

# Institutional Framework of Small Community Water Supply Systems in the United States

## A Review of Experiences and Lessons for Developing Countries

by Gordon Tamm  
with the assistance of Sarkis Garabedian



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KN 8693  
202.2 901N (202.2911N)



**UNDP-World Bank Water and Sanitation Program**

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and Development/The World Bank  
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Washington, D.C. 20433, U.S.A.

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## **ABSTRACT**

**This paper examines rural water supply systems (RWS) in the United States and evaluates the relevance of findings for developing countries. It focuses on the institutional and regulatory framework that governs RWS in the United States by examining the organizational and procedural characteristics of national and regional institutions, such as the Farmers Home Administration and the Rural Water Association and its state affiliates. The working relationship between these institutions and community associations is also discussed and illustrated by data from field observations made in Mississippi and Texas. Issues addressed include financial and technical management and extension and training services.**

**The paper singles out as the most conspicuously effective features of the United States' RWS experience (1) the local initiative and community mobilization required for the formation of a local RWS system for funding by the Farmers Home Administration (FmHA), and (2) the circuit-rider system for providing RWS systems with professional expertise, as developed and executed by the Oklahoma Rural Water Association.**

**Insights gained from the United States' experience are then considered from a developing country perspective. The paper concludes by drawing on specific parallels and differences between the developed and developing country contexts to propose a model for a RWS demonstration program suited to a development setting.**



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## PREFACE AND ACKNOWLEDGMENTS

In a way, this study is an experiment. For more than 30 years, most well-intended but (frequently) ill-founded efforts to transfer lessons and institutional structures from the industrialized world to developing countries have failed, sometimes with disastrous consequences. To attempt yet another transfer, this time in the field of rural water supply, may very well appear to be an exercise in futility.

In order to avoid past mistakes, we have tried to analyze some of the givens of rural water supply in developing countries, questioning entrenched beliefs and expanding the range of feasible possibilities. This study is part of a larger research (and search) program launched by the World Bank's Water and Sanitation Division, Infrastructure and Urban Development Department, to explore and solidify the underpinnings of Bank involvement in rural water supply.

We thank Messrs. David Grey, Michel Pommier, and Dennis Warner of the World Bank. They commissioned this study and prodded us along with searching questions.

Throughout the study, we have greatly benefited from assistance and friendship given by a large number of persons. Rob Johnson and all his colleagues at the headquarters of the National Rural Water Association (NRWA) endured our never-ending ignorance with brave smiles and patient explanations. We sincerely believe that if the spirit, competence and commitment that permeate the NRWA could be exploited within the framework of international development cooperation, a great contribution would be made.

In Texas, Mr. Charles Hart and his colleagues at the FmHA gave us a great deal of assistance and support. We also acknowledge the helpful approach and commitment displayed by Mr. Charles Lockhart of the FmHA in Mississippi.

In particular, we thank the operators, managers and Board members of all the systems throughout the Mississippi Delta and Texas that we had the opportunity to visit. No models or approaches can substitute for the personal commitment and integrity of these persons.

During our field visits, Mr. Pete Boone and Mr. David Sneed proved the strength of the circuit rider approach: the confidence shown in them by local system operators was matched by the confidence they themselves had in the operators.

Our deepest thanks go to Steve Fite for his continuing support throughout the study.



## I. INTRODUCTION

### Background and Purpose

The considerable experience gained from rural water supply (RWS) in the developing world appears to underline the importance of **management and institution building** as critical factors in determining the long-term viability and sustainability of water supply installations.

**Community management**—a term emphasizing local involvement, community empowerment, cost recovery, community ownership and responsibility for operation and maintenance (O & M)—has been put forward as a necessary element of ongoing and future interventions if sustainability is to be achieved. However, lack of specificity, which in part is due to a corresponding lack of successful examples, has made this approach as much ideological as operational, as much guided by beliefs as by practical considerations. Consequently, rural water supply services in developing countries are frequently left with no management and supportive institutional framework at all. This managerial "vacuum" has increasingly been a primary reason why huge investments in RWS have gone bad, and it explains the seeming impasse in new policy formulation. Systems fail, buckets are passed around, blame rather than water is apportioned liberally all the way down to the hapless would-be consumers.

The United States provides what may be the most explicit, ongoing, and large-scale example of a community-centered approach to RWS, emphasizing cost recovery, sustainability, and operational viability with minimum government involvement.

The purpose of this study is, hence, to review achievements of the United States for relevant guidance for RWS interventions in developing countries. The study falls within the larger research program launched by the World Bank in its ongoing efforts to support the rural water supply and sanitation sector.<sup>1</sup>

The approach is, by definition, exploratory. It focuses on small RWS systems in poor areas of the United States (Mississippi and southern Texas) and relies on information gathered during field visits to individual systems, interviews with representatives of relevant bodies and agencies, and background documents. The intent of the study is not to evaluate institutional arrangements for community water supply in the United States but rather to highlight relevant lessons learned and underscore their applicability to developing countries.

The study was carried out in close conjunction with, and parallel to, continuing efforts on the part of the National Rural Water Association (NRWA) to assess the relevance of its own experience for developing countries.

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1. UNDP-World Bank Water and Sanitation Program, "Sector Issues and Research Program 1988-90," September 1988.

With the focus on **community management** as a core feature of the sustainability of small rural water supply systems, key issues dealt with during the study included:

- ▶ Funding, finances, and overall economics;
- ▶ Choice and range of technology;
- ▶ Outreach and coverage;
- ▶ HRD, training, and capacity formation; and
- ▶ System and sector information and monitoring.

The basic yardstick against which these issues were reviewed was the relative importance played by **government, community, and consumers and the market economy and private interests** in creating and sustaining the viability of small rural systems.

### **Limitations and Constraints**

This study is not an attempt to review the rural water supply sector in the United States as a whole. It is focused on aspects that seemed most pertinent to the situation in developing countries and examines that part of the sector which has evolved out of a conscious government policy and institutional framework. Specifically, the focus is on small systems, on community management, and on systematic and explicit government efforts to support and/or promote these. In the context of the United States, the review is primarily confined to the framework and momentum of those systems that have come into being as part of the Farmers Home Administration (FmHA) program. Whenever mention is made of "the United States' experience," it should be understood as referring to the specific subset touched or supported by the FmHA.

Another limiting factor is that only water supply is addressed: wastewater disposal and sewer systems are not included. The reason is not that the problems surrounding sewerage and sullage are not relevant for developing countries, but that the time required for exploration into this area was not available.

The issue of relevance was therefore in part predetermined, and it may indeed be that other aspects of the United States' experience are equally (or more) pertinent from the perspective of developing countries. From the viewpoint of community management, the focus on FmHA-supported systems is appropriate.

The most serious constraint, apart from the exploratory nature of the study itself, was the unavailability of data at the system level and for the RWS sector. This factor, compounded by a reluctance within the sector to collate and compile data for planning and monitoring, stands in stark contrast to the demands usually put on developing countries as a condition for financial or technical collaboration.

For obvious reasons, the time constraint under which this study was carried out<sup>2</sup> also imposed restrictions of its own: priorities had to be set that to those actively involved in promoting rural water supply in the United States may appear to be wrong or to distort the country's experience. Again, however, it should be stressed that it is the developing country perspective that guided the study, not the United States' experience as such. Points or aspects may therefore have been accorded a prominence in this study that seem disproportionate from a purely United States viewpoint.

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2. The study was carried out between October 12 and November 11, 1988. It included two weeks of research in Mississippi and Texas, two weeks at the NRWA Headquarters in Duncan, Oklahoma, and one week in Washington, D.C.



## II. AN OVERVIEW OF THE RURAL WATER SUPPLY SECTOR IN THE UNITED STATES

A national problem does exist for small water systems. The majority of small systems are poorly managed due to (1) lack of understanding of the water supply function, (2) lack of technical training, (3) inappropriate rate structures, (4) lack of access to capital, and (5) no economies of scale.<sup>3</sup>

Deficient capital, unskilled management, slipshod accounting and book-keeping, unreliable operations and maintenance, substandard water quality, poor customer service, noncost-based rates and ill-prepared rate case applications—a large proportion of the thousands of small water utilities in the United States may have some or all of these problems.<sup>4</sup>

These observations are two of many similar ones found in official or semiofficial assessments of the small rural water supply systems in the United States. They certainly raise fundamental questions in relation to this study: To what extent, and/or in what respect, have efforts to create and sustain small rural water supply systems been successful in the United States? Can any positive lesson be distilled from the United States' experience? It goes without saying that failures and mistakes are as potent learning material as success stories, but it is hardly lack of failures or shortcomings that plagues most developing countries.

There are two ways to try to answer the questions posed above. First, available information on the overall situation, scarce though it may be, provides insight into historical trends and the aggregate situation through quantitative indicators for small systems in operation, revenues, compliances with standards, and so forth. Second, the more qualitative aspects can be understood by contextual assessments at the system level, particularly those systems located in poorer regions of the United States. In this chapter and in Chapter 3, an attempt is made to review the overall picture, and Chapter 4 discusses observations made during field visits to systems in Mississippi and southern Texas.

### History

With few studies to lean on, a historical overview must, of necessity, be somewhat subjective. Considering the scale and momentum of rural water supply in the United States and its stress on community management and sustainability, a study of its evolution would in itself be a worthwhile undertaking. Not only would such a study throw light on ongoing global RWS efforts, but it would also have a direct bearing on problems now confronting small rural systems in the United States itself.

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3. National Council on Public Works Improvement, *The Nation's Public Works: Report on Water Supply*, May 1987.

4. The National Regulatory Research Institute, *Commission Regulation of Small Water Utilities*, 1984.



In rural areas, modern community-type systems probably started to develop around railroad stations and mining camps. These were usually a single well with a raised tank and a few taps. In time the systems were expanded, with pipes carrying water to houses and commercial institutions. A long time passed, however, before the rural areas obtained city-level service, that is, good quality, safe water in sufficient quantity and with sufficient pressure. In fact "city water" came to be the term frequently employed in rural areas to describe this service. And it is this extension and consolidation of "city water" that is the object of this study.

For the purposes of this study, the United States' experience can be viewed in four phases:

- Phase 1: *Prior to 1930.*** Until the 1930s RWS remained largely outside the orbit of government policy, with official concern for water supply being synonymous with urban conglomerates. The situation was one where there existed a wide range of private, individual water supplies and a few organized public supply systems in economically important rural centers (such as railroad junctions). The availability of water was one of the most important determinants of spatial demography in rural areas.
- Phase 2: *The Great Depression.*** The early 1930s saw, or forced, the first coherent formulation of a rural development policy, implying, among other things, that public funds were made available for rural water supply, particularly to drought-prone areas. However, such concessional credit remained limited and confined to farming communities rather than to the rural areas as a whole. The main beneficiaries of this policy were the larger, more nuclear, rural centers; the bulk of the scattered population and small communities still had to rely on private initiative.
- Phase 3: *The Mid-1960s.*** Not until the "Great Society" associated with the Johnson administration was a more broadly based public policy towards RWS launched. It had the twin objectives of complementing local and commercial efforts, and of increasing the social outreach and coverage. The spearhead of this policy was the Farmers Home Administration (see Chapter 3, "Public Funding of RWS"). Through this agency, the government expanded its area of support into community utility and asset formation for rural areas as a whole. This was accomplished by providing low-interest, long-term loans for low-income areas coupled with grants for community RWS systems. In less than 20 years this government-sponsored, community-centered, and commercially oriented policy assisted in making "city water" (domestic piped water) available to a majority of rural households. As if in confirmation of this policy, the Safe Drinking Water Act was passed by Congress in 1975. However, throughout this period, emphasis was almost exclusively on creating facilities rather than on water quality standards. This was particularly true for the smaller rural systems.
- Phase 4: *1986 onward.*** The small rural water systems thus created tended to be very sensitive and vulnerable to regulatory interventions. With the passage of the Amendment to the Safe Drinking Water Act (SDWA) in 1986, the RWS sector

entered a new and considerably more uncertain phase, at least as far as community management and cost recovery were concerned. This act redefines public policy toward the RWS sector and changes it from a policy of government assistance in making domestic rural water supply available, to one of active government intervention in enforcing drinking water standards. The act provides for mandatory testing for and monitoring of a large number of chemical constituents in the water, even in small rural systems. This, more than the expansion of "city water" itself, is likely to be the real touchstone of the RWS sector in the United States.

