

# **Scaling Up Water and Wastewater Access in Low-Income Rural United States Communities: The Role of the US Technical Assistance Network.**

## **A Case Study Model on Scaling Up Water and Sanitation**

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## LIST OF ABBREVIATIONS

AML	Abandoned Mining Lands
BMP	Best Management Practices
CDBG	Community Development Block Grant
CDC	Community Development Corporation
DEH	Department of Health
DNR	Department of Natural Resources
EFC	Environmental Finance Center
EFCN	Environmental Finance Center Network
EPA	Environmental Protection Agency
HHS	Health and Human Services
HIS	Indian Health Service
NDWC	National Drinking Water Clearinghouse
NDWP	National Demonstration Water Project
NESC	National Environmental Services Center
NETCSC	National Environmental Training Center for Small Communities
NGO	Non-governmental Organization
NRWA	National Rural Water Association
NTEC	National Tribal Environmental Council
OCS	Office of Community Services
OEO	Office of Economic Opportunity
PSD	Public Service District
PUB	Public Utility Board (water board)
PUD	Public Utility District
RCAP	Rural Community Assistance Partnership
RO	Reverse Osmosis
RUS	Rural Utilities Service
RWA	Rural Water Association
SDWA	Safe Drinking Water Act
SNEEJ	Southwest Network for Environmental and Economic Justice
SRF	State Revolving Funds
SWOP	Southwest Organizing Project
TA	Technical Assistance
TAC	Technology Assistance Center
TAP	Technical Assistance Provider
USDA	United States Department of Agriculture
WCWD	Whitley County Water District

## INTRODUCTION:

A combination of trends and forces has led to significant support within the international development community for community-based management of infrastructure such as water. These include: poor success rates in reaching small communities; ideological support for decentralization, privatization, and “smaller government”; fiscal pressures on government; dissatisfaction with top-down systems of the past; and the realities of managing critical infrastructure dispersed in communities that are sometimes great distances from urban metro areas. Increasingly, new water policy frameworks in developing countries are creating a framework built on decentralized and community based water and wastewater management options.<sup>1</sup> While wide support exists for the *notion* of community control of water systems and management of those systems, considerable questions exist about implementing viable and sustainable water systems using this framework.<sup>2</sup> “Scaling up” community management of rural water and sanitation will be critical to supporting sustainable water systems that deliver water services to the currently disenfranchised. A survey of multiple strategies for expanding community based water systems can provide a toolbox of strategies that may work as this strategy is implemented in different nations, regions, and settings.

Many find it hard to believe that the United States of America (US) would have much to contribute to discussions of scaling up water and sanitation globally. The US is arguably the richest nation in the world. This means that dollars available for infrastructure dwarf

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<sup>1</sup> Fonseca, Caterina and Bolt, Eveline. 2002. How to Support Community Management of Water Supplies. IRC Technical Paper Series 37. Delft: IRC International Water and Sanitation Center.

<sup>2</sup> Schouten, Ton and Moriarty, Patrick 2003. Community Water, Community Management: From System to Service in Rural Areas. London: ITDG Publishing.

what is available in most developing countries. Statistically, this is born out by United Nation's statistics on the number lacking water and sanitation internationally. Rounding up percentages, these sources show the US as having 100 percent coverage of water and sanitation.<sup>3</sup> But a glance at history and at numbers behind the statistics, tell a more nuanced story. The US is wealthy, but it also has the greatest disparateness between rich and poor people of industrialized nations. Indeed it has only been recently that low income rural areas have begun to narrow the gap in terms of water services. One of the lessons of the US experience is that bridging that gap and ensuring sustainable water services for (especially low income) rural communities is as much about developing a network that can enable the development of human and social capital (civic infrastructure), as about providing financial and built capital.<sup>4</sup>

This case study will outline the US system of support for rural community water systems. It is a system that is neither purely governmental, nor private sector, but rather is based on decentralized community water systems, supported by government funded intermediary technical assistance (TA) organizations. The TA organizations, and their field workers (TA providers), support small communities in delivering water and sanitation services and maintaining those services over time. While the system should provide food for thought for those concerned with scaling up water and sanitation, those

