involved in projects. This study analyses user participation in a variety of water supply and sanitation projects in Africa, Asia and Central America. The common key factors which have resulted in some very successful projects are identified and suggestions made on how to implement a user participatory project.

The urgent need for water and sanitation facilities in the developing world is a fact we scarcely need to be reminded of. The figures speak for themselves. Some 2.5 billion people in developing countries are at risk from a variety of diseases of which at least 80% can be related to an inadequate supply of water and the unsafe disposal of wastes. In some of the world's poorest countries less than 50% of the children survive beyond the age of five.

A recent estimate is that 43% of developing country people have reasonable access to a safe water supply and 25% have some form of sanitary waste disposal. These figures are probably overly optimistic.

Population growth in developing countries is increasing at a staggering rate. By the year 2000 the United Nations projects that over 4.85 billion people will reside in the developing world. Almost 2 billion people (1.96) will live in urban areas while the remaining 2.89 billion will live in the country. The present

Kenyan population of over 15 million, for example, will double by the end of the century. The estimates are that urban areas will grow much more rapidly than rural as the rural-to-urban migration trend intensifies. Mexico City is expected to have 30 million inhabitants by the year 2000, Nairobi 15-20 million, Karachi 20-30 million and Bangkok 15-20 million.

The year 2000 is only a decade and a half away. A key question is how are these nearly 5 billion people expected to be living in the developing world going to be provided with water and waste disposal facilities? The answer is not very well if past experience is a reliable guide.

Efforts to provide water and sanitation facilities in the developing world up to now have not been an outstanding success story. Estimates vary as to the percentage of water and sanitation facilities which have been installed and that are working effectively. It is difficult to get a reliable overall figure although documentation is available for certain regions and countries.

It was estimated by Cairncross *et al* (1980) that 30% of water systems throughout the developing world are not working while the World Health Organization in 1974 calculated that 50% of the handpump tube wells are not working at any one time in Bangladesh and

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Thailand. In Nepal in the western development region 52% of the water supply systems constructed prior to 1981 were found to have major defects or to be not functioning (Strauss, 1983). A detailed analysis of six representative rural water schemes completed between 1971 and 1975 in Kenya revealed that all were in need of major rehabilitation (VIAK, 1977). The systems had broken down due to design errors, poor construction or the lack of an adequate operation and maintenance programme. Another study in Kenya showed that only 40% of the rural people who were supposed to be receiving water from rural water projects were actually being served (McPherson *et al.*, 1984). Over half of the facilities supplying water were not operating, were broken down or provided a much-interrupted service. Similar reports on the failure or non-operation of systems have been made for many other countries in the developing world.

There are many reasons why individual projects have failed. The most common major ones are:

- design errors;
- poor construction;
- use of inappropriate technologies;
- lack of funds;
- opposition or apathy by the intended users; and
- absence of an operation or maintenance programme.

Examples can be given of projects in many countries which have not worked due to one or some combination of these factors. There are many individual case studies.

The failure of schemes has a doubly negative impact. First, considerable sums of scarce money have been wasted, funds which could have been used elsewhere. Second, the recipients become disillusioned and are less likely to be receptive to future development projects.

The failure of existing systems has led some donor agencies to support the rehabilitation of existing schemes rather than the construction of new facilities. This is a cost-effective solution which makes sense in the short term. However, unless the underlying reasons which caused the system to fail in the first place are corrected rehabilitation is a repetitive, futile exercise and becomes a form of operation and maintenance.

Concern about the failure of projects has led to a large number of studies and assessments of project performance. From these two main recommendations have been consistently repeated. These are that successful projects must involve the use of an appropriate technology, one that can be understood and accepted by the beneficiaries and hopefully largely maintained by them, and that the inclusion of the

users in project implementation is essential. The two are not entirely separate, as community participation is more readily included in an appropriate technology project.