The interest of this study lies primarily in the third phase, the period from the mid-1960s to the early 1980s when the momentum of a community-managed RWS was successfully created and sustained.

One outstanding feature in the historical evolution of the United States' RWS sector is that of the government's **responding** to pressures and political demands from the rural and agricultural communities, rather than itself taking a lead in promoting and/or satisfying an implicit need. This should not imply that the government has been a passive partner; on the contrary, massive subsidies have gone into the sector (see Chapter 3, "Technical Assistance"). However, it does highlight the equally striking absence of a specialized government agency—a "Department of Water Supply"—which is frequently a prominent actor in most developing countries.

Similarly, there does not exist in the United States a policy per se for rural water supply, one that frames, for example, objectives of coverage, water resource management, and government responsibilities.<sup>5</sup> The policies that exist make up the conditions under which the government can support the establishment of rural systems, the quality standards that should apply, and the regulatory and enforcement procedures that may be enacted in case of noncompliance by individual systems.

This lack of RWS policy has tended to generate two incompatible approaches: an "outreach" approach focused on the rural poor, on drinking water as a basic need, and on community mobilization, and an "operational" approach concentrated on the rural population at large, on drinking water as a commodity, and on community management. In the former approach, grants and subsidies were viewed as instruments for social outreach, whereas the latter approach defined them as instruments for achieving economic feasibility. These two approaches never crystallized to the point of overt policy alternatives, except, perhaps, in the form of the different perspectives of the National Demonstration Water Project and the National Rural Water Association, discussed below. Nevertheless, the wide discretionary power accorded FmHA field units has made it possible to accommodate both, at least in principle.

Another way of describing the nature of this nondirective government role is to say that the momentum and approach of the RWS sector are a reflection of rural society—its economy, polity, infrastructure, communication, resources, etc.—rather than of any conscious policy to structure and promote RWS. This immediately brings into focus the trite but inescapable observation that the basic driving force behind the sustainability and

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5. See National Council on Public Works Improvement, *Report on Water Supply*, pp. 205-206.

momentum of small rural water supply systems in the United States is the society itself, a statement that severely circumscribes most notions of replicability or transferability of United States sector achievements.

### Statistical Overview

The information base for RWS in the United States is very weak, and this weakness implies that there were no reliable data available on the situation at the time the FmHA began assisting the sector in a more concerted way. The existing data do not seem to have been collated and compiled for easy reference. Therefore, comprehensive information on the number, type, extent of reach, and coverage of rural water supply systems could not be located. The periodic (but methodologically inconsistent) surveys that have been undertaken, however, do permit a general assessment of the development and current situation of water supply in the country along with the institutional framework within which the systems operate.<sup>6</sup>

The latest official estimates of community water systems are given in Table 1. The estimates cover all water systems that fall under the regulatory mandate of the Environmental Protection Agency: all systems having more than 15 connections or serving more than 25 persons.

As can be seen, the vast majority of the systems are very small, with more than 87 percent serving fewer than 3,300 people per system. It is primarily this group that concerns us here, and in particular those systems serving populations under 500.

Looking at the ownership structure, one finds that the smaller the systems, the larger the proportion of those that are privately owned. Table 2 provides an overview of ownership structure for different-sized systems. The figures are for both 1986 and for 1980, the latter in parentheses. These figures are estimates based on surveys, and it is difficult to compare them over time since they are methodologically inconsistent.

The particular group of systems of interest to this study are those owned by homeowner associations (marked in bold above). These constitute the core of the systems supported by the Farmers Home Administration, and to which the concept of "community management" applies. It is true that a large number of the systems owned and operated by local and municipal governments are also supported by public loans and grants.

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6. Because of difficulties in reconciling the different surveys, longitudinal assessments are extremely difficult to make and are not attempted here. The comparison made in Table 2 between the 1982-1980 and 1987-1986 EPA surveys should not be understood as more than broadly indicative.

TABLE 1

## Distribution of Community Water Systems by Size

System size (population served)	No. of CWS	Percent of CWS	Population served (million)	Percent of popu- lation served
< 500	37,420	63.5	5.5	2.4
501-3,300	14,132	24.0	19.3	8.5
3,301-10,000	4,203	7.1	24.0	10.6
> 10,000	3,153	5.4	177.2	78.5
<b>Total U.S.</b>	<b>58,908</b>	<b>100.0</b>	<b>226.0</b>	<b>100.0</b>

Source: The National Public Water System Program, FY 1987 Compliance Report, United States Environmental Protection Agency, October 1988 (draft).

However, in formal terms they differ only in scale from larger urban systems, and the concept "community management" does not really apply to them, however much they may resemble the private or community-owned systems.

A summary of some of the surveys and assessments carried out reveal broad characteristics of smaller water supply systems:

*Capacity and consumption*

- ▶ Small systems are generally oversized, with peak or maximum daily production two to four times the daily production (compared to 1.5 times for the larger systems).<sup>7</sup>
- ▶ Median daily household consumption is 660 lpd, median per capita consumption 230 lpd; there is no discernable trend in the data across system size.<sup>8</sup>

7. EPA, *1986 Survey of Community Water Systems*, 1987.

8. EPA, *National Statistical Assessment of Rural Water Conditions*, 1984; EPA, *1986 Survey of Community Water Systems*, 1987.

TABLE 2

## Ownership Structure of Community Water Systems, 1986 and 1980\*

Ownership structure	Population					
	25-100	101-500	501-1,000	1,001-3,300	3,301-10,000	> 10,000
<b>A. Public</b>						
Local or municipal government	1,372 (1,502)	5,203 (6,696)	3,702 (4,915)	5,761 (6,529)	3,900 (3,316)	3,310 (2,411)
Federal government	153 (142)	213 (582)	75 (100)	70 (0)	50 (138)	94 (42)
<b>B. Private</b>						
Investor-owned	1,915 (3,393)	2,654 (3,233)	889 (729)	1,168 (723)	605 (285)	468 (216)
Homeowners associations	2,300 (3,170)	2,316 (1,371)	607 (188)	710 (170)	206 (56)	25 (19)
Other	329 (1,130)	159 (294)	57 (259)	93 (170)	3 (56)	39 (7)
<b>C. Ancillary</b>						
Mobile home parks, hospitals, institutions, schools, etc.	8,264 (11,333)	4,743 (5,574)	600 (-)	286 (-)	5 (-)	5 (-)
<b>Total</b>	<b>14,333</b> <b>(20,680)</b>	<b>15,289</b> <b>(17,750)</b>	<b>6,032</b> <b>(6,191)</b>	<b>8,050</b> <b>(7,592)</b>	<b>4,860</b> <b>(3,851)</b>	<b>3,946</b> <b>(3,007)</b>

\* 1980 data in parentheses.

Sources: 1986 Survey of Community Water Systems, EPA, 1987; Summary of Operating and Financial Characteristics of Community Water Systems, EPA, 1982.

### *Revenue and finances*

- ▶ Revenue rates in 1986 averaged around \$2/1,000 gallons, with small systems having approximately twice the rate of the larger systems.<sup>9</sup>
- ▶ Revenue/delivery (cents/1,000 gallons of water sold) and operating expenses are high and fairly stable over systems covering populations of 25 to 25,000; they then drop steeply and are stable over larger systems.<sup>10</sup>
- ▶ Small systems frequently operate at losses, and publicly owned systems experience greater losses than privately owned systems.<sup>11</sup>
- ▶ Ten percent of the small community systems received less in revenue than was allocated to O & M and debt retirement and servicing.<sup>12</sup>
- ▶ Three quarters of all rural households paid less than 1 percent of their gross income for drinking water.<sup>13</sup>

### *Level of service*

- ▶ Few rural households report shortage of water. In 1984, 80 percent were estimated to be completely satisfied with their existing supply, and another 16 percent reported that their system usually or always provided sufficient water; at the same time, more than 700,000 households were estimated to face acute drinking water problems.<sup>14</sup>
- ▶ One half to three quarters of all small systems did not have a professionally certified operator in 1986; approximately 80 percent of the small systems had only a part-time operator.<sup>15</sup>

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9. EPA, *1986 Survey*.

10. *Ibid.*

11. *Ibid.*

12. EPA, *National Statistical Assessment of Rural Water Conditions--Technical Summary*, 1984.

13. *Ibid.*

14. *Ibid.*

15. EPA, *1986 Survey*.

### *Quality of service and consumer behavior*

- ▶ In 1987, 95 percent of all serious cases of noncompliance with EPA water quality standards occurred in systems serving fewer than 3,300 persons.<sup>16</sup>
- ▶ In 1983, 66 percent of the rural population rated their present water supply as equal to or better than their ideal water supply.<sup>17</sup>
- ▶ Taste was the most important quality factor identified by rural consumers.<sup>18</sup>
- ▶ Unit cost of water was the most important determinant of water volume consumed; nevertheless, households connected to private systems had a 50 percent higher consumption level than those connected to public systems.<sup>19</sup>

These findings must be taken with a great deal of caution, but they appear to confirm that small rural systems continually face serious problems. They also reveal that the level and quality of service provided are judged to be generally acceptable by the consumers.

### **Problems and Issues**

From the perspective of the surveys, three major issues emerge: **economies of scale, public versus private systems, and (to a lesser extent) choice of technology.**

#### *Economies of scale*

One of the criticisms often directed against the proliferation of small systems that the FmHA approach has encouraged is that it has generated considerable diseconomies—in scale as well as in technologies. Much of this is built into the approach itself: for example, there are no operational master, national, or regional plans for rural water supply. Small communities request their own small systems, and designs are determined by funding possibilities and (largely preset) rate limits rather than cost-effectiveness or optimal coverage. Since scarcity of capital, especially if it involves foreign exchange, constitutes one of the crucial constraints in developing countries, this aspect is indeed critical to any consideration of transferability.

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16. EPA, *FY 1987 Compliance Report*, 1988, draft.

17. EPA, *National Statistical Assessment*, 1984.

18. *Ibid.*

19. *Ibid.*

Again, however, this does not invalidate the relevance of the United States' experience. The low unit cost<sup>20</sup> of the distribution system, when compared with that normally prevailing in developing countries, makes for a correspondingly lower stress on cost saving in the system or on alternative technologies.

A more significant factor, and the major problem facing rural water supply in developing countries, is not capital cost, as such, but sustainability. If massive public resources are not continually forthcoming to prop up management, operation, and maintenance, the investments quickly become inoperative.<sup>21</sup> From this point of view, the diseconomies inherent in the FmHA approach carry much less weight than the fact that even small systems in the United States continue to operate, and that the responsibility for ensuring this lies firmly with the consumers themselves.

Even in the United States, it can be argued that the initial reduced size (and the consequent diseconomy of scale) is a price that has to be paid in order to ensure that the systems are actually managed by the consumers.<sup>22</sup> As Table 2 showed, there seems to be a tendency for small systems to become regionalized, that is, to link up with each other to enhance the financial viability of the operation and reduce unit costs. This tendency is also expressly supported by the FmHA, and can perhaps be seen as a second step in consolidating the RWS situation.

