

## COMMUNITY MANAGEMENT OF SMALL URBAN WATER SUPPLIES IN SUDAN AND GHANA

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### Introduction

Community management of water supplies is an approach that is gaining popularity among sector development professionals and practitioners, and promises to be the most sustainable effort in the sector tried to date. Two fundamental characteristics distinguish community management from other participatory and community development-oriented approaches in the sector.

First, community management occurs when the people of a community, through representative community organisations, have the legal right to assume ownership and responsibility for their water supply. They are entitled and able to make decisions and implement actions controlling use of the water supply.

Second, community management occurs within an enabling environment. Government sector agencies and donors play a major role in providing this enabling environment, which includes: a policy framework to foster community management; adequate information and assistance in organisation at the community level; the promotion of affordable and appropriate technologies and service levels; training and human resource development focused at the community organisations; and appropriate financial arrangements for capital and recurrent costs, with significant cash contributions from the community, and access to external loans and grants.

Successful examples of community managed water supplies can be found in various African countries. In Sierra Leone, Kenya and Togo for example, village organisations have been encouraged to define their water supply problems, and to formulate their own solutions. These solutions, often shallow wells, handpumps, spring catchments or rainwater harvesting, are then implemented by the villages, with assistance from various government and non-government organisations (McCommon, Warner and Yohalem, 1990). In Malawi, communities take the lead in planning, mobilising, constructing and maintaining their own gravity-fed piped water supplies (Nyumbu, 1990). In Ghana, community management of handpump schemes has been established on a pilot basis (Yanore, 1990).

While these successes are encouraging, and add to our knowledge and understanding of the dynamic and evolving approach of community management, they are limited to relatively small communities, utilising relatively simple levels of technology. Several researchers have described examples of community management of mechanised water supplies, but in the context of developed countries in Europe and North America (Tamm, 1991. Katko, 1992. Livingstone and McPherson, 1993). While these examples are useful in understanding some of the processes involved and constraints faced, they are not directly applicable to African situations.

Since 1987, the author has been involved in an experimental approach to community management of small urban water supplies in both Sudan and Ghana. The purpose of this paper

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is to describe some of the special considerations involved in small urban water supply situations, the strategies developed to enable community management, and the experiences gained.

### DEVELOPMENT CONTEXT

The community management of small urban water supplies discussed in this paper takes place in two development contexts.

In **Sudan**, the activity was focused upon the Northern Darfur Water, Sanitation and Hygiene Education Project (1987 to 1990). In this project, 25 towns in two districts of Northern Darfur Region were involved. Towns ranged in size from 3,000 to 10,000 people: 15 towns had existing mechanised water supplies that were to be rehabilitated; the remaining 10 towns developed new water supplies. In all cases, the technology utilised was the same. Very deep boreholes, the only available reliable water sources, were equipped with diesel-powered pumps, and supplied water to elevated storage tanks. A limited distribution system of standpipes, troughs for watering livestock, and a tank filling outlet were provided in each town. Some 3,000 wateryards are in existence in Sudan, most constructed by the National Corporation for the Development of Rural Water Resources (NCDRWR) in the 1960s and early 1970s. More than 50 percent are inoperative, and most require major rehabilitation (McPherson and Livingstone, 1990).

In **Ghana**, the activity is focused upon the Ghana Water and Sewerage Corporation (GWSC) Assistance Project (1990 to 1997). In this project, towns and cities in the three regions of northern Ghana are involved. In the initial phase of the project, 12 towns and cities are involved. Towns and cities range in size from 6,000 to 50,000 people. All have existing mechanised water supplies that are to be rehabilitated. Also, each town and city has a variety of non-mechanised water supplies that are in use; predominantly boreholes with handpumps and shallow hand-dug wells. The technology utilised is blended, to incorporate rehabilitation of both the mechanised and non-mechanised water supplies within each town and city. Mechanised supplies use diesel-powered, solar powered or electrical grid-powered pumps to withdraw water from boreholes, or from surface water reservoirs and streams with accompanying water treatment. Water is supplied to elevated storage tanks, and distributed through pipelines to public standpipes and private house connections. Non-mechanised supplies include boreholes and shallow wells with VLOM handpumps. Some 50 mechanised water supplies, 3,000 boreholes with handpumps, and innumerable shallow hand-dug wells exist in northern Ghana. They have been constructed primarily by GWSC, but also by non-government organisations and religious agencies. Most mechanised water supplies are inoperative or operating far below original capacity, and all require major rehabilitation. While more than 80 percent of boreholes with handpumps are claimed to be operational, most shallow hand-dug wells run out of water in the dry season each year (GWSC, 1992a).