Technology choice

Let us first look briefly at the question of technology choice. Many case studies and reports have shown that high-cost conventional engineering solutions such as waterborne sewerage, sophisticated water treatment plants and abstraction systems are inappropriate solutions particularly for rural areas in the developing world where most of the people live. However, in certain situations, for example the provision of water and sanitation to city core areas, conventional solutions may be the best and most appropriate answer.

High-cost conventional systems such as piped water, sewerage and sophisticated water treatment are inappropriate for several reasons. The first consideration is costs. Simply put, these systems are too costly for developing countries at the present time. Most countries cannot afford to service existing populations with conventional designs, never mind the projected populations of the year 2000.

There are other reasons, too, why these solutions are inappropriate. A high and relatively sophisticated level of operation and maintenance is required and spare parts have to be imported which puts a drain on scarce foreign currency. All things considered conventional engineering high-cost technologies are not the answer if the rapidly increasing populations of the developing world are to be provided with water and sanitation facilities.

During the last decade much research and experimentation has gone into the development of appropriate low-cost solutions. All sorts of possible methods have been tried. The developing world is full of unique answers for water supply or sanitation problems and littered with the debris from experiments in technology which have failed.

The research and tinkering with handpumps is one example. The developing world has innumerable broken down, abandoned or rusting handpumps of a variety of makes. As a generalization it is probably true that most handpumps break down inside a year. In the sector there are countless handpump aficionados each with his own version of the perfect pump and a trail of prototypes in the rural areas of the world. The World Bank and the United Nations Development Programme project to evaluate, test and develop a village-level-operated and maintainable (VLOM) handpump is a very positive step in handpump technology development. This pro-

gramme will hopefully stimulate the production of affordable and dependable handpumps for ground-water extraction. The tremendous number of different handpumps available and being supplied by different donors is another concern which makes it difficult if not impossible for a country to institute a proper maintenance programme. A notable exception to this is Zimbabwe where the government is wisely trying to limit the number of handpumps and encourage the Blair handpump for use in shallow wells and the Zimpump in deeper wells.

However, there have emerged from research a number of proven low-cost solutions which are technically sound and economically feasible. Good examples include:

- handpump wells;
- gravity water schemes;
- protected springs;
- subsurface dams;
- rainwater catchment;
- various pit latrines; and
- simple water treatment methods.

Interestingly, the best solutions are usually very simple and are often improvements on traditional methods. For this reason they are readily accepted by the intended user. The sanitary bucket and windlass developed by the Blair Research Institute in Zimbabwe is a good example. Here a specially designed narrow bucket is lowered down into a drilled well inside a 150 mm casing and raised using a windlass. The design of the apron limits the possibilities for the introduction of pathogens into the well. Initial monitoring of water quality has shown that faecal coliform counts are extremely low and within the limits usually accepted for safe water.

The existence of simple appropriate technologies by themselves will not solve the water and sanitation requirements of the developing world. Projects which employ an appropriate technology solution are as prone to failure as high-cost engineering solutions. During the last decade many donors have sponsored projects using technically sound low-cost appropriate solutions and these have been unsuccessful. Reports exist describing appropriate technology projects which have broken down, have not been completed or have been abandoned. These are examples we do not like to think about, especially as user participation was a component in a number of them. For example, in Kenya a part of the Ministry of Water Development's programme for rural water supply involves the support of self-help projects proposed by the people. Many of these projects include the building of simple gravity water systems, shallow wells or roof catchment schemes. As a recent report has documented

(VIAK, 1977) a considerable number of these facilities have broken down, have not been completed or are providing unreliable service. The reasons for failure are the same as in projects using more conventional approaches, namely:

- lack of funds;
- lack of user support;
- absence of an operation and maintenance programme; and
- poor project organization and management.

The point is that the existence of an appropriate technology is only part of the answer. The successful implementation or delivery of the technology is the key to success.