#### *Public versus private*

As noted in one of the surveys used above, there seems to be a tendency for public systems to be less financially viable than private ones. Part of this is no doubt related to the fact that public bodies, being more enmeshed in the political process, have an built-in tendency to subsidize the cost of water from other fiscal accounts or sources of revenue.<sup>23</sup> It should also be noted that, despite the fact that most of the very small systems are privately owned, they are located in poor communities, they have a higher mean water rate, and apparently they fare better financially than do the public systems.<sup>24</sup>

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20. With narrow trenches and exclusive use of competitively priced PVC pipes, the average cost is \$2/foot of line. In a country like Tanzania, the corresponding cost would be from \$18 to \$21 (which includes a heavily subsidized foreign exchange component--PVC, or for that matter galvanized iron, pipes are not manufactured within the country).

21. For example, it has been calculated that during the period 1990-1995, the cost to the government of India just to operate and maintain existing RWS installations will run to IRS 34 billion (some \$3 billion). This is roughly half the estimated required capital investment for RWS. (G. Tamm, Å. Möller, and R. Srivastava, *India--Rural Water Supply and Sanitation*, SIDA, 1988.)

22. See Chapter 4 for a more detailed discussion of the management of small systems.

23. See, for example, the assessment and arguments raised by the National Council on Public Works Improvement, *Report on Water Supply*, pp. 11-12.

24. EPA, *1986 Survey*.



Although these differences between public and private systems appear marginal in the United States, they would probably be magnified if transferred to most developing countries where politics in local public bodies is pervasive. From this viewpoint, it appears that a single-purpose, nongovernment, nonpublic-owned entity would stand a better chance of performing than would a public system.<sup>25</sup>

*Technology, design, and level of service*

Dis-economy and management problems stemming from a suboptimal choice of technology are other troublesome aspects of RWS systems in the United States. In general, these are reflected by overcapacity in the small systems, by problems in complying with quality standards (behind which often lie problems in operating a given treatment plant supplied and installed by the contractor), and by low or negative operating margins.<sup>26</sup>

The National Council for Public Works Improvement has observed that, from the viewpoint of cost efficiency, the introduction of new technologies into the water supply sector has historically been slower than in many other sectors of the economy. It ascribed the "technological conservatism" to the vague relation between consulting engineer, contractor, and owner-operator--"the evil triangle." According to the Council, the process "does not establish a clear, single source of responsibility that can efficiently design, construct, and operate a plant. The net effect of the system is to drive the technology and equipment quality to the lowest common denominator and to drive the costs up, to the benefit of no one."<sup>27</sup> Such a view would seem to endorse a stand frequently used to rationalize the heavy government involvement in developing countries: that it is only the government that has the requisite capacity for ensuring that the RWS sector is both cost-effective and operational.

However, lest this issue become a question of conservatism in choice of technology, it should be remembered that water supply in the United States always refers to a fairly narrow technological option: piped systems with domestic connections. In developing countries, where the range of technology must be wider (from small improvements of traditional sources, to harvesting techniques, to dug wells, boreholes with handpumps, and piped systems), the need for "a clear, single source of responsibility" should be far less than in the United States.<sup>28</sup>

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25. The difficulties encountered with public or government ownership and management of RWS installations is one reason why Tanzania is now experimenting with village, neighborhood, or consumer ownership (for example, in the HESAWA program). Similar experiments are being launched in Kenya through the national Water Use Test Programme. Likewise, evaluations carried out in India in 1979-1980 by the Planning Evaluation Organization found that systems under the management of local government bodies were largely inoperative due to "political management."

26. *Ibid.*, particularly sections 4 and 5.

27. National Council on Public Works Improvement, *Report on Water Supply*, p. 74.

28. For an insightful discussion of the United States RWS sector from this perspective, see National Water Demonstration Project, *Drinking Water Supplies in Rural America*, 1978.

### **III. INSTITUTIONAL AND ORGANIZATIONAL FRAMEWORK**

Encompassing the United States rural water supply sector are a number of administrative, organizational, and legislative entities and relationships that warrant attention. However, because this study is not an assessment of the intrinsic dynamics or achievements of the United States RWS sector, only those aspects are considered that have a bearing on the situation in developing countries. Consequently, much has been omitted that, from a purely United States viewpoint, might be critical; the selections may also appear somewhat arbitrary.

For example, an organization such as the National Demonstration Water Project (NDWP) has been omitted from this review despite the fact that its aims and objectives are strikingly similar to those of many national sector programs in developing countries (especially those programs that evince a heavy donor influence). However, this similarity is also the very reason why the NDWP (along with its various offshoots) has been left out of the discussion. Omission was not because of lack of relevance but because that project was too similar, facing the same problems and having probably as much to learn from developing countries as it has insights to provide. More important, the NDWP is very much a program for the margins, for low-income groups and scattered populations where standard approaches and technology are not feasible.<sup>29</sup>

Again, although legislation is, and has been, important for the water sector as a whole, it has not been a driving force in the expansion and consolidation of rural water supply. On the contrary, until recently legislation has only confirmed, rather than directed or promoted, action; has been more passive than active; and has played a very limited role in the development of the RWS sector. With the 1986 Amendment to the Safe Drinking Water Act and, more important, with the active stand increasingly adopted by the EPA (again in response to public environmental concerns rather than as an expression of a clear-cut government policy), this is changing, and the regulatory and interventionist role of government is becoming more pronounced. However, enforcement of rigid quality standards is not likely to be the most pressing concern in developing countries. Consequently, the EPA (or its legislative backbone) will likewise be touched upon only insofar as it has direct bearing on the establishment, operation and management of small rural water supply systems.

#### **Public Funding of Rural Water Supply**

Government programs supporting construction of local water supply systems are numerous and, particularly at the state level, usually noncategorical. They are part of either a regional economic development effort (for example, the federal Appalachian Regional Commission, ARC) or support to low-income communities (for example, the Economic Development Administration, EDA, and the Department of Housing and Urban Development,

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29. Relying totally on public funds, the NDWP was started in 1972 as a nonprofit corporation. With its roots in antipoverty programs, it resembles many donor-supported NGOs in developing countries, stressing extension, activation and direct assistance to low-income groups.

HUD). Although in specific instances such programs may play a vital role in getting a particular system launched, in overall terms their role for RWS is marginal.

The only program, federal or state, that has a separate component for RWS is the FmHA. It is also the single most important source of financial assistance for small systems and the only one with a field organization that extends to the county level.

*Farmers Home Administration (FmHA)*

The Farmers Home Administration is the credit branch of the federal Department of Agriculture.<sup>30</sup> Its basic mandate is to support agricultural and rural development by providing financial and technical assistance to rural areas of the country.

The FmHA is set up to operate as a soft loan and concessional credit agency for rural development, supplementing private lending sources rather than competing with them. Its official charter directs it to "serve as a temporary source of supervised credit and technical support for rural Americans for improving their farming enterprises, housing conditions, community facilities, and other business endeavors until they are able to qualify for private sector resources."

Under the legislative authority of the Consolidated Farm and Rural Development Act (7 U.S.C. 1926), the FmHA has been operating under various names since 1935 when it began to provide loans and grants to farm families struck by the Great Depression. It gradually evolved into a source of credit for nonfarm families and rural communities in general, for example, in the fields of water and sewer services, community facilities, business and rurally based industries. During fiscal year 1986, the FmHA disbursed a total of \$7 billion in loans and grants under the following programs:

Farmer Program	\$4,358,000,000
Rural Housing	2,036,000,000
Business and Industry	54,000,000
Community program (including RWS)	552,000,000
<b>Total</b>	<b>\$7,000,000,000</b>

With respect to rural water supply, the Water Facilities Act of 1937 endorsed the provision of loans for individual and farm community water supply systems in 17 western states facing drought and water shortage. This act was amended in 1954 to apply nationwide and to extend government-subsidized or government-supported systems to nonfarm consumers in rural areas. The FmHA is authorized to provide credit or grants for installation, repair, improvement, or expansion of water and waste systems in municipalities with populations of up to 10,000. Its total present staff is about 11,000, and with more than 1,900 county offices, FmHA covers all rural areas in the United States. It is the only federal capital program that

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30. See Annex A for a brief history of the FmHA.

takes explicit account of community fiscal ability in determining the amount of federal assistance to be provided.

Normally loans are made at the market rate, that is, the same rate as that faced by municipalities issuing new bonds, but with the favorable term of 40 years. For low-income communities, loans at concessional interest rates ("poverty line rate" and "intermediate rate") may also be provided.<sup>31</sup> Finally, the FmHA can make grants with no matching requirement to reduce user charges to an acceptable level. This level, quoted by FmHA staff in the field as presently about \$12/1,000 gallons (\$3.17/1,000 liters), is based upon the ratio of debt service to median local income. Grants may be provided only up to 75 percent of the total capital cost of a particular system.

During the years 1977-1987, the FmHA provided a total of \$6 billion in loans for water and waste disposal systems via more than 14,000 loans (multiple loans were frequently made to the same system). During the same period, a total of \$2.4 billion, for 8,100 individual cases, was given as grants.<sup>32</sup>

Due to the present Administration's budgetary squeeze, there has been a steady decline in FmHA's funds for RWS since the 1970s peak. In line with budget cuts, the ratio of grants to loans has also decreased, from roughly 1:2 to 1:3 at present.

Demand for improved water and waste disposal systems continues to be very high, however. The present backlog of preapplications and applications is for \$800 million in loans and \$257 million in grants. The corresponding unobligated funds for this fiscal year are \$292 million and \$91 million, respectively.<sup>33</sup>

An interesting feature is the shift over time from water supply to waste disposal: 74 percent of total disbursements were for water in 1977, but this figure decreased to 58 percent in 1987. Whether this represents an intentional shift by FmHA or a shift in demand could not be determined.

Even though community water supply and waste disposal constitute an important component of the FmHA's total program, it is important to remember that this is but one of the many points of interaction between the rural communities and FmHA. Overall, RWS accounts for only 8 percent of FmHA's total appropriation, and it is decreasing in both absolute and relative terms.

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31. See FmHA instruction 1951-E, Revision 1, for details on conditions and servicing procedures of community loans and grants.

32. Information provided by FmHA federal headquarters, Washington, D.C. For an annual breakdown of loans and grants for the period 1977-1987, see Annex B.

33. As of November 7, 1988; figures provided by FmHA federal headquarters, Washington, D.C.

### *Economic Development Administration (EDA)<sup>34</sup>*

The EDA program (and its regionalized versions, for example, the Appalachian Regional Commission, ARC) disperses federal funds as individual project grants to states, counties and cities. Under both the EDA and ARC programs, grants can be made for up to 80 percent of total project costs. Eligibility is based upon median family income, unemployment rates, and the availability of other resources.

Since 1965, spending for water supply projects under EDA's program has fluctuated between \$35 million and \$45 million per year, while ARC funds have remained steady, around \$10 million per year.

In view of the "lead agency" role played by FmHA in the RWS sector, both EDA and HUD (see below) have joint co-financing formats and procedures developed by FmHA to ensure proper assessment of economic feasibility.

### *Department of Housing and Urban Development (HUD)*

Since 1974, HUD has supported two programs: entitlement block grants targeted toward low-income urban communities, and a discretionary program for small cities that is largely administered by the states. Block grants are distributed to cities with populations over 50,000 as entitlements based on population, the extent of poverty, and the amount of overcrowding. Over 700 local government units are eligible to apply for entitlement grants each year. Discretionary HUD funds are available to small cities (with fewer than 50,000 inhabitants) on a project-by-project basis.

Annual federal appropriations and the percentage of funds used for water supply vary, but over the past few years approximately \$40-50 million in entitlements and \$100-200 million a year in discretionary grants have been spent for water supply. The total 1986 HUD outlay for water programs was approximately \$187 million.