Both projects were supported financially and technically by the Canadian International Development Agency (CIDA). The Northern Darfur Water, Sanitation and Hygiene Project was implemented through the NCDRWR by a Canadian non-governmental organisation. The Ghana Water and Sewerage Corporation Assistance Project is implemented through the GWSC by a Canadian consulting engineering company, Wardrop Engineering Inc.

### COMMUNITY ORGANISATION

Towns with wateryards in Northern Darfur Region, **Sudan**, usually had existing formal committees or informal groups with some interest in town water supply, but in most cases town

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health committees (formed by the Ministry of Health) or town development committees (formed by local/district government) played the main role in relation to water supply. Towns without existing wateryards normally had health and/or town development committees already established.

Project community development workers gauged the relative strengths of the existing community organisations, and attempted to reorganise or restructure them into wateryard committees. This was possible in many cases. Where existing community organisations were relatively weak or ineffective, attempts were made to amalgamate organisations into wateryard committees, and to organise and structure them. In a few specific instances, town youth organisations proved to be active and effective, and were incorporated into the wateryard committee structure. Wateryard committees averaged eight members, and given the traditional Islamic environment in the towns, it was necessary to have separate sub-committees for men and women. The male sub-committees normally had five or six members, and chose to concentrate upon technical and financial aspects of wateryard operation and maintenance. The female sub-committees normally consisted of two or three members, and chose to address hygiene, sanitation and water utilisation issues, but frequently played a major role in financial management.

Initially, 18 months was spent identifying community organisations and mobilising wateryard committees. This activity was done in conjunction with town baseline and demographic surveying. Since NCDRWR has no existing capacity for such work, community development workers were seconded to the project from the Ministries of Health and Social Welfare, and additional community development workers were hired on contract from an extension organisation attached to the University of Khartoum.

Towns and cities in northern Ghana dealt with in the GWSC Assistance Project all had existing mechanised water supplies, but no effective community water supply committees or groups existed. In some towns where boreholes equipped with handpumps has been installed by a previous CIDA - supported project, handpump committees had been formed, but concentrated upon raising funds for the handpump tariff and keeping the pumpsite clean. Two towns had experience in running their mechanised water supply through their town development committees, but both attempts had failed and the committees had become inactive.

More than one year was spent investigating various options for community organisation that could potentially manage the mechanised water supplies to be rehabilitated. The consensus among the project, community leaders and the Government of Ghana was that a formally constituted Water and Sanitation Development Board (WSDB) would be the optimal organisation. Linked directly to the district government structure, and thus supported by established decentralisation legislation, the WSDB would have a high degree of autonomy in decision-making, and government support of its activities, within a defined water service area encompassing the entire community. The WSDB could control the total community water supply, both mechanised and non-mechanised.

Project community development workers spent a total of 30 months, first preparing and mobilising communities, and then assisting in the organisation and official formation of WSDBs. This activity was done in conjunction with community baseline, socioeconomic and demographic surveying. GWSC has no existing capacity for community development work, so the project retained a team of experienced community development workers through a Ghanaian consulting company. Each community development worker had a part-time GWSC counterpart assigned.

WSDBs averaged 12 members, elected or appointed by the various traditional, political,

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social, residential and economic groups that comprised the community. Women's interests were well-represented, with usually four to six members being female. Three WSDBs out of a total of 12 formed were headed by women, and women were present on the executive committees of all WSDBs. The executive committees consisted of the chairperson, secretary and treasurer, and they delegated management responsibilities to designated administrative, financial, technical and utilisation management officers. In this way, all WSDB members were active in water supply management.