User participation and implementation

The absence of user participation from projects has been identified as an important element in the implementation of successful projects. Donor agency staff and others in the sector have debated long and hard about what community participation is. The semantics of the terms user, participation, community and involvement have given rise to much concern. At a recent international workshop on community participation a considerable amount of time was devoted to defining community participation. In the end the participants failed to reach agreement as to what was meant by participation or even by community. However, semantics aside the underlying philosophy is that the people who are to benefit from a project should be involved in its implementation.

The benefits of using a user participatory approach are evident, and have been substantiated and described from development sectors other than water and sanitation. These include:

- lower costs;
- a greater likelihood of user acceptance of the technology;
- appropriate and socially acceptable designs;
- user care and maintenance of facilities; and
- the assumption by the users of part if not all of the responsibility for operations and maintenance.

While numerous studies exist describing or debating the benefits to be derived from user participation (Feachem, 1980; Van Wyk-Sijbesma, 1981), the literature especially in water and sanitation is remarkably sparse when it comes to studies describing the implementation of user participation projects. Few data are available about what is the best method of implementing a user participatory approach or how a project should be organized to assure its success. One exception worth mentioning is the description by

Glennie (1983) of the Malawi gravity water experience. This lack of information on user participation provided the incentive for the research on which the present paper is based.

Methodology

The original aim of the study was to analyse a number of successful projects involving user participation in the water and sanitation sector throughout the developing world. The objective was to identify the common key elements which had contributed to their success. As the research progressed the study design was modified as it became clear that a great deal could be learned from projects which were not working at all or only working moderately well.

The research concentrated mainly but not exclusively on projects which employed simple appropriate technology solutions as these are more likely to contain a user participation component. Information on projects was obtained in three ways:

- (i) By reviewing the literature on user and community participation. This proved extremely useful and provided valuable information on sectors other than water and sanitation and on experiences from many different countries and cultures. However, with one or two exceptions such as Maria Cardenas's (1979) work in Paraguay and Glennie's (1983) in Malawi, little detailed information on implementation strategies was available.
- (ii) A number of international agencies were visited and asked to identify successful user participation projects with which they were either involved or familiar. As might be expected a long list resulted from this exercise. One problem that emerged was the anecdotal nature of the information. Quite often people referred to a project they thought was successful but could provide no specifics as to performance, elements contributing to its success, etc. Rumour and heresay sometimes seem to be an important element in project evaluation.
- (iii) The third approach was to visit and spend time with projects in the field. We would like to be able to say that the projects were carefully chosen based on a review of the information gathered from the literature and the agency reviews. However, this would not be true. The choice of projects was dictated largely by the countries we happened to be working in. There were projects especially in South America that should have been visited but this did not prove

possible. However, user participatory projects were investigated in the following countries: Malawi, Nepal, India, Thailand, Zimbabwe, Botswana, Guatemala, Kenya, Pakistan and Indonesia.

In each country visits were made and information collected on the main user participatory projects identified. Again some projects were overlooked, especially in India and Thailand.

The site inspections demonstrated above all else the absolute necessity of visiting and spending time with projects if an unbiased and realistic assessment and evaluation of a project is to be obtained.

Projects which were described in glowing terms in project documents, office reports and by head office staff as successful participatory projects proved on close inspection to have serious problems. In some cases very considerable credibility gaps existed between reality in the field and the written reports and dreams in the donor agency's or implementing body's office. These differences are quite understandable. Field staff do not like to admit that projects are not working successfully and headquarters staff do not wish to hear that projects are not performing in the way planned in the original project document. The unfortunate consequence, however, is that this tends to perpetuate rather than resolve problems.

The site visits clearly showed that it is necessary to review projects in the field and that it is not enough to visit the agency staff administering the projects in the country. Again sometimes considerable disparities were found between what was actually happening in the villages and what the agency staff in the country office believed was happening. The field staff in the villages knew of the problems but the office staff were either unaware of the difficulties or did not wish to admit of them.