### **Technical Assistance**

No organized government program for technical assistance or extension exists for the RWS sector. Although federal and state authorities such as the FmHA, the EPA, and state health departments all provide a certain amount of technical assistance, they do so only when specifically requested (and then help is sparing, due largely to manpower shortages). The EPA and state health departments organize training courses for water system operators. However, these courses are more a function of their regulatory role (that is, ensuring that all systems are run by certified personnel) than an ongoing resource for technical assistance.

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34. The following sections on EDA and HUD are taken primarily from the National Council on Public Works Improvement, *Report on Water Supply*, 1987.

The only more extensive technical assistance available to rural systems is that provided by the National Rural Water Association or, more correctly, by its constituent state associations.<sup>35</sup>

*The National Rural Water Association (NRWA)*

As noted above, water loans were made in record numbers during the 1960s to community-based and community-owned water systems in rural areas. Day-to-day operations were left to the consumers/members themselves, and many systems were too small to afford the services of professional technical and managerial staff. In the late 1960s, systems operators and boards of directors in some states began to establish links for informal training sessions and for the exchange of technical and managerial information. This led to the creation of statewide rural water organizations (RWAs), with individual systems as members.

Among the earliest of these was the Oklahoma Rural Water Association (1970) which played a leading role in developing a unique technical assistance process, the so-called circuit rider system. Combining funds obtained from the Oklahoma state government with membership fees from individual systems throughout the state, the Oklahoma RWA started a training-visit service for all RWS systems, whether or not they were members.

The key figure in this process, the "circuit rider," is a professional, experienced system operator employed by the state RWA. The circuit rider's functional characteristics are listed below.

- ▶ Has a defined area of responsibility (circuit);
- ▶ Is personally known to all system managers;
- ▶ Deals with all types of practical, operational problems;
- ▶ Has no association or link with any manufacturer;
- ▶ Has no regulatory responsibility;
- ▶ Is perceived as an ally and peer by system managers and operators;
- ▶ Has a relevant practical background: at least 5 years of operating experience with a rural utility system (there is no emphasis on theoretical or academic qualifications);
- ▶ Provides referral for special assistance;
- ▶ Carries out on-site training;

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35. Again, mention may be made of the target group-oriented National Demonstration Water Project, which combines technical assistance with extension and promotion. A compilation of the area-specific or problem-specific referral bodies that are, in principle, available to rural systems is found in: National Regulatory Research Institute, *Commission Regulation of Small Water Utilities--Outside Resources and Their Effective Use*, 1984.

- ▶ Works for the state association;
- ▶ Visits or is available for any system within his circuit, whether or not a system is a member of the RWA;
- ▶ Does not volunteer to make any repairs, etc., but gives advice and training; and
- ▶ Comes from the circuit's area, is familiar with traditions, languages and dialects, geography, etc.

Retaining this rural peer-group approach, which also implies locating its national headquarters in a rural area (Duncan, Oklahoma), The National Rural Water Association has retained its rural peer-group approach. Its headquarters has been located in a rural area, and it has grown into a national network which represents and supports rural water supply systems. At present, it employs about 140 persons, both directly and through its state affiliates, and each state association has its own office as the focal point for small system assistance and representation.

Each state affiliate employs, at a minimum, a program manager, a circuit rider, and a secretary-bookkeeper. The program manager conducts training programs, provides part-time technical assistance, and serves as the general manager for state activities. The circuit rider provides on-site assistance to a minimum of 35 water and wastewater systems each month. This assistance is rendered for all types of operation, maintenance, and management problems.

With the circuit rider program as its core and with its national headquarters as a low-key facilitator and backstopper, the NRWA provides:<sup>36</sup>

- ▶ Hands-on technical assistance to rural systems throughout the country;
- ▶ Institutional and on-site training with emphasis on practical issues;
- ▶ An information and publicity network for problems, regulations, and guidelines relevant to rural systems; and
- ▶ A supportive, advocacy organization for RWS systems.

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36. For more information on the NRWA and its activities, see Annex C.

#### IV. SMALL RURAL WATER SUPPLY: MODELS AND REALITIES

While available data can indicate the RWS sector's structural features and broad patterns of performance, they reveal little about community management, either its forms or modalities. However, statistics do reveal that, despite the obvious difficulties faced by operators, managers and boards, these systems survive and function.

According to assessments made by FmHA field staff, less than one percent of the systems are, at any time, experiencing managerial and/or financial difficulties sufficient to warrant FmHA intervention. Although the FmHA acts only (or primarily) on debt-servicing defaults, it is noteworthy that even small systems in poor areas usually manage to function. Similarly, even if noncompliance with water quality standards (or with sampling requirements) is frequent among small systems, this is probably indicative of the marginality of the small systems vis-a-vis urban-based standards, rather than of deep-seated operational problems or health hazards.<sup>37</sup>

The fact that small systems survive and operate despite the problems discussed in Chapter 2 is in itself an indication of the strength of the community management approach. In this section, an attempt is made to consider the *hows* and *whys* of this strength against the backdrop of the framework set up by the FmHA to respond to and support local initiatives.

##### The FmHA Model

The steps for establishing a community-managed water supply system with FmHA support are as follows:<sup>38</sup>

##### Step 1: Forming a nonprofit corporation or water association

*Actor:* Residents of any rural community with a population of less than 10,000.

*Activity:* Mobilizing and enlisting members, that is, persons living in the area, municipality, or community who pay a membership fee and sign a water-user's agreement indicating their interest in becoming consumers of a new system.<sup>39</sup> Electing a board of directors, establishing bylaws, and securing a notification of incorporation for the association from the state authorities.

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37. This is (or was) also EPA's view. See: EPA, *National Statistical Assessment*, p. 10.

38. FmHA Instruction 1942-A, *Community Facility Guides*, gives detailed formats and guides for some of these steps.

39. See Annex D for a model format of a water users agreement.



*Assistance or approval:* FmHA distributes guidelines and brochures on bylaws, etc., on request. Attorney to provide legal services in connection with incorporation, etc. State Public Service Commission to grant easement.

## **Step 2: Designs, plans, specification, and tendering**

*Actor:* Private consulting engineer at request of the corporation or association.

*Activity:* Design and specifications drawn up in compliance with parameters laid down by FmHA, EPA, and state health department. Fees of engineer and attorney deferred in anticipation of design's being approved for funding by FmHA. Construction by contractor through open competitive bidding.

*Assistance and approval:* State health department for water quality and capacity of proposed system, FmHA for economic feasibility ("reasonable rates"). FmHA guarantees interim loans from commercial bank, with FmHA closing the loan at project completion. Supplementary grants, if any, are then paid out as work progresses. Funding approval is based on established population, health, and income criteria, with substantial discretionary powers accorded to FmHA field units.<sup>40</sup> Consulting Engineer assists in supervising construction.

## **Step 3: Operations**

*Actor:* Board of directors is responsible for compliance with government regulations covering water supply. System operator must be trained and certified in accordance with health department standards.

*Activities:* Water samples are submitted monthly to health department; noncompliance may result in withdrawal of operator's certification and legal proceedings against board. Revenue collection and debt servicing must be in accordance with conditions laid down by FmHA and funding agencies, and as stipulated in the bylaws. Monthly financial and performance reports must be submitted by manager-operator to FmHA. Financial audits undertaken by independent certified public accountant must be submitted annually. O & M per requirements.

*Assistance and approval:* EPA and state health department for water quality; FmHA for debt servicing (FmHA also expected to monitor financial management); consulting engineers, suppliers, and contractors for outside O & M support; circuit rider of state RWA for general technical assistance and advice; NRWA for protective and promotive lobbying at federal level.

There are detailed rules and requirements beyond those listed above. The number of formats and detailed guidelines that have been developed is formidable, and they require

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40. See FmHA Instruction 1941-A (Guide 26).

literacy and familiarity with formal administrative, technical, and legal concepts for understanding.

### Systems in Practice: Field Observations

The two areas in which field studies were carried out, southern Texas and the Mississippi Delta, differ substantially. In **southern Texas** the systems were generally large, most with 800-1,200 connections and extensive distribution networks. The area has a marked demographic instability because it contains a large transient population. In general, the rural economy is poor and household incomes are low.

For historical, cultural and geopolitical reasons (the area is a border zone), southern Texas is a politically sensitive area. Substantial public funds have been earmarked for social and development programs in this region. Most of the RWS systems have received grants, in some instances over the maximum 75 percent set by the FmHA. This is usually the case when the Rio Grande is the water source and the treatment required drives up the cost to a level otherwise beyond the "reasonable rate." Due to the size of the systems (and, where river water is used, the necessity of a treatment plant), practically all systems have a cadre of full-time professional staff. Moreover, their boards of directors are frequently drawn into, or used as platforms for, political influence.

The systems visited in the **Mississippi Delta** were generally much smaller, 50-300 connections. Demographically the area is much more stable, even static in many localities, and there is little migration. Household incomes are generally lower than in southern Texas, but probably more stable. A significant portion of the population is entitled to social security assistance (for instance, food stamps). Although southern Texas is as homogenous in social and ethnic terms--the Hispanic population is as dominant there as is the black population in rural Mississippi--the Mississippi localities had more community bonds and common focal points such as schools, churches, etc. In this way Mississippi, more than southern Texas, resembles the communities frequently encountered in developing countries.

Common to both areas was the contrast between well-developed infrastructure and extensive pockets of poverty. Another similarity was a distrust of outsiders, government officials in particular (with the partial but significant exception of FmHA staff), a familiar theme in developing countries as well. Nevertheless, it was also apparent that the peer spirit characterizing the relation between the field staff of the RWAs and the system operators in both states was remarkably effective.

The following observations are based on visits to ten small systems.<sup>41</sup> Because the availability of knowledgeable informants and the quality of records varied greatly, the observations are presented in the form of an artificial composite case study created from

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41. In Mississippi eight systems were visited, two systems were visited in southern Texas. The systems were selected primarily in terms of being "good," with an efficient management, or "bad," with a record of defaulting debt service. It goes without saying that the basic purpose of these cases studies was to illustrate the process of community management, not to analyze a representative sample of systems.

information gathered from all the systems visited. Wherever there was a marked variation between the systems, it is so noted.

*"Ruralville Water Association"*

The system was commissioned in 1969 and serves 250 persons through 75 metered connections. Funds were obtained through the FmHA (50% of the total cost as a 40-year loan at 5% interest, and 15% as a grant); HUD (a grant covering 20% of the total cost); and EDA (15% as a grant). The initial rate endorsed by the FmHA was a flat rate of \$3 per 1,000 gallons, with a minimum monthly charge of \$6. Membership fee in the association is \$5, and each member pays the actual cost of connection (from the distribution main or meter point to the house). The 75 connections represented 55 percent of all resident households within the area covered by the distribution pipes. Households declining membership continued to rely on their own private wells or collected water from a nearby small industry, which had its own system.

By 1984, the system had grown to 150 connections due to the construction of new houses and the signing on of most of the original nonjoining households. Funding for this expansion, which took place in 1978, was arranged through the FmHA (25% as a loan at 5% for 40 years, 65% as a grant) plus savings generated out of the association's own revenues (10%). In 1985 the system was again upgraded with a new well, a new chlorination plant and higher-capacity pipes. The number of connections had increased to 160. The FmHA assisted by arranging a new loan on the same terms as the earlier one, along with a grant of 30 percent of the total cost, 15 percent put up by the association from savings generated.

In 1987, the federal government sold the loans of this system (along with 4,000 FmHA loans of other systems) on the open capital market. Debt servicing is now managed by a private company with headquarters in Houston, Texas, instead of the FmHA District office.<sup>42</sup>

The present rate is a flat \$8 per 1,000 gallons (minimum \$16 per month) with an average monthly bill of \$25 per household. The membership fee for new members is \$200. The fee, which implies an equity share in the system, is reimbursed if membership is revoked for legitimate reasons (for instance, relocation) but cannot be transferred or sold.

