

THE FUTURE OF RURAL WATER SERVICES IN THE DEVELOPING COUNTRIES AND THE GOVERNMENTS' ROLE[†]

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ABSTRACT

The developing countries are facing escalating demands on their limited budgets. Large investments are needed for economic development, transportation, water, housing, education and social programs. The dominant demands are generated by the urban centers where essentially all additional growth is occurring. In the water sector, the capacity of urban services must be immediately expanded far beyond the existing. Given the widening priority demands on the budget the governments must shed funding responsibility for the rural services—even those services in poor condition. Rural customers will have to assume the responsibility in full or lose their services. Forms of service entities and means of financing that have proven to be self-sustaining will have to be introduced. There is ample information on what has and is succeeding under similar conditions in the developing and developed countries. Simultaneously, the governments will have to provide the regulatory and supporting programs to underpin both rural and urban services. Governments and international agencies involved in these matters will have to change their focus from studies, conferences and debates to implementing practical actions. The task at hand and the limited time available offer no options. Copyright © 2005 John Wiley & Sons, Ltd.

KEY WORDS: financing; institutions; irrigation; rural water supply; water rights; water service entities

RÉSUMÉ

Les pays en voie de développement sont confrontés à des exigences de plus en plus grandes sur leurs budgets limités. De gros investissements sont nécessaires pour le développement économique, le transport, l'eau, le logement, l'éducation et les programmes sociaux. Les demandes principales viennent des centres urbains où se produit l'essentiel de la croissance additionnelle. Dans le secteur de l'eau, la capacité des services urbains doit être immédiatement étendue bien au delà de l'existant. Etant donné la priorité croissante de ces demandes sur le budget, les gouvernements sont contraints de se désengager quant au financement des services ruraux—même pour ceux qui sont en mauvais état. Les consommateurs ruraux devront assumer la responsabilité pleine et entière de leurs services ou y renoncer. Des formes d'entités de service et des moyens de financement qui se sont avérés durables devront être introduits. L'information est disponible sur ce qui a réussi et qui réussit dans des conditions semblables dans les pays développés et en développement. Les gouvernements vont devoir fournir des programmes de normalisation et d'accompagnement pour soutenir simultanément les services ruraux et urbains. Les gouvernements et les agences internationales impliqués dans ces domaines devront passer du monde des études, conférences et discussions à celui de la mise en application d'actions concrètes. La tâche à accomplir et le temps limité pour le faire n'offre pas d'alternative. Copyright © 2005 John Wiley & Sons, Ltd.

MOTS CLÉS: financement; établissements; irrigation; approvisionnement en eau rurale; droit d'eau; entités de service de l'eau

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[†]L'avenir des services d'eau rurale dans les pays en voie de développement et le rôle des gouvernements.

INTRODUCTION

A limited number of factors will largely determine the future sustainability of rural water-related services in the developing countries. An understanding of these factors is critical, because with few exceptions, every developing country's services, as a group, will shortly have to become financially self-sufficient.

The exploding urbanization is creating dramatic changes in the demands on the governments' limited budgets. Between 2000 and 2030, the urban population will increase by 1.9 billion (United Nations, 2001). Twenty-four of the world's 30 largest cities in 2010 will be in the developing countries (United Nations, 2003). Housing, transportation, urban infrastructure, energy, health services, education and social programs are a few of the competing needs. Today, governments cannot even meet the UN's Millennium Goals for urban water supply.

Simply stated, governments will not be able, nor will they have the political mandate to continue paying significant subsidies for facilities operation and maintenance (O&M), much less finding funds for new investments in additional rural facilities. The customers will have to take full responsibility for all aspects of providing their services if they are to receive the quality of services that they desire.

The key factors bearing on the sustainability of rural water-related services are interdependent. (The term "water service entities" (WSE) is used in this presentation, because most service providers within a given rural area will render more than one service, only one of which may be water supply.) The basis for customer and WSE investments that depend upon or relate to water deliveries necessitate a firm, permanent, promptly enforced water right. The blend of all services within an area will require the WSE to devise policies, operating procedures and cost recovery mechanisms suitable to the situation. The viability of the WSE is influenced by its financing ability. The financing options available will depend on the provider's legal form. The legal form determines the relationship of the service provider with the country's civil government. And the adequacy of a government's legislation and oversight will determine success or failure.

This paper will outline some basic internal factors that bear on the WSEs' configuration. These include the type of services, form of organization and means of financing. This will be followed by a summary of example WSEs that have long been fully self-sufficient and their common characteristics. The government regulatory and support functions and enabling legislation required as a framework for self-sustaining WSEs that constitute the government's critical role are noted.