The research design initially intended to look only at successful projects. The literature review concentrated on identifying projects which were successful and agencies contacted were asked to describe successful projects. In fact the research ended up considering the whole spectrum from projects which were total failures to ones which, using any criteria, were extremely successful. This happened because

- (i) some of the projects looked at proved not to be as successful as they were supposed to be;
- (ii) descriptions of unsuccessful case studies were read in the literature; and
- (iii) problem projects were encountered while reviewing projects in the sector in a given country.

A great deal was in fact learned from projects with problems.

Results

The results of the research can be divided into two parts:

- (i) a discussion of the major problems of adopting a user participatory approach; and
- (ii) most importantly, a review of the key factors which contribute to the successful implementation of user participatory projects.

Problems

A number of problematic issues emerged from the study:

(a) *The definition of user participation.* In some projects it is clear that considerable confusion exists as to what is involved in a user participatory approach. The administrators and policymakers understand the results they wish to achieve from a user participatory approach and are familiar with the arguments for and benefits of user participation. On the other hand, at another level the field staff or implementing agency personnel may equate participation with self-help or may have developed their own ideas as to what participation signifies in their particular context.

Kenya is an example of the problem. The Government of Kenya has steadfastly supported the concept of people helping themselves. User participation in projects, especially in the rural water supply programme, is officially encouraged and is included in every development plan and policy statement. Self-help is actively promoted. However, user participation in projects has proved very difficult to achieve and many projects have failed, in some cases utterly.

A contributing reason for this lack of success is the attitude of the water engineers to user participation and their understanding of what participation should be. Projects have failed due to conflicts between the users and the Ministry of Water Development staff. The staff have equated user participation with self-help and the provision of free labour which will reduce project costs. Also the attitudes and behaviour of the ministry water staff have in some instances alienated the locals and as a consequence the user participation process has broken down.

(b) *Lack of training.* Deficiency in the skills necessary to implement a user participation project was evident as the reason for the downfall of many projects. Senior administrators or agency officials who may understand the implication of undertaking a user par-

ticipatory project often fail to realize that the staff charged with making the scheme work at the village or community level do not possess the necessary skills or attitudes to successfully carry out the project. User participation cannot be arbitrarily mandated from above and left to local level staff to implement without training.

(c) *Lack of commitment by staff.* An apathetic attitude to the whole idea of user participation in projects was evidently contributing to the failure of some projects. Staff at the village level were simply not interested in implementing a user participatory approach or in working with the users. In some cases participation seemed to mean telling the users what they were to do or informing them about what was going to be done.

Key factors in successful projects

A number of projects were identified in which the user participatory approach is working very successfully. Some of these programmes have been operating from many years, in the case of the Malawi Gravity Water scheme for 15, while others have been in place for a much shorter period. Projects were considered successful if the objectives of the project were being realized and if the beneficiaries and the implementing agency were obviously working together in an amicable and integrated way. The attitude of the users and of the project staff towards the project proved to be one of the best indicators of success. In the field if a project was working well this was obvious immediately.

The level of community involvement varied from project to project and country to country. Although ideally the users should be involved in every aspect of a project, in reality this is not always feasible. Sometimes lack of time limits the degree of participation; in other cases it is the technology or the level of development of the people. The Bindura Primary Health Care programme in Zimbabwe is a good example of the time constraint. The users are farm labourers who work six days a week on the commercial farms. Sunday is the only day they can contribute to the project. However, they contribute willingly and enthusiastically on this day.

Thus success should not be measured according to the extent to which the users are involved in a project but by their enthusiasm and the way in which they are successfully integrated into the project. The quality of the participation is the most important criterion. Among the most successful of the projects identified and the longest operating were:

the Malawi Gravity Water scheme;

the Guatemala Rural Water scheme (Aqua del Pueblo);
the Lutheran World Federation project in Zimbabwe;
the Baldia Urban Sanitation project in Karachi;
and
the Thailand Roof Catchment scheme.