The association has been in serious financial and managerial situations twice, the first time due to slack billing practices, the second time due to a reluctance to raise the rate. On both occasions FmHA intervened, once invoking the threat of receivership (see Section C below).

The system has a Board of Directors with five members, only one of whom (the initiator and driving force behind the system) has been continually associated with the system throughout its existence. The association is not a member of the state rural water association but has requested and received the assistance of its circuit rider twice. It has one certified

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42. This policy of capitalizing federal funds tied up in FmHA RWS loans was first implemented in 1987 and will continue until 1989. Only those systems with a viable financial record are included in this type of sale. In purely financial terms, it does not affect the systems involved.

part-time operator and a part-time secretary. Meter reading is done by the operator's wife on a commission basis. The association has a small office adjoining the chlorination plant.<sup>43</sup>

*Development phase:*<sup>44</sup>

The system was initiated by a married couple. The husband learned of the possibility of getting FmHA assistance in arranging funds for water supply from the county FmHA officer who had previously helped him with a business loan.<sup>45</sup>

The couple's motivation appears to have been as much from convenience (the private well was in the courtyard) as from ambition to be "modern" and get "city water."<sup>46</sup>

The women acted as a pressure group on the men, organizing door-to-door canvassing for membership in the association to be formed. A consulting engineer from a nearby town assisted in mobilizing members and participated in the general meeting when the association was formed.<sup>47</sup> An attorney assisted in the incorporation of the association. Both worked on a deferred-payment basis, trusting that the required grants and loans would be approved by FmHA.

Initially many households were reluctant to join as founding members of the association. The core of initiators, therefore, signed up several individuals in their household as members. This was done to reach the minimum number of connections which the engineer had deemed necessary for a viable system with "reasonable" rates, according to FmHA statutes. Fewer still volunteered to be elected to the board of directors.

Apart from the general layout of the distribution mains, the board had little to say about design. It was left to the consulting engineer to do whatever was required to secure

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43. This system has more of the Mississippi system characteristics than those of southern Texas. However, it conforms broadly (with some exceptions) with the overall pattern.

44. The "development phase" of the system means all activities up to the actual commissioning.

45. The variations here were not as many as one would think. Of the six systems where information on initiation could be collected, four began in this way (two of these learned about FmHA assistance through acquaintances who were members of other associations). Of the rest, one got started through the intervention of a religious charity which acted on behalf of the community, and one was politically launched.

46. At no system was the health benefit given as a reason.

47. It was apparent, both from interviews with consulting engineers and from informants at some of the systems, that engineers frequently take a very active part at this stage; some even act as "initiators" proposing the system to selected leaders in the community. Being familiar with the procedures and criteria laid down by the FmHA and with the state health department, they naturally stand to gain from actively developing the market. However, the promotional role of the engineers should not be overrated. Their most important contribution in this respect is probably one of pushing the FmHA model to the margins of its applicability.

design approval from the health department and FmHA. However, some of the board members made frequent visits to the FmHA district office in order to "push the files"; in addition, the FmHA loan officer visited the locality once with the engineer. After ten months, the FmHA approved a finance plan, and bids for constructing the system were requested. Six months later the system was commissioned. Most of the application processing was done by the engineer, and the legal paperwork by the attorney. Their fees were contingent upon system approval and were 10 percent and 1.5 percent, respectively, of total construction cost.

*Operational phase:*

In spite of bylaws and operational guidelines adopted by the board (patterned on formats provided by the FmHA), management was highly personalized from the start, and remains that way. Accounts are kept on loose sheets of paper and filed irregularly.

The yearly audits required by the FmHA<sup>48</sup> from an independent public accountant have continually noted the need for tighter management. However, little action has been taken either by the board or the FmHA (except in two instances when the association materially defaulted on the debt servicing).

Delinquent accounts make up about 10 percent of the total. Normally the meters are cut off after a member has defaulted for one month (with some leeway given for special situations). Enforcement in billing matters depends on the operator's authority and the extent of recognition accorded him or her for keeping the system going.

The initiator of this system acted as the manager-operator from the beginning. His resignation in 1979 caused a management crisis, and the association was unable to meet its obligations toward the FmHA (see below). At the prodding of the FmHA, he resumed his duties as manager-operator for four more years. During that time a new operator was found and was provided operator certification training by the state RWA.

Routine physical inspections of the two wells and pumping stations, the tank, and the chlorination plant are carried out weekly by the operator. Casual inspections for leaks along the distribution mains are done ad hoc. Water samples are sent monthly to the state health department for chemical and bacteriological testing.

*Community management and user involvement:*

The first test of strength for the association management came with the initial operator's resignation. The new operator was not willing to enforce discipline in billing and collection, and board members could not agree on a firm policy. Enforcement of billing deteriorated rapidly, accurate accounts were not kept, and it became increasingly difficult to distinguish delinquent from paid-up customers. Accumulated reserves were used to defray service charges, and the association started to default on debt servicing to the FmHA.

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48. Quarterly financial statements are also required by the FmHA, but smaller systems submit these very irregularly. Even when they are so submitted, they are frequently only filed and no action is taken.

After repeated letters from the FmHA District Office containing increasingly implicit threats of receivership, FmHA officials attended a board meeting where they openly and strongly advocated that Mr. X (the initiator) resume management and operation. The message was that, if this were done and solvency restored, the FmHA might consider restructuring the association's debt. The FmHA loan officer would be available for consultation whenever required. The proposal was accepted by both the board and Mr. X. After two years, the finances were restored to a shaky but current level and a reamortization effected.

The second test came a few years later when it was obvious that, in spite of strict enforcement of rate collection, the revenues were not sufficient to carry operating expenses, or provide for savings or reserves. This time the chairman of the board was a politically ambitious new resident who strenuously opposed any rate increase. The management went haywire, billing fell behind, and the operator resigned. This time, however, a small group of members took it upon themselves to put the management in order. After a series of heated public meetings and considerable voluntary efforts to mobilize the membership as a whole, a new board was constituted, rates increased and finances gradually restored to uncertain but current levels. Throughout this period the FmHA remained passive, waiting for the outcome. Debt servicing was done via savings.<sup>49</sup>

Throughout this period, the level of involvement of the community, that is, the members in the association, was minimal except for the payment of meter bills and the initial fee. Even the association's annual meetings—at which the board of directors are elected, policy issues such as rates decided and possible plans for upgrading approved—are normally poorly attended. On average, from 15 to 20 out of 160 members attend, and it is frequently difficult to find candidates to fill vacancies on the board.

Future problems that will occupy the attention of the Board include:

- ▶ How can they reach, talk to, or explain their financial situation to the company in Houston that is now responsible for collecting the interest and amortization payments of their loans. Who are they? What do they know about small rural systems? Will they advise, like the FmHA, on how to clear up the financial troubles everyone knows are bound to recur?<sup>50</sup>

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49. Accounts from one system reflecting the above problem were collected in some detail. It should be stressed that events such as those narrated above are ubiquitous. Their impact differs for obvious reasons, with larger systems having more professional management and greater financial staying power.

50. This was indeed a dominant theme in many discussions with system managers and board members. In recognition of this fact, the FmHA and the General Electric Credit Company (the one now managing the loans on behalf of investors) have provided financial support to the NRWA to operate a "financial management" circuit rider program to facilitate the interaction between the GECC and the systems.

- ▶ What will the stiffer water quality standards of the EPA (introduced by the 1986 Amendment of the Safe Drinking Water Act) imply in terms of cost, treatment, sampling, and so forth?<sup>51</sup>

### **Characteristics of Small Community-Managed Water Systems (FmHA Model)**

Summing up the small rural water supply systems as they appeared from the (admittedly) limited case studies, one sees the following characteristics:

- ▶ Initiative most often comes from individuals in the locality, never from the government or funding agency.
- ▶ The system is based on an incorporated nonprofit association with formal bylaws, an elected board of directors, and independently audited accounts.
- ▶ The cost for procuring and constructing the system is borne by the association, with the FmHA making available a mix of loans and grants (or combining with other funding agencies and/or banks to arrive at a funding package).
- ▶ Staff is small and often works only part-time.
- ▶ Billing and enforcement policies are variable and are as much related to the credibility and respect accorded to the day-to-day management as to the rules and regulations of the association.
- ▶ Rates are set, in principle, by the association, but with FmHA endorsement.
- ▶ The system has a high degree of autonomy, with outside or government supervision only in the area of debt servicing.
- ▶ There is no taxing authority; the only revenue comes from the sale of water.
- ▶ The choice of whether or not to join the system is made by the individual; full coverage is not a required policy, and is only assessed for economic feasibility or "reasonable rate."
- ▶ There is good access to outside commercial services (spare parts, engineering and legal expertise).
- ▶ Metered connections and rate policy (flat or progressive) are determined by the association.
- ▶ Management is often personalized, regardless of the bylaws. This can produce extreme variations over systems as well as over time within a system.

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51. This issue came up even more frequently. The NRWA is also very much involved in it, translating the concerns of the systems into relevant proposals for the EPA and vice versa.

- ▶ Accounts and financial management are personalized and frequently ad hoc.
- ▶ "Community" is defined by common membership in and use of the public utility, with no social or administrative bonds implied.
- ▶ Community management means **user management**. It is based on individuals who are customers, or equity holders, of the system, not "merely" on being a member of a community or resident of a locality.

Looking at the systems in the United States from a developing country perspective, there is one vital feature that is striking by its very absence—O & M. From the regulatory framework guiding FmHA support in system development, maintenance does not figure prominently, if at all, as an issue. O & M are occasionally serious problems, but are nevertheless basically practical in nature and can be easily solved. They are not systemic features that need wide-ranging structural and organizational interventions. Spare parts are readily available, electricity is dependable and cheap, technical expertise can be bought over the counter, and most materials are inexpensive.

This description of maintenance is not intended to play down the importance of O & M as a problem in the United States. In fact, the magnitude of these problems has led to one of the most interesting and replicable features of the United States' experience—the circuit rider system of the National Rural Water Association (NRWA). Despite the existence of this outreach program, an ability to maintain and operate a system is not something that weighs into design, choice of technology, or indeed economic assessment in United States rural water supply.

Another noteworthy feature is that community residents have a choice of whether or not to join a system and whether or not to remain members. This choice appears to be central to the FmHA model. It makes possible the government's policy of responding to a demand (rather than satisfying a need) for improved community water supply.

This is not a matter of legal or organizational niceties, but of consumers able to rely on an existing supply or choose a better one. In the United States, a household can evaluate the added convenience of having "city water" against the cost of paying a membership fee, connection and plumbing costs, and monthly charges. The alternative is to remain with the courtyard; the well may be problematic, but not necessarily a constant source of disease infection. In many developing countries such a choice is simply not there: to compare a congested, low-yield, contaminated source located an hour's walk from the house with a courtyard well having reasonably safe and adequate water is not likely to be enlightening.

Both of these issues—the noncritical nature of O & M, and the possibility of choice—can be looked upon as conditional elements of the FmHA model and therefore of its relevance for developing countries.





## **V. THE EXPERIENCE OF THE UNITED STATES: ISSUES AND INSIGHTS**

To study the experience of one society in terms of its potential relevance for another implies a dual and fundamentally reflective analysis: trying to separate the contextually determined from the more generally valid features, then superimposing the latter on another social, cultural and economic environment. As the dismal experience with development in the 1950s showed, this undertaking is neither easy nor risk-free.