### PLANNING FOR REHABILITATION

Although both projects were guided by similar overall objectives, to improve the sustainability of the water supplies being rehabilitated, they exhibited differing emphases upon community participation in planning for rehabilitation.

Communities in Sudan had little input into the technology employed in water supply rehabilitation. Although choices were limited, due to restricted water resource availability in the project area, wateryard equipment and layout was predetermined by the project. As the project was implemented, improved communications between wateryard committees and project management resulted in some modifications to wateryard layout and configuration, but these were relatively minor. No attempts were made to introduce the concept of solar-powered pumping equipment for example, to lessen the communities' dependency on unreliable supplies of diesel fuel. To great extent, the NCDRWR was responsible for insisting upon wateryard conformity to national standards, seeing themselves as being operators and owners of the rehabilitated supplies once the project's experiment in community management had failed and was over.

By contrast, in Ghana communities had considerable input into planning the rehabilitation of their water supplies. A wide variety of water supply options were available in most communities, and WSDBs were encouraged to examine and evaluate the suitability and acceptability of these options. Rather than focusing exclusively on the mechanised supply in the community, most WSDBs included various non-mechanised supplies as part of the community water rehabilitation plan they were helped to prepare by GWSC. In particular, water service levels were chosen in reference to the consumers' willingness and ability to pay for the chosen service. Resulting WSDB rehabilitation plans were a blend of water supplies, technologies and levels of water service. For the mechanised components of these plans, alternative energy options were chosen whenever feasible by the communities to reduce operation and maintenance cost.

Hygiene education and sanitation planning also exhibited differing emphases upon community participation. The project in Sudan was more fully integrated, with substantial budgets for both hygiene education and sanitation promotion. With the NCDRWR lacking expertise and interest in these areas, communities were encouraged to plan and implement these components of project activity to a much fuller degree. In particular, wateryard committees, especially the female sub-committees, took an active role in formulating and delivering community hygiene education campaigns and messages. Both men and women took an active role in sanitation promotion: selecting sites for demonstration; constructing VIP latrines under supervision; designing appropriate latrine superstructures and promoting the concept of improved sanitation facilities throughout the community. In several cases, wateryard committees chose to subsidise latrine construction by interested home owners through wateryard water revenues.

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By contrast, in Ghana the project had a strong water supply emphasis. The budget available for hygiene education was small, and no budget was available for sanitation promotion. Despite this, community WSDBs became actively involved in planning and delivering community hygiene education campaigns and messages. Sanitation improvements have also been identified by the WSDBs as being urgently required, but without financial support from the project they were unable to progress beyond public education on sanitation improvements. Plans for community demonstrations of sanitation improvements to be funded possibly from water revenues, or from other sources were encouraged.

### FINANCIAL ARRANGEMENTS

In both projects, communities made some contribution towards the capital cost of water supply rehabilitation and construction. However, in the both cases, these contributions were relatively minor.

In Sudan, capital costs ranged from \$30 US to \$100 US (1990) per capita, depending upon the population of the towns. The equipment installed in each town was essentially the same, regardless of the population to be served. This deliberate oversizing of water supply facilities in smaller towns was a decision made by the NCDRWR, in order to standardise wateryard equipment and configuration. In several of the largest towns, two identical wateryards were installed if water demand exceeded the supply obtainable from a single wateryard. Community residents were not expected to contribute cash towards the capital cost of rehabilitation and construction. In some communities, wateryards committees organised community labour to undertake perimeter fencing of the wateryard.

In Ghana, capital costs ranged from \$60 US to \$160 US (1992) per capita, depending upon the technology utilised and the equipment installed. In some towns, groundwater was the main source and electrical grid power for pumping was readily available; resulting per capita rehabilitation and construction costs were in the lower end of the range. In other towns, treatment of surface water and/or the use of diesel or solar-powered pumps was necessary, resulting in per capita costs in the higher end of the range. Community residents who had opted for private house connections were expected to contribute cash towards the installation of this increased level of service. The number of houses choosing private connections ranged from 15 percent to 50 percent approximately, and individual contributions per house were in the order of \$100 US to \$160 US (1992). These contributions represented from approximately two up to seven percent of the total capital costs of rehabilitation and construction. In some communities, WSDBs organised community labour to undertake trenching for pipeline installation, on a sub-contract basis to the project.