THE RANGE OF SERVICES AND RELATED CONSIDERATIONS

In arid regions, irrigation and agricultural drainage services within a defined area are commonly provided by the same WSE. But the services have different characteristics that affect operations, maintenance (O&M) and cost recovery mechanisms. Irrigation services entail orderly measurable water deliveries during the cropping season and ongoing O&M. Drainage services are not measurable in the same sense and entail only occasional maintenance. Storm drainage and flood control have characteristics similar to agricultural drainage, but serve agriculture and villages alike.

The village water distribution and waste management, to the extent the latter is provided, are invariably under the same WSE. However, village supply systems increasingly draw on bulk deliveries from irrigation systems calling for a greater reliability of service and 12-month deliveries compared with service to the irrigators. Some US "irrigation" WSEs provide untreated water to urban residences (Wilkens-Wells and Podmore, 2005). One example WSE in the State of Washington serves irrigation water to 18 000 residential and 500 farm customers, reducing the demand for treated water to the residences. Village waste has other consequences for the agricultural WSE since the waste effluent commonly discharges into drainage or supply systems. This requires close coordination among the area's WSEs.

An area's water supplies may also be drawn from both groundwater and surface water. This already occurs, but in many locations there is little knowledge of the total renewable resources, who is drawing what quantity or which user has priority of use. Over-extraction is widespread—obscuring the true extent of local and regional water shortages. All supply WSEs will have to share information on their operations.

Obviously to be self-sufficient, each WSE must tailor its organization, operating procedures and financing to the range of services called for. The features of such services will require addressing the:

- contrasting categories of services,
- different classes of services,
- operating policies and procedures,
- form of organizational entity,
- cost recovery mechanisms and
- means of financing.

POSSIBLE FORMS OF WATER SERVICE ENTITIES

Six forms of WSEs will be discussed. All of these forms were being applied in many countries by the 1800s, several, many centuries, indeed, millennia before. Yet, the legal basis for some of the most important forms does not exist in a great number of developing countries. This has become more critical with today's service demands, financing needs and environmental and legal considerations.

Government line agencies

The characteristics of WSEs that are part of a government line agency are well understood. These are a unit of the line agency and administratively function similar to the agency's other units. Too often, budget and accounting principles are not clear. Customers have little influence. Unhelpful political pressures frequently arise. The deterioration of services provided by this form of WSE in several countries, usually because of budget constraints, is too common. Constraints on government budgets and other considerations have led to rushed, poorly conceived programs to transfer all responsibilities to the customers without the necessary financial or institutional means made available to the new WSE.

Subunits of government bodies

Isolated WSE subunits of a government body are common, particularly in municipal and village governments, but also linked to a line agency. They report to the government body's administrative head, but their budgeting and financing are fully transparent and clearly isolated from other units. Typically, they can use bond financing for major programs. Annual reports are provided on operations and financials together with audits. This form can be considered as being customer-owned and managed when the WSE is a unit of an elected local civil government with jurisdiction over the same area as the WSE. This is the usual case in cities and towns of the developed and developing countries.

Quasi-government customer-owned

The quasi-government form, commonly referred to as a "district", is perhaps the most promising for creating a sustainable services sector in rural areas. It is a customer-owned WSE, governed by an elected board of directors fully isolated from civil government. Budgeting and financing are transparent. One key feature is the power to levy property taxes and issue bonds for financing major programs. All associated financial obligations remain with the WSE and its members and cannot be transferred to the government or to other taxpayers.

In many countries, this "district" form is used for parks, public schools, irrigation, drainage, flood control and almost any function that a group desires. Districts serve much of the US irrigated lands. Combined water, sewerage and electricity districts, independent of civil government, serve cities as diverse as Quinca, Ecuador, and Eugene, Oregon. The policies set forth for the United States Bureau of Reclamations required the formation of such customer-owned districts by the local landowners to be served, before construction would commence on an irrigation project—though not followed in all instances.

On a larger scale, the Metropolitan Water District of southern California (MWD) was created in the early 1930s by major cities and numerous small irrigation districts in that region. MWD provides bulk supply to augment the initial sources still owned by the individual member WSEs. Today it serves most of the population of southern California.

An example irrigated valley in Peru developed in 1923, and has a similar WSE that provides bulk supply to five independent distribution districts serving 16 000 ha. The distribution districts own, and their officials serve as the board of directors for, the umbrella district bulk supplier. Such umbrella WSEs have historically served local irrigation districts covering 50% of Peru's current irrigated area. Unfortunately, these WSEs do not yet have taxing powers.