What is there to learn from the United States' experience? How can such a translation process take place? If, as was maintained earlier, the United States RWS experience is basically a reflection of changes taking place in the society itself rather than the outcome of a conscious intervention on the part of the government, how can any of that experience be transferred, translated or replicated elsewhere?

In the broad scheme of the relatively well-defined FmHA model, there are many issues that may pertain to rural water supply in developing countries. One of the most salient features for an outside observer is indeed the essential similarities of issues that are being, or have to be, faced, whether in depressed areas of the United States or in Nigeria, Tanzania, Yemen, or India.

Of relevance here are not the similarities so much as the differences—some issues that are prominent, or even decisive, in shaping the RWS landscape in the United States do not figure at all, or do so only marginally, in developing countries. The most obvious among these is the role of private interests. Although this is hardly surprising, it nevertheless appears decisive for the development of the sector.

Another difference, which touches upon one of the most cherished notions among philosophers of rural water supply in developing countries, is that of promotion and mobilization, that is, the software package that has become an integral "must" in current RWS efforts in developing countries. Even in the poor and semiliterate areas of the United States, there is no organized "marketing" either of the economic or health benefits of improved water supply. Furthermore, there are no parallel and supportive efforts to mobilize and organize the community. But the absence of this does not seem to impede willingness to pay or the ability of the community to shoulder the financial, managerial and operational responsibilities of the systems.

Finally, the external support that is provided also differs from the standard pattern in developing countries, in content as much as in form. There is no single purpose or sector-specific government agency in charge of RWS, but a multipurpose rural development agency that enables rather than implements, supports rather than executes. Likewise, technical assistance is based on, and provided by, the accumulated experience of the systems themselves rather than by an external body or branch of the government.

As a model for replication elsewhere, the above summary of the United States' approach may be alluring. However, as mentioned above, the United States' experiences are closely intertwined with the very fabric of its society: its ideology, resources, polity and economy. The first step in applying these features, therefore, is not to list points of direct

replicability, but to "recontextualize" these components in a developing country setting. What is necessary is a translation rather than an outright transfer.

Accordingly, this chapter will discuss the above components and features of the United States' approach for the insight they may provide in RWS efforts in developing countries. The last chapter will then attempt to outline what such a translation implies in terms of policies, operational strategy, and trials.

### **Private Sector Involvement: "Water Means Business"**

The FmHA model is based on the premise that water supply systems are not constructed for "beneficiaries" (a common concept in developing country parlance) but by "customers" and "shareholders" (equally common in United States terminology surrounding public utilities). In other words, **drinking water supply is a business based on public demand**, however much subsidized by government and however much surrounded by a regulatory framework.

On the face of it, such a model implies a thoroughly commercialized approach to RWS, one where private interests and market forces (even if manipulated by grants, concessional interest and "reasonable rates") cause an efficient allocation of resources. But what if there are no resources to allocate, no market forces beyond the weekly fairs or black-marketeering, no interests independent of primordial loyalties, and a demand that is as insatiable as it is unarticulated?<sup>52</sup>

However, the FmHA itself recognizes that the market economy had to be supplemented by government interventions if small rural systems are to exist at all. Yet the distinguishing feature of this government intervention has been to manipulate the cost and supply of capital while assuming a passive stand on demand for the utility per se.<sup>53</sup>

Stripped of its all-too-obvious United States connotations, this basic concept can be translated into more general terms. The three cornerstones on which the FmHA model rests are:

1. *Funding is separated from marketing.* This implies that the funding agency does not engage in any promotion of the utility. It is a question of applicants having to

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52. This is a criticism that has also been made in the United States, albeit in considerably less drastic terms (see, for example, NDWP, *A Sense of Urgency*, 1977). At the other end of the spectrum, it may be noted that the National Council for Public Works Improvement complains that water has not been treated as a commodity but as a service delivery. This has led to inefficient resource allocations and severe diseconomies (NCPWI, *Report on Water Supply*, 1987).

53. It may be that some other agency or public health authority may have conveyed the message of the importance of safe water and personal hygiene for health, or that indeed schooling has brought about such an awareness. However, the point is not awareness of benefits but, rather, what triggers effective demand for a water system.

qualify for (and comply with the conditions of) funding, rather than beneficiaries having a rightful claim on resources. Marketing, insofar as it should take place at all, can be taken on by independent "brokers" or "facilitators" provided these are given a stake in the implementation and/or operation of the system (such as consulting engineers in the United States).

2. *Nongovernment actors, rather than the government or a funding agency, assist system development.* This implies that whatever service or know-how is required for the implementation of the system is procured or used by the community on the basis of credibility and performance, not on the basis of authority or status. This is essentially the principle behind free market forces. Translated into a developing country context, the same principle is associated with "nongovernment actors" rather than "private interests."
3. *The community procures the system.* Whatever the sources of funds or the extent of subsidy, neither the funding agency nor the government implements the system on the community's behalf. This implies that a part, however small, of the capital cost of the system has to be supplied by the community, whether from its own cash resources or through loans. Grants are then supplemental to the community inputs, whatever the proportion of the latter, rather than community inputs being supplemental to external support.

A critical aspect omitted (or at least not systematically promoted) from the FmHA model is that of **social outreach and coverage**. True, the FmHA credit and grant stipulations include income level as one important consideration in determining the applicable interest rates as well as the amount of capital grant in financing a system. But as described above (under "Statistical Overview" and "Technical Assistance, Chapters 2 and 3, respectively), these stipulations and their underlying approach can still leave adequate and safe drinking water beyond the reach of some persons (or for that matter poor and/or scattered settlements).

While the problem of bypassing some of the poor, which is inherent in the FmHA approach, may appear critical when viewed against the situation of most developing countries, it should not invalidate the relevance of the United States' experience. The FmHA model allows for, and is indeed based on, a manipulation of the rate structure as well as the capital cost recovery that falls on the community of users. The important point here is adherence to the principle that some part of the capital cost must be recovered, quite apart from O & M costs. It is through debt servicing that the external control of and support to, as well as internal performance pressure on, installed utilities can be maintained.

As illustrated by the field studies, the relationship of systems to the FmHA is frequently of primary importance in instigating necessary management changes of poor systems in crisis. It is also this principle that most clearly distinguishes the demand-oriented approach in the United States from the supply-oriented approach in most developing countries. Moreover, it promotes local commitment to and responsibility for the RWS installations.

Nevertheless, the FmHA model also assumes some sort of pre-existing water source adequate to provide a choice of whether or not to invest in an upgraded or improved system. As argued in Chapter 4, it is this individual choice that in the last analysis makes possible community ownership and management, since the FmHA responds to expressed

demand rather than need. This approach ensures that in periods of crisis the responsibility rests clearly on the community to do what is required to put the system or its management in order.

### **Promotion, Extension, and Community Mobilization**

One remarkable aspect of the FmHA model is the complete absence of promotion, extension, organization, and water-related health education on the part of the government. Indeed, the model shows that it is possible to promote sustainable rural water supply, managed and operated by the community, with minimal promotional and/or directive interventions by the government.

This is not, of course, a new idea. The situation in a growing number of developing countries is one of governments unable to shoulder the financial, managerial, or logistical burden of widely scattered, small water-supply systems. The result has been precisely the conclusion above. Most sector plans and policy statements today stress the concept of community management, (differential) cost recovery, and maintainability (as decisive for choice of technology). Such policies are often accompanied by contradictory statements—that the provision of safe water is a government obligation; that water is a basic right rather than a commodity; and that the level of service rather than maintainability determines choice of technology. That need not delay us here: what is of most interest is that such a policy has been successfully carried out.

Again, shedding its specific United States connotations, what should this actual experience imply? A common ambition of programs aiming at community participation is to ensure or promote the active involvement of a majority of community members in system design, planning and execution. What the FmHA model demonstrates is that individuals must involve themselves—they cannot be mobilized into a system. Despite comparatively high investments on the part of all members, the systems are created and run with the overt involvement of only a very few. When service declines or management breaks down, however, the personal investment and co-ownership of the system provides the basis for mobilizing individual efforts and capacities.

Health education may be the best way to ensure that improved water supply also leads to health benefits. After all, the bulk of water-related diseases are associated with unsanitary human behavior (waste collection, storage, and hygiene) rather than with quality of water sources. But this does not necessarily mean that health education is the best way to articulate the demand for improved water supply, a point illustrated by the United States' experience.

## **The Rural Delivery System**

Critical to the general effectiveness of the FmHA model is the broad and longstanding exposure that the FmHA has had to rural problems. This in itself contributes not only to the credibility of the organization in the eyes of the rural population, but also to the placing of priority on improved water supply within the overall agenda of needs in rural areas. It also fosters stability and credibility between rural households and the supporting agency.

This situation greatly contrasts with conditions prevailing in most developing countries where RWS has been (often at the prodding of donors) the exclusive concern of rigid technical organizations. The technically narrow "development from above" approach that such government departments brought in their wake has led to inappropriate technology options and extremely high per capita costs. More serious is the fact that O & M has been a major casualty.

However, it should be remembered that attempts in the late 1960s to put RWS within the framework of so-called integrated rural development programs were not notably successful.<sup>54</sup> The crucial difference between these largely discredited attempts and the FmHA approach is that the latter is consistently demand-based, making credit available. The former were supply-based, actively disbursing funds for imputed needs. Equally important is the fact that the FmHA does not get involved in actual implementation. It is up to the applicant communities themselves to procure the requisite outside services and materials.

### **Technical Assistance: The Peer Group Approach**

Perhaps the most readily applicable lesson is one that is not part of the FmHA model at all: the activities and experiences of the National Rural Water Association (NRWA). In many ways this is an offshoot of the strength as well as weakness of the FmHA approach. The consistency of this model implies that the public body responsible for supporting the expansion and improvement of RWS does not provide technical assistance to the systems. It is for the community or association to arrange for this themselves as part of their ownership and management responsibilities.

At the same time, it is clear that many small systems need constant access to practical advice and support on operational problems, for example, how to comply with rules and regulations, what are billing and accounting practices, and what simple design and capacity improvements can be made. With quality standards becoming increasingly important, the need is clear for feedback on the problems and experiences of small rural systems to be channelled to legislative and regulatory bodies.

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54. For example, the Rural Integrated Development Program (RIDEP) supported by the World Bank in Tanzania left behind little tangible benefits at very high cost, not the least with respect to RWS.

The outstanding feature of the NRWA is that these services—practical advice, technical training, and protective and promotive advocacy of the conditions of small rural systems—are made available through a cadre of experienced ex-system operators rather than through institutionally trained outside experts or commercial consultants. The obvious need for, and usefulness of, the NRWA peer-group support structure in a resourceful and developed market economy as the United States underscores its relevance for developing countries.

First, the well-documented mistrust that most communities in developing countries have toward outsiders and experts makes such a peer-group organization even more relevant than in the United States.

Second, the lack of experience and familiarity with technical equipment and machinery in developing countries puts a correspondingly higher demand on the availability of flexible, practical, and credible advice and support. The lack of this support has made even relatively participatory systems extremely dependent on continued government assistance.

Third, even more than in the United States (where the political process ensures a certain level of feedback), the fiscal, legislative and regulatory implications of rural water supply are seldom, if ever, considered by central government authorities.

There is consequently little doubt that the NRWA concept—and much of its actual practice—is of direct operational relevance for developing countries. In fact, as this concept provides a buffer and catalyst between individual small systems and commercial as well as public and government agencies, its relevance is not dependent on the particular policy adopted in any one country (that is, RWS as a government responsibility or a commercial utility).

## **VI. CONCLUSIONS AND RECOMMENDATIONS**

It should be recalled that the study is part of a larger research program launched by the World Bank. While each individual study in the overall program may be of direct and immediate relevance for strengthening and improving rural water supply in developing countries, it is the potential insights into forming an operational utility for rural water supply that has motivated this particular study.