In both projects, communities were responsible for paying the full cost of operating and maintaining the water supply. The approaches taken towards cost-recovery of operation and maintenance were somewhat different however.

In Sudan, a revolving fund was established into which all 25 towns paid their water revenues. Water tariffs in each town were the same, initially set at \$0.46 US/m<sup>3</sup> (1990). Tariffs were collected by wateryard attendants on a volumetric basis in the case of domestic consumption, and on a per head basis in the case of livestock consumption. Each wateryard committee purchased their own diesel fuel, oil and spare parts, and paid their own wateryard staff. In addition, each committee made a unit contribution to receive maintenance, repair and advisory assistance services

from the district maintenance teams established by the project. Surpluses of water revenues over operation and maintenance expenditures accruing in the revolving fund were the property of each wateryard committee. These funds were intended to cover depreciation and replacement of wateryard equipment, and possibly future wateryard and sanitation facility expansion or upgrading. A summary of the monthly financial performance of a sample of wateryards is given in the Table 1. On average, revenue was collected for 80 percent of the water pumped each month, leaving a wateryard committee with an average surplus of \$0.19 US /m<sup>3</sup>.

In Ghana, each WSDB established their own local bank account into which their water revenues were to be paid. They were encouraged to collect a deposit of approximately half a year's anticipated operation and maintenance cost prior to rehabilitation of the water supply. Each WSDB sets water tariffs to cover the cost of operating and maintaining their water supply, and tariffs ranged from \$0.10 US/m<sup>3</sup> to \$0.27 US/m<sup>3</sup> (1992). Tariffs are collected by WSDB members and employees on a volumetric basis from institutional and commercial customers, and a flat rate basis from domestic customers. Each WSDB will purchase their own diesel fuel or electricity, spare parts, oil and water treatment chemicals if required, and pay their own water supply operating staff. WSDBs have the option of undertaking maintenance and repairs using their own staff, contracting this service from the GWSC or from the private sector.

Surpluses of water revenues over operation and maintenance expenditures accruing in each WSDB bank account are used to cover WSDB administrative overhead, depreciation and replacement of water supply equipment, and allow for future water supply expansion or upgrading. A summary of the projected monthly financial performance of a sample of small urban water supplies is given in Table 2.

Table 1: Monthly Financial Performance of Wateryards in Sudan (1990)

	Tabit	Shengel Tobia	Musko
Water Pumped (m <sup>3</sup> )	2177	2719	2894
O&M Costs: *			
Fuel	91.60	121.30	111.10
Oil/Spares	12.40	21.60	15.90
Staff	138.30	163.30	146.70
District O&M/Team	201.00	201.00	201.00
Service	443.30	507.20	507.20
Total			
Unit O&M Cost/m <sup>3</sup>	0.20	0.19	0.16
Tariff Charged/m <sup>3</sup>	0.46	0.46	0.46

\* In 1990 U.S Dollars

Source: Livingstone, 1990

Table 2: Projected Monthly Financial Performance of Town Water Supplies in Ghana (1992)

	Zebilla	Nandom	Saboba
Water Pumped (m <sup>3</sup> )	9,000	12,990	5,520
O&M Costs: *			
Fuel/Electricity	313.30	1136.10	801.70
O&M Supplies/Services	77.80	95.90	159.80
Staff	240.00	240.00	240.00
Total	631.10	1472.00	1201.50
Unit O&M Cost/m <sup>3</sup>	0.07	0.11	0.22
Tariff Charged/m <sup>3</sup>	0.10	0.14	0.27

\* in 1992 U.S Dollars      Source: GWSC, 1992b

### TRAINING ACTIVITIES TO SUPPORT THE COMMUNITIES

Wateryard committees in Sudan selected two members to be trained as a wateryard clerk and a wateryard operator. These individuals received training from project staff during the wateryard rehabilitation and construction activities, to ensure their familiarity with the equipment installed. The wateryard clerk also received training in the control of water sales, revenue collection, daily recording, monthly report preparation, and the deposit of revenues into the revolving fund. The wateryard operator received training in operation, routine and preventive maintenance of the pump, engine and other wateryard equipment. Training was also provided to the wateryard operator in daily operational record keeping, including water meter and hour meter reading and fuel consumption measurement.