Administered quasi-government customer-owned

Stand-alone flood control and drainage WSEs may also be structured as quasi-government entities with all the same virtues. But in cases where there are only limited operations and only intermittent maintenance, the WSE may be "administered" by an independent government office. A district judge or a county board of directors are commonly used in the US. Members still retain their voting powers and financial responsibilities, but these administrative offices provides the point of contact and a focus for decisions by customers when resolving internal issues. This form of drainage district protects many millions of hectares of agriculture in the Midwest, eastern and southeastern US. Europe, Asia and other regions devised similar forms for this purpose much earlier.

Nonprofit mutual companies

The nonprofit customer-owned mutual companies are a form of WSE that follows state laws in the US. Many predate the "districts" laws. The customers purchased shares in proportion to the water service they desired and are assessed annual costs of O&M prorated in proportion to the number of shares owned in an amount as deemed necessary by their elected board of directors. Early settlers often paid for shares by providing construction labor. (Local bonds have also been used to fund large investments.) Individual WSEs may store or distribute water, or both. Hence, many farmers invested in more than one type of WSE in order to best meet their individual needs, particularly as additional water sources became scarce.

But older unincorporated forms of WSEs equivalent to mutual companies are common in both developed and developing countries. The larger unincorporated form may be governed by a committee selected by an assembly elected by the owner/customers. The customers' ownership of "stock" and assessment of costs are usually proportionate to the quantity of service received using irrigated area as a proxy. In Nepal and North Africa, for example, even the priority rights for water diversions by such WSEs from the same river were established centuries ago and are respected by the more recent diverters and by new lands served by the existing systems. This occurred later in the US. (The role of water rights will be discussed later.)

Private sector for-profit

Private sector providers are a for-profit form of WSEs that is owned by investors. Many are local well operators or they pump from a surface water source and charge for the services consistent with local customs. Larger providers are subject to the applicable business laws, particularly the equivalent of a utilities commission. However, large long-term WSEs of this form are rarely found in rural areas today. Under the guidance of international agencies, China and Vietnam are experimenting with various modifications of private entities. However, their long-term success is yet to be established and many do not have the oversight applied to proven privately owned WSEs.

POSSIBLE FINANCING MECHANISMS

The sources for financing WSE operations, maintenance and capital expenditures that may be available, depending on the form of WSE, include:

- service charges,
- government subsidies,

- government loans,
- commercial bank loans,
- member assessment,
- general obligation bonds and
- property taxes.

Underpinning all financing mechanisms is the willingness of customers to pay promptly for the full cost of their services. As will be discussed, a characteristic of all self-sustaining WSEs is the unquestioned acceptance of this principle by all their members. Service charges will be the primary source of WSE funds to pay for O&M and short-term loans. Any present government subsidies will disappear. Government loans will be limited in amount and likely provided only for rehabilitation. And as with commercial loans, all such loans will depend on the WSE's record of customer payments of service charges. (The political reliability of any existing government subsidies will influence the availability and cost of even short-term lending.)

Two financing mechanisms, general issuance of obligation bonds and the power to levy property taxes, are only available to the quasi-government forms and to some government forms of WSEs. It is these financing characteristics of the quasi-government forms of WSE that make this form preferable and should be made available in all developing countries. The means to issue obligation bonds greatly facilitate financing major investments, while the power to levy property taxes ensures a source of revenues adequate to cover the loan/bond obligations as well as covering general administration and routine costs during periods of reduced revenues caused by economic downturns and weather conditions. Importantly, this form can access domestic, lower-cost sources of financing helping countries meeting the objective of financial self-sufficiency. Marshalling domestic savings, rather than using international sources, should be a parallel objective. Revenue bonds may be available to WSEs that own hydro-facilities as a part of their system.

Property taxes, or the equivalent assessments, are the common means for recovering the costs of flood protection and storm drainage services. Payment in labor is used in several countries.

It should also be noted, however, that access to substantial and longer-term lending by all forms of WSEs will depend upon the status and ownership of the WSE's water rights. Ownership of rights will have to reside with the WSE or with the landowner members coupled with a dedicated use granted to the WSE. The legal ability to transfer water rights out of the WSE risks imposing economic and financial costs on other members and even the self-sufficiency of the WSE. One of the reasons for US irrigation WSEs offering irrigation supply to residential developments on district lands is to retain the water rights within the district's service area and ensure the viability of the WSE and its remaining farm customers.