Possibly the most important insight gained from this study is that the problems confronting one of the world's most developed countries in rural water supply are inherently the same as those of most developing countries, regardless of context-specific factors as technology choice, service level, or definitions of safe water.

This statement does not intend to discount the dramatic and, in terms of human suffering, immeasurable difference between rural water supply situations in developed and developing countries. It does, however, highlight the potential for sharing experiences, regardless of cultural, economic and political disparities. While the lessons to be learned from the United States may be relevant for developing countries, they will be so only if viewed as suggestions rather than design parameters.

There appear to be three broad areas where the FmHA model is relevant in planning efforts to support the rural water sector in developing countries. At the level of **policy**, the case for the government's facilitating, rather than directly implementing, improvements in RWS has a direct bearing on the crossroads at which most developing countries now find themselves. In terms of **operational strategy**, the very success of the FmHA model underscores a basic prerequisite—systems are not initiated to satisfy a basic survival need, but in response to local assessments of marginal utility. Finally, in terms of **community management**, it is the factors that underlie this management, rather than the properties of any particular model, that give it substance.

### **Policy: Facilitating versus Implementing**

In many ways, the relative roles of the government, community and the consumers in the United States are the reverse of those prevailing in most developing countries. In the latter, the community's role has been that of facilitating implementation of a government program (frequently donor-sponsored), whatever the semantics of the policy might be. That the community is encouraged to "participate" and "get involved" in the planning and implementation does not alter this basic feature. Indeed, the terminology used further underlines that initiation, responsibility and authority are firmly vested with the government. Therefore, it is hardly surprising that real community participation seldom goes beyond the digging of trenches.



More general and long-term policy guidelines distilled from the United States experience can be summed up as follows:

- ▶ The role of government should be limited to making credit available, not direct implementation.
- ▶ While the terms and conditions of this credit may imply heavy government subsidization, a meaningful (in terms of local socioeconomic conditions) portion of the capital cost should be recovered from the community or "association."
- ▶ The amortization of the loan should extend over a period sufficient for ensuring sound local management of the system.
- ▶ System promotion and construction should, as much as possible, be left to private interests (entrepreneurs, construction cooperatives, contractors, etc.) and NGOs.
- ▶ Consistent promotion of local manufacturing, construction and servicing capacity outside the government sector is thus required, possibly through "sister"-company agreements with foreign firms.
- ▶ There should be standardization of components and streamlining of required imports.
- ▶ There must be review and initiation of necessary legislation with respect to community water rights, fiscal and financial management, revenue collection, etc.
- ▶ Rural credit institutions should be established and/or strengthened.

It should be emphasized that such a policy makes sense only in countries with reasonably established infrastructure and traditions of private entrepreneurship (for instance, Kenya, Nigeria, most of South and Southeast Asia). Furthermore, it also implies a minimum of donor coordination and acceptance of such a long-term policy. However, it does not imply or presuppose that individual donor support should be straitjacketed into operational compliance with such a policy. On the contrary, as argued below, there is still a continuing need for a "basic needs-public provision" approach to RWS, which implies flexible but direct government involvement in the expansion of RWS.

### **Strategy: From Need to Demand--Enabling a Choice**

As mentioned in Chapter 5, one of the findings of the study deemed important for ensuring users' commitment to, identity with, and responsibility for a community system was that individuals must have a choice of joining or not joining, just as the community as a whole had a choice of initiating or doing without an improved water supply. In other words, a prerequisite for a community management model such as that found in the United States is a

pre-existing level of access to reasonably safe water—whether from individual or neighborhood wells, water purchasing arrangements, or otherwise.

Not only does this access permit a choice at the individual as well as the collective level, but it also furnishes a choice one step removed from sheer necessity or survival. It also provides a basis for appreciating (and putting a price tag on) the more invisible, less immediate benefits of a community water system, namely, time savings, water quality, personal and domestic hygiene, social status and achievement, and so forth. While this certainly warrants closer study, the case studies from Mississippi and Texas strongly suggest that this appreciation of benefits, much more than levels of income or health awareness, accounted for the initiation and management of the community systems.

It is from this perspective that continued selective adherence to minimum service norms for which the government is the prime instigator makes sense—as a first step and parallel to efforts indicated under the policy guidelines above. If a minimum level of access to reasonably safe water is not created, the social outreach as well as the viability of community management are likely to be endangered. The point is not whether this means minor improvements in traditional sources or the creation of new ones; rather minimum access should ensure a "fallback" position for those most in need and least likely to be able to comply with the cost-recovery requirements of a higher-level system.

With this strategy and the policy outlined above, there is little reason to advocate drastic changes in existing policies, but all the more reason for adding a second phase with a long-term perspective.

### **Community Management and Self-Empowerment**

It is a paradox that the specific component that appears least "translatable" into the context of developing countries is the one that is the hallmark of the FmHA approach—the community management model. From a comparative perspective, there is no other feature of the United States' experience that is as much determined by American traditions and concepts of individual leadership, civic responsibilities, pride in a job well done, and business attitudes and values, as the one embodied within the formalized framework of United States rural water associations. For most small systems in poor areas, management "happened," rather than resulted from a formal set of procedures and rules.

However, the important question is not how it is carried out, but why. Two basic principles can be discerned, both relevant for developing countries. The first is that of **community empowerment**—empowerment to initiate, responsibility to organize, and authority to execute the system. Whatever the formal constitution of the association, it is this empowerment of the individual consumers that in itself provides the basis for community management.

Second, the lack of "bail-out" mechanisms in case community management fails, along with the (admittedly limited) financial stake that every consumer has in the system, puts considerable pressure on the community to ensure a minimal level of operational efficiency.

## **Demonstration Projects: Testing Components and Approaches**

Although this study cannot, and was not designed to, yield directly operational findings, the United States FmHA experience is both explicit and convincing enough to suggest the components of an outline for a demonstration program. Indeed, given the crossroads at which most developing countries stand with respect to rural water supply, and given the need to consolidate and enhance the considerable gains achieved so far, it appears that such a demonstration program, in whole or in part, is both feasible and necessary.

### *Objectives:*

The objectives of the community management demonstration program would be to:

- ▶ Establish user-owned, managed, and operated rural water supply systems;
- ▶ Establish and/or strengthen a rural credit institution, making available construction capital at concessionary interest;
- ▶ Promote and facilitate the involvement of private and/or commercial initiative and expertise in promotion, construction, and maintenance of user-owned supply systems; and
- ▶ Establish and/or strengthen an independent peer-group technical assistance program in support of O & M of the user-owned systems.

### *Components and activities:*

The components and activities of the proposed demonstration project should be:

- ▶ Single-purpose user management—not "community"/local government;
- ▶ Legally and financially responsible membership associations with formally binding statutes, bylaws, etc.;
- ▶ Availability of credit or other funding through a multipurpose rural support agency and/or rural development department, not a sector agency or water department;
- ▶ Members' use of water supply system upon payment of rates;
- ▶ Design, construction, and takeover undertaken at the formal request of the water supply association, not on government directive;
- ▶ Design and construction primarily through private or commercial capacity or "consultancy corporation" within the sector agency or water department;

- ▶ **Direct government involvement limited to financial audit and follow-up action by the rural credit body or rural development department;**
- ▶ **Regardless of the extent of subsidy toward system capital costs, part of the funding always in the form of a repayable loan;**
- ▶ **Rates to be approved by the credit body to include debt servicing on capital investment or loan and cost of operation;**
- ▶ **No promotion of water supply by government or credit body (this does not exclude health education or community mobilization by independent parties);**
- ▶ **Independent or NGO peer group for technical assistance to the system operators or caretakers; and**
- ▶ **Development of concrete and simple system management tools.**

*Preconditions:*

On the basis of the United States' experience, and given the difficult situation in many developing countries regarding the accessibility of potable water, one important precondition for such a demonstration project would be **prior minimal accessibility of reasonably safe drinking water**. As stressed throughout this paper, much of the strength and resilience of user management and financial viability at the systems visited appeared to be strongly associated with the choice factor—of joining the association or not.

Similarly, given the fact that independent technical assistance to system operators or managers hinges on the availability of spare parts, equipment and accessibility to the systems, a reasonably developed infrastructure and commercial or nongovernment distribution network is probably a prerequisite to identifying areas of program implementation.

Finally, because the availability of independent and technical assistance to rural systems is likely to play a much more crucial role in developing countries than in the United States, the involvement of an organization such as the NRW must be integral to the program's structure. The role of such an organization would be to assist in creating a similar body in the program area, and to design and support training programs.

## Issues for Further Study

Again, this study has found that the **availability of choice, to join the user association or not**, is an important determinant of the users' commitment to and identity with the system. To the extent that this is true, it would have a decisive influence on the applicability of the community- or user-management model. A corollary hypothesis implied by the case studies is that demand based on convenience is a more viable (and possibly more prevalent) basis for willingness to pay, and for community or user management, than other perceived benefits (health, land value, etc.).

Another important issue is the **potential impact of private interests as promotive forces for improved rural water supply**—in this case the consulting engineers. How important has this been as an initiating factor of rural water supply in the United States? What or who could play the same "promotion-extension" role in developing countries, and thereby lessen the impression often promoted by government extension efforts that water is a free government service? What are the risks involved?

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## **ANNEX A.**

### **An Overview of the Farmers Home Administration<sup>55</sup>**

The Farmers Home Administration (FmHA) is the credit agency for agriculture and rural development in the United States Department of Agriculture (USDA). In 1986, the agency marked its fifty-first anniversary as a lender of last resort, providing financial and technical assistance in rural America. This service has been provided under the successive names of Resettlement Administration, Farm Security Administration, and Farmers Home Administration.

When established in 1935, the agency's function was to extend loans and grants to depression-stricken families and help them regain self-sufficiency on family farms. Throughout its half century of operation, the FmHA has been concerned primarily with credit and counseling services that have supplemented private sector resources for building stronger family farms. In 1986, farm credit still accounted for almost half of all resources administered by FmHA.

During the last two decades, Congress created additional nonfarm programs of benefit to families and communities in rural areas. These programs have helped to provide safe, modest housing; modern, sanitary water and sewer systems; essential community facilities; and job- and economy-boosting business and industry in rural areas. These are reflected in the current mission statement which directs the FmHA to "serve as a temporary source of supervised credit and technical support for rural Americans for improving their farming enterprises, housing conditions, community facilities, and other business endeavors until they are able to qualify for private sector resources." The FmHA has been a leading force in spreading the outreach of nongovernment lending institutions into rural sectors that lacked access to such financial resources.

In the credit delivery system reaching to the country level that the FmHA has developed over time, approximately 11,000 permanent, full-time employees are engaged in directing FmHA resources from the national office in Washington, D.C., 46 state offices, 267 district offices, and 1,934 county offices serving every rural county or parish in the 50 states and the Pacific Trust Territory, American Samoa, Guam, Puerto Rico, and the Virgin Islands. The FmHA's network of offices enables it to maintain a close relationship with its borrowers.

The FmHA's existing system of personal contacts across the country has established it as a lead agency for rural development. Congress and the administration continually recognize the FmHA's long experience in serving rural communities and farm families. Over the years, FmHA has expanded old services and created new ones.

FmHA loans and grants supplement credit and capital directly available from commercial lenders in rural areas. In most programs, the agency makes loans to qualified

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55. Source: FmHA (1987). *A Brief History of the Farmers Home Administration*. United States Department of Agriculture.



applicants who can find no other sources of financing available on terms or conditions they can meet.

The money loaned by the FmHA comes from collections on previous loans, or from private investors through sale of government securities. In guaranteed loan making, funds are supplied directly to borrowers by commercial lenders, with the FmHA minimizing the lender's risk.

