



## Strategy for community water supplies

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SUSTAINABLE WATER SUPPLIES in developing countries may seem to be an unattainable goal for the many who have experienced the problems and frustrations of dealing with communities ignorant of the complexities of water supply technology. No matter how simple or complex the technology, failure of the water supply scheme is often only a matter of time once the technocrats have left the scene.

Communities, left to operate and maintain the water supply by themselves, are eventually stumped by relatively simple events, such as the failure of the pump engine, worn glands, or a broken pipe. Then the real problem manifests itself - there is no money to pay for repairs. Communities may even find the water supply technology provided by the donor is too expensive to operate, and the system is allowed to run down through neglect.

Problems such as these can be avoided by applying both business science and engineering science to the development of water supply schemes. In the case of developing communities, direct community involvement during all phases of development is strongly recommended. To illustrate how community-based organisations should approach water supply development, the figure below outlines a strategy that links the project and operating stages of water supply development through the marketing principle of meeting the customers' needs.

### Strategic planning

Water supply development involves two sets of processes, project processes (Block A) and operations processes (Block B), that are linked as shown in the figure.

Step 1 is to determine the customers' needs. Find out what the customer wants and how much he is prepared to pay. If necessary, negotiate options and alternatives as part of the marketing mix (McCarthy and Perreault, p35-48).

Step 2 is the strategic planning process, starting with the mission and culminating in the business plan. Based on what customers want, a mission statement is prepared that will serve as a reference for all future decisions. Then, specific objectives are set and a strategy developed to meet these objectives. The strategy is written down in the business plan, with a budget and implementation programme. (Schutte, p53-88).

In the figure, the broad objectives for water supply development are given by the numbered sequential stages. The strategic planning process is, however, iterative and plans may need to be changed several times before a suitable solution is found that satisfies all the constraints in each development stage. The focus throughout must be

on "customer needs" and Step 8, the generation of revenue from satisfying those needs. (Katko, p202-212).

The delivery system (Step 5) comprises the water source, pumps, treatment works, reservoirs and pipelines required to supply water to the customer. The term "customer" is used deliberately, instead of "consumer", to emphasis the principle of payment for water received.

Water is the product (Step 6) supplied to the customer, who will have specific ideas as to whether the four basic variables in the water supply marketing mix (Step 7) have been satisfied. No satisfaction means no revenue and inevitable system failure once the money runs out.

The cost of operating and maintaining the delivery system must not exceed the revenue that can be generated from the sale of water. Costs are generated through the processes shown in block B in the figure. Small water supplies tend to have low marginal production costs, while fixed overhead costs are relatively high. It makes sense to encourage water consumption up to the supply capacity of the system, since this would bring down the average cost of water, while providing sufficient margins for sustainability, independence and growth of the water supply.

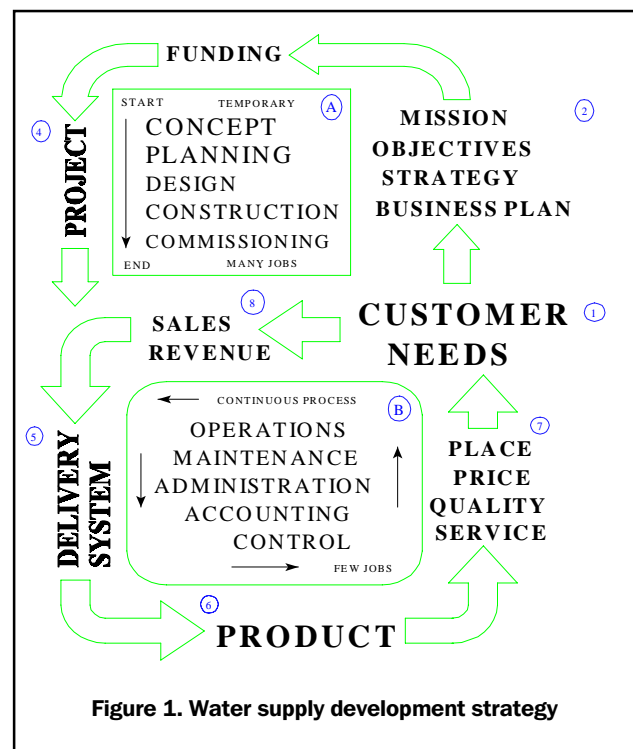


Figure 1. Water supply development strategy

## Community participation

The processes in block B of the figure represent the core business of a water supply, and must be properly managed by trained and skilled people if failure is to be avoided. With developing communities empowerment and participation in the project phase of water supply development is invaluable in generating a sense of ownership, responsibility and commitment within the community, but is not sufficient to ensure sustainability. A community based organization should take on the responsibility of learning and implementing the skills required to manage, operate and maintain the water supply.

All these issues need to be considered in the planning phase of a water project and solutions embodied in the business plan before funding for the project is sought in step 3.

The primary objective of project implementation (Step 4) is to construct the delivery system required to supply water to customers at the right place, price, quality, quantity and level of service - as decided by the customers - not by a design engineer or government agency on their behalf.