There were a number of others still in the process of implementation such as the Bindura Primary Health Care project in Zimbabwe, the Livulezi Shallow Wells programmes in Malawi, the Rural Sanitation project in the Punjab and the Kwale Rural Water Supply project in Kenya, to name a few which are successfully employing a user participatory approach. However, only time will tell if these projects can sustain their present achievements, especially in terms of operation and maintenance.

The key factors which appear to explain success in a user participatory project are:

(a) *A commitment to a participatory approach.* The implementing agency must be fully committed to a user participatory approach. The agency should understand what is involved in including the intended beneficiaries in a project. They should realize and accept that this approach requires that a lot of time will be spent in discussions which at times may seem to be going nowhere, that all staff will require training in working with the users and that project organization, management and timetabling will have to be more flexible than in a conventionally planned engineering project. This commitment must be genuine, based on the conviction that user participation is a valuable and useful approach to adopt. During the course of the research projects were encountered which paid lip service to the idea of user participation. Usually this was because the donor agency or local government supported the idea. Half-hearted cosmetic attempts were made to involve the users. When these failed the usual explanation was that the beneficiaries were not interested or not organized.

(b) *Project organization.* The project organization should carefully integrate the intended users into the project. User participation is seen as central and is not a fringe item or something which can be tacked on. All the successful programmes were well organized, managed and planned. This is probably the single most important factor contributing to success.

Carefully and sensitively executed socioeconomic and cultural studies need to be made of the user community in order to determine the feasibility of a user participation approach, the best way of communicating and collaborating with the users, the degree and

type of participation which may realistically be expected and the most appropriate mechanism for including the beneficiaries in the project.

The organization of projects can vary depending on what is most appropriate for the individual group. The formal identification of a project staff group and a user group may be the best mechanism in certain instances; in others, project staff may work directly with the users.

(c) *Staff recruitment and training.* The attitudes and commitment of all staff to a user participatory approach are vital elements in a successful programme. It is not enough for the senior administration to be supportive, as after all they seldom have much direct contact with the users. More important is that the field staff, foreman and even support staff must be enthusiastic. A good many examples can be cited of projects which are in trouble because junior staff do not share senior management's views or commitment to participation.

The Malawi Gravity Water scheme is an excellent example where there is a focus on staff recruitment and training. In this programme the field staff, including foremen and field technicians, are selected more on the basis of their attitude and their ability to work with rural people than for their academic achievements. The screening process for field technicians is thorough. From 1000 applicants usually only 20 are ultimately selected. Once integrated into the programme the field technicians are trained in community relations and skills. Role playing and field demonstrations are techniques which are used to instruct them on how to work and establish good relations with the users.

Training stresses the importance of a rapport with the people and of adopting informal and formal methods for talking with them. In training the users about operations and maintenance the field technicians may sometimes give an organized talk or training session. At other times as they pass through a village they may simply seize an appropriate opportunity to discuss problems or give some instruction. The importance of a good working relationship and regard between the project staff and the beneficiaries cannot be overemphasized.

(d) *Project leadership and management.* The character of the project leader emerged as a major factor contributing to success. The Malawi scheme, the Thailand Roof Catchment scheme, the Baldia project and the Lutheran programme are directed by strong and charismatic leaders. The talents, imagination, drive and abilities of these individuals have contributed in a major way to the success of the projects. In setting up

a project it is clear that time devoted to choosing just the right individual to be in charge is time well spent.

(e) *Strong leadership in the user group.* The existence of strong leadership in the user group to give direction is another factor contributing to success. This leadership may be traditional or political, or it may simply be the presence of a forthright and influential individual. These people, if they are committed to the project, can greatly facilitate organization, planning and implementation. In Zimbabwe, for instance, in the Lutheran project in Matabeleland the church women have been largely instrumental in making the programme a success.