CHARACTERISTICS OF PROVEN SELF-SUSTAINING WSEs

As mentioned earlier, the most important step when considering the creation of a new WSE or strengthening an existing one should be an in-depth evaluation of the characteristics of successful WSEs. This seems obvious, since the physical characteristics of water and land and the desired services for their use have not changed. Yet, many failed efforts to establish new WSEs in recent times have relied upon new institutional theories and an inadequate understanding of the basic factors involved in providing a service.

The characteristics of long-established self-sufficient WSEs are described in great detail in some of the literature. Of particular value is the in-depth analysis regarding the irrigation WSEs developed in Spain during the Middle Ages and in California and the Rocky Mountain states beginning in the 1800s (Maass and Anderson, 1978/86). The average farm sizes in the described examples ranged from less than 1 ha to over 50 ha. The degree of sophistication and type of infrastructure in these successful WSEs vary widely. Indeed, the operation of most older schemes is far more complex than many recently built systems. Additionally, the analyses also describe the water rights and operational interrelationships among WSEs within the same basins.

An analysis of the centuries-old "mountain resources management" entities of Japan and Switzerland together with agreements among WSEs created 50 years ago to manage overcommitted groundwater basins in southern California is

a second source of information (Ostrom, 1990). The fundamental characteristics of the community management of the mountain resources are remarkably similar to the irrigation schemes described in both publications.

The most consequential characteristics of self-sustaining WSEs are universal and should be fully understood whenever consideration is given to creating a new WSE. The primary and overriding objective of every group of potential customers/beneficiaries is to obtain a reliable right to use or manage a renewable resource by its members in an equitable manner. The sustainability of the individual members' endeavors hinges on attaining this objective. In every case pertaining to water supply, a recognised Water Right issued to the WSE with an established priority [of use] relative to other groups drawing from the same source together with the physical access by all members of the WSE were basic to the WSE's success. The importance of this characteristic cannot be overemphasized, yet a majority of newly created WSEs under transfer programs and WSEs created for serving newly developed lands have violated this basic principle.

A second objective of these established WSEs was to be local entities, independent of civil government, within which only customers/beneficiaries have a vote directly or indirectly on all matters. The members of their representative councils and executive board of directors are likewise customers/beneficiaries, as are administrative staff, unless the individual functions are full-time and personnel are employed by the board.

The members decide the operating policies, the details of the services under all potential conditions, the governing rules, the internal procedures and the penalties for infractions. Commonly, the members themselves, or WSE employees, monitor member actions for compliance. The members formulate these provisions in a manner deemed best for their particular categories and classes of services, the hydrology of supply, the extent of drainage and like factors. The focus remained on how to best meet the group's needs with a means to ensure equitable services to every member. They did not attempt any other production or commercial activities or efforts to earn money to augment their WSE budget.

Another principle reinforces the independence of the WSE from civil government and meets the members' objective of the prompt remedy of any misbehavior by a member. An internal body, consisting of elected WSE members, evaluates customer complaints and promptly applies penalties and remedies under established procedures. In very few instances are civil government bodies ever involved in these matters.

These self-sufficient WSEs have survived without intrusion or interference from civil government bodies—fighting off or even ignoring legal efforts by civil government to engage in the WSEs' functions. The only role of civil government is to monitor compliance with appropriate national or provincial laws.

Service charges and assessments for rehabilitation and new construction are set by the board to cover costs and are levied according to benefits—in most cases the land area served is a proxy. All WSEs are nonprofit. As evident in the history of self-sustaining WSEs, it is neither the configuration of the physical facilities nor the relative complexity of services/operations that determine success.

A limited range of organizational forms may be applied in a given country. As evident in the history, member-ownership is essential. And only four forms are member-owned: quasi-government districts, administrated quasi-government districts, mutual companies, and fully isolated subunits of local elected government.

Other sources of material on the creation of WSEs also reflect experiences of WSEs in developed and developing countries and may be of use. Two utilize such information in devising a sequence of steps to form a WSE and discuss related service pricing issues (Frederiksen and Vissia, 1998) and ICID (Tardieu, 2004).

GOVERNMENTS' REGULATORY ROLE

Today, population continues to grow, use of water continues to increase and environmental goals place additional demands on countries' resources. As a result, governments have to meet several responsibilities to ensure success of the WSEs. One, the regulatory, bears most directly on their success. Indeed, the lack of effective government regulatory capacity is a primary obstacle to creating self-sufficient WSEs in developing countries. Issues of water rights, pollution control, fiscal behavior, financing and transparency that cannot be addressed by local customs are increasingly common. Yet, many governments in developing countries have not taken the necessary actions. Some of the most important regulatory functions are noted below.