Grants for rural water and waste disposal systems, farm labor housing, home repair for low-income elderly persons, and "self-help" homebuilding by low-income families supplement the agency's rural lending program.

***Water and waste disposal program:*** the FmHA and its predecessor agencies have financed approximately 13,413 water and waste disposal systems in rural areas and towns of up to 10,000 population. Public bodies, nonprofit corporations, and Indian tribes that are unable to obtain credit from other sources at reasonable rates and terms are eligible for assistance. Loan repayment can be made over up to 40 years or the useful life of the facility. Interest rates are based on the current market yield of municipal obligations. Certain loans may be made at a lower rate. Applicants can select the interest rate in effect at the time of loan approval or closing. In some cases, grants can be made to reduce user rates to a reasonable level for farmers, ranchers, and rural residents.

## ANNEX B.

### FmHA Water and Waste Disposal Grants, 1977-1987<sup>56</sup>

**Program Objective:** To provide basic human amenities, alleviate health hazards, and promote the orderly growth of the rural areas of the nation by meeting the need for new and improved rural water and waste disposal systems.

**Legislative Authority:** The Consolidated Farm and Rural Development Act, Section 306 (7 U.S.C. 1926) as amended.

#### Funds obligated and number of loans and grants made by Fiscal Years:

Fiscal Year	Loans		Grants	
	Number	Amount	Number	Amount
1977*	2,048	748,850,430	1,430	346,385,600
1978*	1,702	749,995,800	1,464	303,909,640
1979	1,802	899,999,920	1,066	291,600,000
1980	1,825	700,000,000	1,011	298,734,000
1981	1,768	749,999,980	788	210,390,380
1982	928	375,000,000	444	133,812,890
1983**	1,184	600,000,000	630	313,160,570
1984	645	270,000,000	276	103,741,820
1985	783	340,000,000	368	128,988,335
1986	698	325,380,000	343	119,318,180
1987	679	330,380,000	319	117,663,250

\*Includes drought projects for which \$150 million FmHA loan funds and \$7 million FmHA grant funds were appropriated.

\*\*Includes Jobs Bill (P.L. 98-8) projects amounting to \$225 million in loan funds and \$150 million in grant funds available for water and waste disposal projects.

56. Source: FmHA Headquarters, Washington, D.C.



## ANNEX C.

### General Description of the National Rural Water Association<sup>57</sup>

#### *General*

The National Rural Water Association (NRWA) is a nonprofit state membership organization whose headquarters is in Duncan, Oklahoma. The NRWA serves as a channel through which rural water and sewer systems can mutually benefit in a number of areas:

- ▶ Through its affiliate state rural water associations, NRWA provides training and technical assistance for approximately 50,000 rural water and sewer systems throughout the country.
- ▶ The NRWA provides loan servicing and technical assistance to 4,100 systems with \$1.9 billion in loans owned by the private sector due to the loan asset sale by the United States Government in 1987. These systems are located in all 50 states and Puerto Rico.
- ▶ The NRWA and its affiliate state associations provide an organized network for representation with all levels of government and industry. This includes legislative representation and executive branch representation, such as participation in an advisory capacity to EPA for regulations affecting small water and sewer systems.
- ▶ The NRWA provides a variety of auxiliary programs through its affiliated corporation, Rural Municipal Services, including:
  - Simple and economical standardized retirement plan for small systems
  - Insurance program for small systems
  - Credit card program
  - Travel agency

The NRWA has an annual budget of \$7.1 million with revenues from member dues, federal contracts, private industry contracts and other association programs. The NRWA and its state affiliates employ about 140 persons. Each of the state affiliates maintains an office that is the focal point for small system assistance and representation.

#### *Training*

A primary reason for organizing the NRWA was the lack of training and technical assistance available to small rural water and waste systems. NRWA training and technical assistance endeavors concentrate on hands-on assistance and self-help training efforts. Each state affiliate office employs, at a minimum, a Program Manager, a Circuit Rider and a

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57. Source: NRWA

**Secretary-Bookkeeper.** The Program Manager administers training programs, provides part-time technical assistance and serves as the General Manager for state activities. The Circuit Rider provides on-site assistance to a minimum of 35 water and waste water systems each month. This assistance is rendered for all types of operation, maintenance and management problems. Circuit Riders are required to have at least five years of operation experience with a rural utility system before being eligible for the position.

The NRWA has designed a simplified bookkeeping system for small rural utilities that has been endorsed by the United States Farmers Home Administration (FmHA) and implemented throughout the country.

During calendar year 1987, 18,000 waterworks personnel attended NRWA-sponsored training sessions, and 24,000 on-site technical assistance visitations were conducted. Since organization of the NRWA, small-system compliance with safe drinking-water standards established by the United States Environmental Protection Agency (USEPA) has dramatically improved. Also as a consequence, delinquency of present FmHA Water and Waste Water loans has fallen from over 4 percent to less than 1 percent. NRWA training and technical assistance programs are hardly the only factors that have been helpful in achieving compliance with safety standards and a low loan-delinquency rate, but the NRWA has played a major role in stabilizing water and wastewater systems.

### ***Loan Servicing and Technical Assistance***

The USFmHA sold \$1.9 billion of low-interest small water- and waste-system loans to the general public at market price during 1987. The sales were made through a large private-sector trust. The NRWA has a 40-year contract to provide loan servicing and technical assistance to rural water- and waste-system borrowers.

The NRWA has become the conduit between these rural system borrowers and the General Electric Credit Corporation (GECC), which provides the financial servicing for the trust. Together, these organizations have insured a smooth transition of loan asset ownership from the government to the private market.

### ***Government and Industry Representation***

The NRWA provides ongoing representation for small water and waste systems with state and federal legislation and with governmental agencies. A board member of the NRWA sits on the United States Drinking Water Advisory Council, and the EPA consistently seeks the advice of the NRWA when setting health standards for small water and waste systems.

### ***Rural/Municipal Services (RMS)***

RMS is a wholly owned subsidiary of the NRWA. Through this subsidiary, the NRWA provides a variety of group services for small rural water and waste systems that could not be economically obtained individually.

***Retirement Plan:***

The RMS developed a prototype money-purchase type retirement plan in 1986 for employees of water and waste systems. The plan is designed for simplicity and economies of operation. Presently, the plan has 52 water and waste systems plus \$290,276, and it is growing rapidly.

***Insurance:***

The RMS has developed packaged insurance plans through Alexander and Alexander of Denver, Colorado. The systems would not be able to obtain such plans individually.

***Credit Card Program:***

The RMS has developed a credit-card system through the Rocky Mountain Bank and VISA. This allows part of the profits from credit cards to be retained by the members through the association.

***Travel Agency:***

The RMS has recently established a travel agency. This also, in effect, allows member travelers to retain part of the profits from airline and other sales related to travel.



**ANNEX D.**

**Model Format for Water Users Agreement**

**WATER USERS AGREEMENT**

This agreement entered into between the \_\_\_\_\_, a nonprofit corporation, hereinafter called the "Association," and \_\_\_\_\_, member(s) of the Association, hereinafter called "Member."

**WITNESSETH**

Whereas, the Member desires to purchase water from the Association and to enter into a water users agreement as required by the Bylaws of the Association.

NOW THEREFORE, in consideration of the mutual covenants, promises, and agreements herein contained, it is hereby understood and agreed by the parties hereto as follows:

The Association shall furnish, subject to the limitation set out in its Bylaws and Rules and Regulations now in force or as hereafter amended, such quantity of water as Member may desire in connection with Member's occupancy of the following described property:

**EXAMPLE:** Lot 1 Section 1 of the Green Valley Subdivision fronting 52 feet on Highway No. 620 containing 1/2 acre joined on the East by John Jones and on the West by Pete Smith; or 162 N. South Street, Springfield, Virginia.

The Member agrees to grant to the Association, its successors and assigns, a perpetual easement in, over, under and upon the above-described land, with the right to erect, construct, install, and lay, and thereafter use, operate, inspect, repair, maintain, replace, and remove water pipelines and appurtenant facilities, together with the right to utilize adjoining lands belonging to the Member for the purpose of ingress to and egress from the above-described lands.

The Member shall install and maintain at the member's expense a service line which shall begin at the meter and extend to the dwelling or place of use. The service line shall connect with the distribution system of the Association at the nearest place of desired use by the Member, provided the Association has determined in advance that the system has sufficient capacity to permit delivery of water at that point.

The Member agrees to comply with and be bound by the Articles, Bylaws, Rules and Regulations of the Association, now in force, or as hereafter duly and legally supplemented, amended, or changed. The Member also agrees to pay for water at such rates, time, and place



as shall be determined by the Association, and agrees to the imposition of such penalties for noncompliance as are now set out in the Association's Bylaws and Rules and Regulations, or which may be hereafter adopted and imposed by the Association.

The Member agrees to pay a deposit in the amount of \$ \_\_\_\_\_. In the event service to the Member is terminated, either voluntarily by the Member, or by the Association for cause, the deposit shall be held and applied by the Association to any unpaid balance then owing on the Member's account. Should the account be fully paid at the time of termination of service to the Member, the deposit shall be refunded by the Association within a reasonable time thereafter.

The Association shall purchase and install a cutoff valve and may also include a water meter in each service. The Association shall have exclusive right to use such cutoff and water meter.

The Association shall have final authority in any question of location of any service line connection to its distribution system; shall determine the allocation of water to Members in the event of a water shortage; and may shut off water to a Member who allows a connection or extension to be made of the member's service line for the purpose of supplying water to another user. In the event the total water supply shall be insufficient to meet all of the needs of the Members, or in the event there is a shortage of water, the Association may prorate the water available among the various Members on such basis as is deemed equitable by the Board of Directors, and may also prescribe a schedule of hours covering use of water for garden purposes by particular Members and require adherence thereto or prohibit the use of water for garden purposes; provided that, if at any time the total water supply shall be insufficient to meet all of the needs of all of the Members, the Association must first satisfy all of the needs of all Members for domestic purposes before supplying any water for livestock purposes and must satisfy all the needs of all Members for both domestic and livestock purposes before supplying any water for garden purposes.

The Member agrees that no other present or future source of water will be connected to any waterlines served by the Association's waterlines and will disconnect from the present water supply prior to connecting to and switching to the Association's system and shall eliminate their present or future cross-connections in the member's system.

The Member shall connect the service lines to the Association's distribution system and shall commence to use water from the system on the date the water is made available to the Member by the Association. Water charges to the Member shall commence on the date service is made available, regardless of whether the Member connects to the system.

In the event the Member shall breach this contract by refusing or failing, without just cause, to connect a service line to the Association's distribution system as set forth above, the Member agrees to pay the Association a lump sum of Three Hundred Dollars (\$300.00) as liquidated damages. It is expressly understood and agreed by the parties hereto that the said amount is agreed upon as liquidated damages in that a breach by the Member in either of the respects set forth above would be difficult, if not impossible, to prove the amount of such damages. The parties hereto have computed, estimated, and agreed upon said sum in an attempt to make a reasonable forecast of probable actual loss because of the difficulty of estimating with exactness the resulting damages.

The failure of a customer to pay water charges duly imposed shall result in the automatic imposition of the following penalties:

1. Nonpayment within ten days from the due date will be subject to a penalty of ten percent of the delinquent account.
2. Nonpayment within thirty days from the due date will result in the water being shut off from the customer's property.
3. In the event it becomes necessary for the Association to shut off the water from a Member's property, a fee set by the corporation in its rate schedule will be charged for a reconnection of the service.

IN WITNESS WHEREOF, we have executed this agreement this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_.

**SEAL**

(Name of Association)

**ATTEST:**

**By:**

\_\_\_\_\_

President

\_\_\_\_\_

Member

\_\_\_\_\_

Member

\_\_\_\_\_

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