(f) *Adoption of a socially and culturally sensitive approach.* The adoption of a socially and culturally sensitive approach by implementing agency staff was an important element contributing to success. In Kenya the absence of a rapport between Ministry of Water Development staff and the beneficiaries was identified as a reason for the failure of some self-help projects.

(g) *Political will.* The support of the government for user participation initiatives was an important reason leading to success. In Malawi, Zimbabwe, India, Botswana and Guatemala, for example, the sustained encouragement of the government is an important element. In Kenya, while the government strongly supports the concept of self-help the execution of schemes has led to problems.

(h) *Real desire for the project.* From the projects visited it became clear that it is easier to obtain user participation if there is a real need for the benefits. An excellent example of this is the Kibwezi Shallow Wells programme being implemented by AMREF (the African Medical Research Foundation) in the Machakos district of Kenya. This is an area where water is urgently needed. When the project was initiated the people were so anxious to obtain water that they were hand chipping a well into solid igneous rock at night by candlelight.

If the need for the project's benefits is not perceived by the beneficiaries as a high priority, active promotion of the project may be essential to stimulate interest.

In addition to the major factors, several others seemed to be important. These included the ability of staff to work easily and adjust to the way of life of the user community and the selection of the technology to be used. There seemed to be some support for the idea that the simpler the technology the easier it was

to implement a successful user participatory approach. Thus gravity water schemes and roof catchment projects were more likely to be successful the more technologically advanced and demanding handpump wells.

Conclusions

While the debate as to what is meant by such words as user, community and participation will doubtless continue, the intent of a participatory approach is clear: it means the inclusion of the intended beneficiaries in the solving of their own water and waste problems. The degree of participation is really not the central issue. Ideally users should be involved in every phase of a project but this is sometimes not feasible for a variety of reasons. What is vital is that the participatory experience should be an agreeable and beneficial experience for the users so that when the facilities are constructed they have a sense of pride in their ownership of them and are pleased with what they have accomplished and have learned how to care for the system.

The inclusion of the users will bring many benefits, the chief being an improvement in operation and maintenance. Lack of proper operation and maintenance has been identified as the reason why many projects have failed in the developing world.

The concept of user participation is being increasingly advocated, usually in association with the use of low-cost technologies by donor agencies, developing country governments and others in the sector as a solution to the alarming failure rate of water and sanitation schemes. In some quarters there is a feeling that the inclusion of a user participatory component in projects will make all come right.

Nothing could be farther from the truth. Our research into 'user participatory projects' has shown that they are as likely to fail if improperly organized and planned as conventional projects. The emphasis on user participation in projects is relatively new, so in a way the results are not yet in. However, if this study is in any way indicative it is safe to predict that a embarrassing number of failed 'user participatory projects' will emerge over the next number of years.

Much of the failure of projects can be traced to a lack of understanding of what is required to successfully implement a user participatory project and what the process involves. The undertaking of a user participatory approach requires a major change in attitude and organization and a shift in project emphasis if it is to be successful. It cannot simply be added to a project. Rather the project must be built around the approach. The approach is central and must of necessity dictate design, technology choice, staff training, recruitment policy, timetabling mar

agement and overall organization. A number of major projects were identified which were attempting to include user participation as an addendum and these efforts, as might be expected, were not proving very successful.

The adoption of a user participatory approach will require a change of attitude among engineers and other implementers and this will be perhaps the most difficult obstacle to overcome, as attitudes change slowly especially in conservative professions.

In the course of the study a wide range of experience with user participation was encountered. Some projects were outstanding successes by any standards, others were working moderately well but with some question marks regarding their future, while some had failed entirely. Useful lessons were learned from all. Hopefully the key factors identified as responsible for success will serve as guidelines in the planning of future projects and lead to more success stories like the ones found in Malawi, Pakistan, Thailand, Zimbabwe and Guatemala.

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