Water rights system

Countries must have a system of surface and groundwater rights with an aggressive administration. This constitutes the basic accounting system of a country's resources. Without an assured supply, users and WSEs cannot risk capital investments. Licenses, records and river masters are some of the essentials for effective administration.

Pollution control system

The disposal of urban and village waste should be in a manner that precludes permanent pollution of groundwater and surface water and prevents health problems. This requires comprehensive, enforced pollution control regulations. Countries and their WSEs are effectively losing both groundwater and surface supplies due to severe pollution over large regions. Ultimately, rural customers are directly affected by urban demands for replacement supplies, while health issues are rising and creating additional human and economic costs to the countries.

Well construction

Comprehensive regulations for well construction, use and abandonment backed by enforcement are essential for effective water resources management, sustaining water rights and protecting the aquifers. Large volumes of storage located in the immediate areas of use are being lost annually. Waste disposal on overlying lands aggravates the situation. Areas under and adjacent to Beijing, Ho Chi Min City, Sacramento and rural areas of Europe offer example consequences of inadequate attention.

Audits

Independent audits of WSE operations and fiscal matters instill confidence in both WSE members and lenders. They help to prevent fraud and crippling losses. Ecuador requires such audits of WSE subunits of government—though the frequency called for is not enforced because of funding limits. (In many countries, the audits are conducted by the private sector; however, adequate oversight of these firms is essential.)

Securities commission

An independent securities commission should evaluate the viability of a WSE's plans for financing major infrastructure investment if they involve public bond financing. This function gives greater confidence in this type of financing by WSEs throughout the country. California had a state agency with this responsibility until recently, but now relies on the commercial bond rating agencies that serve the markets, which has proved successful.

Utilities commission

Though private investments in rural services will likely be limited to small WSEs, any significant ventures, being a monopoly, will require the equivalent of a government utilities commission. They should be formed in advance if any services are to be privatized in order to avoid problems such as those encountered in the UK where it has taken many years to refine their equivalent for the urban sector, in spite of a long history of law.

GOVERNMENTS' SUPPORTING ROLE

Timely comprehensive water resources plans updated at five-year intervals at every level of civil government form the most effective basic framework for sound management of a country's water resources. They set forth the resources, demographics and projections of the future. The plans outline the physical facilities and programs for the management of the resources. The plans document the present use, commitments of resources and the

unresolved issues. They reflect governments' social, resource use and environmental policies and legislation. These plans coupled with the other stewardship functions—regulatory and data collection—are the foundation for the formulation and operation of the water-related services; the other group of functions that jointly with stewardship, constitute water resources management. By the country's constitution and the nature of these activities, government has this responsibility and only government can execute it.

Obviously, it will take time to implement the planning function described. Its urgency depends on the condition of the resources. However, planning should be vigorously pursued, unless the country has excess resources. It is not a luxury, but a body of information that can help avoid ineffective investments and costly emergency shortages.

The regulatory responsibilities were discussed in the preceding section. The remaining support function is data collection. This is essential for both the planning and regulatory functions. It is of immense help in the long-term and real-time planning and operation of the WSEs.

The priority government actions to effect these responsibilities of support for the services sector entail the enactment of the body enabling legislation, the creation of associated institutions (including the legal provisions for independent, financially self-sufficient WSEs), the employment of well-trained staff and a reliable consistent budget. As evident in the discussions, the comprehensiveness of the enabling legislation, institutions and budgets directly influences the health of rural water-related services.

CONCLUSIONS AND RECOMMENDATIONS

Many developing countries launched large rural development programs in the mid-1900s. Line agencies were selected as the sector advocates, the developers and the service providers. Few of these WSEs ever became self-sufficient. Henceforth, however, governments' financial means that were available at that time will be diverted to other more pressing demands.

The governments in the developing countries must create the foundation for self-sufficient WSEs. The shifting objectives, the condition of service systems and mix of services required today necessitate that governments dramatically strengthen their regulatory and supporting framework for the WSE sector. A delay in these actions risks the collapse of a healthy, viable rural community.

Yet, as is evident, governments in many developing countries do not see the need for such actions. Part of the reason is that most international agencies offering advice on improving WSE performance do not identify the package as essential. In spite of the Millennium Development Goals and the international agencies' push to transfer service systems to customer-owned or private investor-owned WSEs, these actions remain orphan programs.

There are an ample number of examples of functioning self-sufficient WSEs, laws, data collection programs and regulatory systems available for consideration. No lengthy studies are needed. It is a matter of action.

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