In addition to the wateryard committee personnel, the NCDRWR maintained staff at the project wateryards. Normally, a clerk, an operator and two guards were provided. For an interim period, the committee personnel and the NCDRWR personnel worked together with the wateryard committee managing the process. It was planned to eventually phase out the NCDRWR personnel at each wateryard and replace them with committee personnel. This is fact did not happen.

Training was also provided at the community level in Sudan in the areas of hygiene education and sanitation improvements. Normally, the female sub-committees at each wateryard were trained by the project in these areas. This training consisted of non-formal sessions conducted over a 6 to 12 month period. These women were then encouraged to develop community hygiene education and sanitation promotion campaigns and messages, which were subsequently delivered by the women and project staff in each community. Public education techniques included the use of audio-visuals, drama and role play, and puppetry on a limited basis. In some cases males in the community became sufficiently motivated by this training to assist the women in subsequent demonstration sanitation improvement activities. A total of about 60 demonstration VIP latrines were constructed in about 16 communities as a result.

WSDBs in Ghana delegated water supply management functions among all members. These individuals received management training through a series of workshops in the areas of financial management, technical management, administration, and water utilisation, hygiene and sanitation. WSDBs were encouraged to develop public education campaigns in their communities: to promote proper water utilisation; payment of water tariff; improved hygiene practices; and

sanitation improvements in individual compounds and in the community-at-large. After initial training, WSDB members and project staff jointly conducted public education sessions in the individual communities. Techniques included the use of audio-visuals, drama, role play, music, songs, dance and puppetry.

During rehabilitation and construction activities, WSDB employees such as supply operators will receive training from project staff and from GWSC personnel, to ensure their familiarity with equipment installed. WSDB members also will receive on-going training through regular meetings with project staff. Once the water supply rehabilitation and construction is completed in each community, it is proposed to provide approximately three to six months of practical management and operating training to the WSDB and their employees. After the completion of this "break-in" period, full management and operating responsibility for the water supply would be formally handed over from GWSC to the WSDB.

### INSTITUTIONALISING THE APPROACH

Institutionalisation of a community management approach to the operation and maintenance of small urban water supplies includes comprehensive human resources development within government sector institutions, and the creation of enabling legislative, administrative and financial arrangements to support community management.

The project in Sudan was specifically formulated as a pilot, to test the feasibility of a community management approach in two districts. Training was provided to NCDRWR staff at the operational and management level, to sensitise them to issues such as least-cost appropriate technology, community management of operation and maintenance, and hygiene education and sanitation promotion and integration with water supply activities. Training consisted of a series of in-country workshops, seminars and a conference. Participants included NCDRWR district/regional (Northern Darfur) and national headquarters personnel. Linkages were established between these personnel and sector personnel from other agencies within Sudan and from external support agencies. In addition, a limited number of external training courses in Canada and the United Kingdom were provided for project and NCDRWR personnel.

At the project level, arrangements were made to proceed with the community management approach, with the support of NCDRWR headquarters and the Ministry of Finance and Economic Planning. However, these arrangements were not consistent with national sector policy, which did not encourage community participation in water supply planning, development or management. Attempts were made by project, in collaboration with the UNDP/World Bank Regional Water and Sanitation Group and other donors, to encourage reformulation of national sector policy. These efforts were largely unsuccessful.

The project in Ghana was formulated primarily as an institutional strengthening exercise for the GWSC. A community management approach to water supply rehabilitation, operation and maintenance was the major component of this exercise. Training was provided to GWSC operational and management staff at the regional and national levels. Training topics included: community participation and community management of rehabilitation, operation and maintenance; least-cost appropriate technology; improved engineering planning, design and construction supervision; technical/industrial training for mechanical, electrical and workshop staff; commercial optimisation and improved financial management; hygiene education and sanitation promotion and

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integration with water supply activities. Training consisted of a series of in-country workshops, seminars and a conference, as well as a considerable amount of structured on-the-job training. Participants included GWSC district and regional personnel (primarily from the three northern regions), and national headquarters personnel. Linkages were established between these personnel and sector personnel from other agencies within Ghana and from external support agencies. In addition, it is proposed to provide a limited number of external training courses in other African countries and in the United Kingdom for project and GWSC personnel.