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<sup>3</sup> See, for example, the water and sanitation statistics available for the U.S. on the WHO and UNICEF websites at [http://www.who.int/docstore/water\\_sanitation\\_health/Globassessment/Global11-2.htm](http://www.who.int/docstore/water_sanitation_health/Globassessment/Global11-2.htm) or at [http://www.who.int/water\\_sanitation\\_health/monitoring/en/Glassessment11.pdf](http://www.who.int/water_sanitation_health/monitoring/en/Glassessment11.pdf) - page 3, and at [http://www.childinfo.org/eddb/water/Euroam/usa\\_water1.pdf](http://www.childinfo.org/eddb/water/Euroam/usa_water1.pdf)

<sup>4</sup> Flora, Cornelia Butler and Jan L. Flora. 1993. "Entrepreneurial Social Infrastructure: A Necessary Ingredient." *The Annals of the American Academy of Political & Social Science*. 529: 48-58. Financial and Built Capital are the physical and built infrastructure that we usually think about as fueling community development. However, the management of physical infrastructure is dependent on human capital, including skills, knowledge, ability and well-being, and social capital—existing or developed networks of interaction in and outside community.

implementing this system have much to learn from the experience in developing countries of the importance of participatory approaches to these issues. An understanding of the historical and present statistics on water and sanitation in the US provides an important context.

## HISTORY OF WATER AND SANITATION IN THE US

The US has made great progress over the last 50 years in providing its residents access to improved water and sewer facilities. In 1950, 27 percent of all households in the country lacked access to complete plumbing for water and sanitation, with 50 percent of rural households and 11 percent of urban households lacking services access. Significant rural infrastructure investments by the federal and local governments through the 1950s and 1960s led to a dramatic decrease in the households without proper plumbing facilities. By 1970, only 5.9 percent of all US households lacked piped water, with 14.5 percent of rural and 3.1 percent of urban households lacking proper plumbing facilities. By 1990, the US had installed basic plumbing infrastructure for more than 99 percent of its citizens. Most of the people who lacked plumbing services were elderly, poor, and living in rural areas—and rural households were still four times as likely as urban households<sup>5</sup> in 1990 to lack proper plumbing. By 2000, the overall population who reported lacking either piped water, sanitation, or bathing facilities in their homes was down to 0.64 percent overall, just over 1.0 percent in rural areas. (See Table 1.)

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<sup>5</sup> See, *Still Living Without the Basics: A Report on the Lack of Complete Plumbing That Still Exists in Rural America*, Rural Community Assistance Program, Washington DC, 1995

**Table 1: Percentage of Occupied Housing Units Lacking Complete Plumbing Facilities, 1950–2000<sup>6</sup>**

% of occupied housing units lacking plumbing (U.S.)	1950	1960	1970	1980	1990	2000
Rural	56	31.5	14.5	4.5	1.9	1.0
Rural – farm	55	NA	NA	3.9	NA	1.2
Urban	11	8.2	3.1	2.2	0.5	0.5
Total	<b>27</b>	<b>14.7</b>	<b>5.9</b>	<b>2.7</b>	<b>0.78</b>	<b>0.64</b>

That said, according to the 2000 Census, there are almost 1.8 million US citizens who still lack complete plumbing and sanitation.<sup>7</sup> These include communities such as Alaskan Tribal communities, where residents often melt snow in the winter for a water source and pull water from streams in the summer. Likewise these include populations of American Indians who still pull water from nearby surface water sources. It includes many others who live without either water, wastewater or bath facilities, or in many cases all three.

Additionally, the citizens of the US on average pay a lower proportion of their income than most other peoples for the water and sanitation they receive. But even this figure has important caveats. While water and sanitation rates remain below 2 percent of annual income for the majority of citizens, studies indicate that those rates have doubled in the last decade. Those who work in rural areas say there are many communities where residents pay more than five percent of annual income for water and sanitation services—

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<sup>6</sup> Figures in this table are from the Decennial US Census survey information—the so-called “long form”, a survey done in conjunction with the US Census and distributed to about 1 in 6 households. For more information see, <http://www.census.gov/Press-Release/www/2002/sumfile3.html>. (Accessed, May 31, 2005.)