Community based organisations are closer to their community customers and better positioned to implement a customer-focused water supply strategy than an externally based organisation. But their weakness is a lack of the knowledge, skills and experience required to effectively manage a water supply utility, and a community that does not understand the issues and difficulties to be overcome poses a threat.

Often when the larger, experienced water supply utilities take responsibility for water supply in a developing area, the imposition of their own strategy and policies may be inappropriate for the community concerned. As a result local capacity may not be developed, decision making is centralised away from the community, customer needs are generalised or ignored and operating costs ultimately increase. However, the real reasons why community water supplies fail are:

- management does not know how to collect revenue for water sales effectively;
- does not control production and overhead costs to within the limits of the revenue collected;
- does not save enough money for the eventual replacement of assets when these wear out or break down.

Effective training of the community-based organisation during the implementation of the initial project will help to eliminate these problems.

## Project implementation

The community organisation must be fully involved in steps 1 to 4 of the project stage of water supply development illustrated in the figure, so that its members share in the mission, objectives and strategy on which the water supply will be founded when taking steps 5 to 8, through step 1, in the operations stage.

Most communities lack the skills required for planning and designing a water supply scheme and could not be expected to learn these in a reasonable time frame. However, the community should be involved in the construction and commissioning phases of the project to the fullest extent possible, with the following objectives:

- To encourage community commitment and a sense of ownership and responsibility for the water supply scheme.
- To maximise cash injection into the community to promote economic growth.
- To learn how to undertake financial transactions and banking tasks.
- To build relationships with suppliers through direct ordering and payment for goods and services.
- To learn how to prepare an income and expenditure statement, a balance sheet and an assets register.
- To learn, from direct experience, how the scheme is constructed and to develop the skills needed for repair and maintenance, as well as the future expansion of the scheme.
- To be in a position at the end of the project phase to take over the management and operation of the water supply scheme.

The dilemma facing a development agency is how to achieve these objectives effectively and at the same time employ experienced outside contractors during construction.

One option is to create a community based organisation with the appropriate structure to implement the chosen strategy (Robbins, p85-100) and then use the experienced outsiders in mentor-ship roles, to train and develop the selected human resources from the community to function efficiently. The necessary skills must be learned during the project phase, so that the transition to the operations phase can take place smoothly.

A key issue is the tendency of outsider agencies to focus on the project phase because that is their job, while ignoring the operations phase because they assume the community or someone else will sort out that part of it.

## Operations structure

While the overall strategy for project and operations phases should be the same, the organisational structures required are different, because the processes are different. However management and financial skills learned in the project phase can be used in the operations phase and will be backed by experience if a community-based construction approach is adopted for the project processes given in block A of the figure.

The following structure is proposed for a community-based organisation tasked with water supply operations and development for the community. A key objective for community organisations is the development of a strategy and structure that encourages goal setting and motivates its members. (Baron, p71-101).

### **Governing Board**

The water committee, representing the interests of the consumers, elected by an annual general meeting of the community, to be non-executive directors of the water supply scheme, to provide guidance on strategies and approve policy and management decisions.

### **Management team**

#### *Manager*

Ex-officio member of the Board, appointed by the Board, to manage the business of the water utility and make decisions on how to plan and implement the strategy.

#### *Accountant*

- To keep the books of the water utility.
- To prepare the balance sheet and income and expenditure statement.
- To keep the fixed and moveable assets registers up to date
- To carry out stock checks on tools, equipment, fuel, spares and materials.
- To collect money from consumers to pay for operating costs.
- To prepare and monitor the operating budget with the help of the Manager and staff.

#### *Storekeeper*

- To keep and control moveable assets.
- To maintain stock levels of spares, fittings, pipes etc., for operation, repair and maintenance.

#### *Clerk*

- To assist the accountant and the manager.

### **Operations and maintenance teams**

#### *Operators*

- To operate the pumps, valves and other controls to ensure the water reaches the consumers.
- To ensure the water is safe to drink.
- To carry out simple maintenance and repair.

#### *Plumbers*

- To carry out repairs and maintenance on all pipelines, reservoirs, stand-pipes and ancillary works.

#### *Mechanics*

- To service and maintain the pumps, motors and engines in the water supply system.

#### *Assistants*

- To assist other staff with their work, as required and within operating budget constraints.

#### *Monitors*

- To help collect money, read water and electricity meters, calculate consumption.
- To regularly monitor the water supply system and report any problems to the appropriate person.

Salaries and operating costs must be provided by the revenue collected from customers. In small schemes, individuals should perform more than one job function to keep busy and save on operating costs. Management should be able to control as many costs as possible. Costs that are outside management's control should be reduced to materials and energy purchases from suppliers.

### **Conclusion**

Community empowerment and the transfer of responsibility for water supply management to a community based organisational structure may be inefficient initially, but with careful planning and commitment by external support agencies, community-based water supply management will be the most effective option in the long run.

The strategy presented in this paper includes and integrates the operations and project processes with the development of a community based organisation, committed to its customers and the cost effective operation of the water supply delivery system.

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