National sector policy in Ghana embodies the principle of community management of water supply rehabilitation, operation and maintenance. However, the main sector agency, GWSC, has not been able to progress very far in establishing community management of rural and urban water supplies. The project is perceived as being a means by which GWSC can proceed in this area, and gain experience in following a community management approach. Similarly, GWSC is being encouraged by the project to improve collaboration and cooperation with other sector agencies pursuing this approach. Legislative, administrative and financial arrangements to support community management are currently evolving at a national level, and are encouraging GWSC to pursue this approach.

#### GOVERNMENT COMMITMENT

The Government of Sudan appeared to regard the Northern Darfur Water, Sanitation and Hygiene Education Project primarily as a means to rehabilitate existing and construct additional wateryards in a problematic area of the country. Although some individuals within government sector agencies showed personal commitment to the project's activities in community management, tangible commitment from the NCDRWR was absent. While the project's significant external financial support was attractive to the NCDRWR, government financial support under their control was frequently delayed and eventually cut substantially. Generally, funds for rehabilitation and construction were forthcoming, but government funds for community development, hygiene education and sanitation promotion were always difficult to obtain.

Eventually, after the Northern Darfur Water, Sanitation and Hygiene Education Project was completed in 1990, and after the feasibility of community managed wateryards was demonstrated, the government of Sudan withdrew its physical support from the wateryard committees and confiscated the wateryard operation and maintenance revolving fund. As a result, the wateryards reverted to the former centralised, NCDRWR-controlled operation and maintenance system, which had been repeatedly proven to be ineffective, inappropriate and non-sustainable.

The Government of Ghana appears to regard the GWSC Assistance Project as a means to strengthen and streamline GWSC, and to establish community management of urban and rural water supplies. A considerable number of individuals within government sector agencies are supportive of the project's activities in community management, and tangible commitment from the GWSC is present and increasing. While a significant number of operational and management personnel within the GWSC remain sceptical of community management, deliberate obstruction is not evident. Government financial support to match external financial support is forthcoming. Although fiscal difficulties have resulted in reductions in government funding of all development projects in Ghana, the majority of funds received by the project are allocated towards community management enabling activities.

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The GWSC Assistance Project will not be completed until 1997. Therefore, it is too early to properly determine the true degree of commitment to community management. However, concurrent government-supported initiatives in the rural water sector, and planned initiatives in the urban water sector, indicate that the Government of Ghana is seriously addressing the issue and actively exploring means to enable community management of water supplies.

## CONCLUSIONS

Development, social, economic and political conditions in Sudan and Ghana are quite different. Also, the two projects to enable community management of small urban water supplies were formulated and implemented with significant differences. The communities involved are unique to both countries, and the water needs and supply options for the communities in Sudan and in Ghana are not really comparable. However, certain conclusions can be drawn from the comparisons presented in this paper, that indicate potentially successful strategies for community management of small urban water supplies, and that indicate common difficulties and constraints likely to be faced in implementing such strategies.

### **An Effective and Representative Community Organisation**

For many years, water committees have been formed by projects and by governments, to take part in development projects. Many of these committees have proven to be ineffective, and often slip into dormancy. To enable community management of small urban water supplies, strong and confident community organisations are an essential precondition. The main conclusions regarding community organisation from this analysis are:

- sufficient time and appropriate mobilisation assistance must be provided to allow community residents to select members to represent them in a community organisation;
  - a community organisation must represent all significant residential, economic, political, ethnic and special interest groups in the community;
  - highly-motivated or skilled individuals should be encouraged to lead the community organisation, regardless of their relationship to existing political or traditional leadership within the community;
  - it is usually difficult to ensure that women are effectively represented in a community organisation, but patience, flexibility and innovative ideas can often result in ensuring that women are fully involved;
  - membership in a community organisation should be for a specific time, such as two or three years, to allow members to be replaced as they or the community residents see fit;
  - the community organisation must have strong institutional support and legal backing within existing sector policy and national/regional/state legislation; and
  - comprehensive training in a wide variety of areas, and on-going training and support is required to build confidence and capabilities within the community organisation.
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### **Participatory Planning and Design of Water Supplies**

Community management of small urban water supplies is only possible when community residents and their organisations initiate and control the water supply planning and design process. The main conclusions regarding participatory planning and design from this analysis are:

- communities need sufficient time and appropriate assistance to identify and define their various water supply and sanitation needs;
- existing community water supplies and sanitation facilities need to be fully assessed and evaluated with regards to their present suitability and opportunities for their future improvement;
- communities need assistance to identify and evaluate an array of options for water supply and sanitation facilities, especially regarding the cost and the operation and maintenance requirements of each option;
- a community-wide process of discussion, negotiation and decision-making is required before a water supply and sanitation plan can be prepared;
- input from external support agencies and government agencies during the design process must be sensitive to, and adhere to the parameters established in the community plan;
- the final plan and design prepared for the community water supply and sanitation facilities must be endorsed by the community-at-large; and
- the participatory planning and design process is frequently non-linear, and support personnel must maintain a flexible and responsive approach in assisting the community organisations.

### **Financial Arrangements To Enable Community Management**

Appropriate financial arrangements are required to enable communities to construct, operate and maintain the water supply and sanitation facilities that they have planned and designed. The main conclusions regarding financial arrangements from this analysis are:

- the level of external and government support for capital costs must be well-defined, and should be flexible enough to accommodate the community's need, willingness and ability to pay for water and sanitation services, and the infrastructure development goals of government and external support agencies;
  - communities are usually prepared to make a significant contribution towards capital costs, either in cash, in kind or in combination, and community labour inputs must be assigned a realistic cash-equivalent value;
  - communities are nearly always prepared to pay the full cost of operating and maintaining the chosen water supply and sanitation facilities;
  - appropriate training and assistance will be required, for a significant period of time, to
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enable community organisations to financially manage and administer their water supply and sanitation facilities; and

- significant opportunities exist for government agencies and the private sector to provide supplies and services to community organisation on a cost-recovery basis.

### **Broad-based Human Resources Development**

Training and institutional strengthening is required at the community, government agency and sector levels to promote community management of small urban water supplies. The main conclusions regarding human resources development from this analysis are:

- at the community level, human resource development is frequently needed in the areas of (1) planning and decision-making; (2) management and administration, and (3) water utilisation, hygiene and sanitation;
- at the government agency level, human resource development is frequently needed in the areas of (1) community development, participation and management, (2) water supply, sanitation and hygiene education integration, and (3) training programme development, delivery and evaluation;
- at the sector level, human resource development is frequently need in the areas of (1) the community management approach in development planning, implementation, monitoring and evaluation, (2) integrated water supply, sanitation and hygiene education, (3) sustainable operation and maintenance of rural and urban water supplies, and (4) collaborative planning and implementation of sector activities; and
- broad-based human resources development is best accomplished by a multi-disciplinary group of trainers, including resource persons from communities, government agencies, external support agencies and non-government organisations.

### **Institutionalisation and Government Commitment to Community Management**

Without proper institutionalisation and a clear and coherent government commitment to community management of small urban water supplies, sustainability is unlikely. The main conclusions regarding institutionalisation and government commitment from this analysis are:

- the first and most important step towards attaining institutionalised community management is comprehensive human resources development at all levels;
- sector policy must clearly support community management, and sector planning and implementation management procedures and practices must embody the concepts of participatory and community-based development;
- appropriate legal, financial and administrative arrangements are required to foster and support community management initiatives;
- institutionalisation is most likely to occur when both communities and especially government agencies perceive that community management offers tangible benefits and

desirable outcomes;

- government commitment must be substantial and long term, since enabling community management requires considerable resources for substantial periods of time; and
- external support agencies must collaborate and harmonise their technical and financial support to the sector, since long term programme support is required instead of short term project support, in order to build capacity for community management at the community and at the government agency levels.

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