<sup>7</sup> See Still Living without the Basics in the 21<sup>st</sup> Century, Rural Community Assistance Program, <http://www.rcap.org>, August 2004.

and often for drinking water and sanitation treatment and disposal that is of marginal quality at best.<sup>8</sup>

In addition, some believe that the nation is on the verge of a crisis, as increasing regulations, water infrastructure obsolescence, and budgetary crises minimizing the ability of government to buffer cost lead to rapidly increasing water rates beyond the ability of low-income people to pay without making other sacrifices.

Having said all of this, the US has made remarkable progress over the last 50 years in moving from a situation where more than 50 percent of rural America lacked services. This growth from nearly 1 in 6 rural residents lacking plumbing in 1970 to just over 1 percent by 2000 has been the result of a systemic effort involving government, non-profit organizations, the academic community, and the for-profit private sector. The US model, in fact, exemplifies many of the principles of scaling up rural water and sanitation supply—while it is dependent on community level action, and communities are given significant autonomy, government plays a critical role in capitalizing water infrastructure investment and regulating quality. Government also facilitates non-profit support networks that provide critical assistance to these communities—and in the process often actively work to overcome exclusion from water services based on local hierarchies, prejudices, and power dynamics. This activity facilitates the involvement of the private, for-profit contractors, who tend to provide the engineering services.

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<sup>8</sup> See, McCarthy, John (2004), Anna Mehrotra, Stephen Gasteyer, Rahul Vaswani and Blanca Surgeon, *The Price of Good Water: Water and Sanitation Affordability*. *Rural Matters*, Spring 2004, Washington DC: Rural Community Assistance Partnership.

For instance, the government supported Southwest Community Action Project implemented the National Demonstration Water Project (NDWP) in the community of Hollins, Virginia, in 1969, where these organizations worked to enable residents of that community to provide community-wide water and wastewater services and other facilities that had not been provided through local government entities. While there were no direct efforts to deny this African American community water services, the all White county government and all White government of the city of Roanoke also had done nothing before the establishment of the NDWP to facilitate access to these services. As a result of the NDWP, Hollins has a water system, community center and upgraded housing, and has experienced both significant business and housing growth over the last 35 years.

#### THE US MODEL

Since the 1960s, multiple organizations have emerged to provide technical assistance to small community water systems. In the late 1960s, community organizers recognized that low-income, rural communities were often excluded (in many cases systematically) from access to water services, as more wealthy communities were loath to hook them up to existing water services. The US Office of Economic Opportunity (OEO), established as the implementing agency of the Economic Opportunities Act or the “War on Poverty,” funded pilot programs to work with low income and disadvantaged communities to help them organize to build their own water systems—rather than attempting to link them to existing neighboring community infrastructure.<sup>9</sup> These pilot projects were successful, as

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<sup>9</sup> See, <http://cwx.prenhall.com/bookbind/pubbooks/burns4/medialib/docs/ea1964.htm>, accessed January 6, 2005, for a good overview of the rise, transformation, and fall of the OEO.

local communities were able to organize themselves, and technical assistance (TA) provider intermediaries were able help the community identify financial and technical resources to assist in implementing the water system. Within 5 years OEO was faced with funding 87 such pilots around the US. The implementing non-governmental organizations (NGOs) consolidated into six agencies, which eventually became the Rural Community Assistance Partnership (RCAP)<sup>10</sup>. After the OEO and Community Services Administration were abolished, its programs were folded into the Office of Community Systems (OCS) at the Department of Health and Human Services (HHS) in 1981 (through the Community Services Block Grant Act of 1981). RCAP came to have guaranteed funding “earmarks” in the Office of Community Systems (OCS) of the Department of Health and Human Services (HHS).

In the 1980s, RCAP came to have “earmarked” funding through the USDA Rural Utilities Service (RUS). RCAP served the role of helping to organize communities to receive funding from USDA Rural Development among other sources to finance and maintain capacity of water systems in disadvantaged rural communities. This money is to help rural communities install, expand, or upgrade water and wastewater systems and to ensure that the systems are managed efficiently enough to service government sponsored loans used to capitalize these investments. (See Appendix B.)

RCAP also receives grants from the US Environmental Protection Agency (EPA) to provide assistance to keep small, rural water and wastewater systems in compliance with health and environmental regulations. Lastly, each of the RCAP affiliate organizations

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<sup>10</sup> <http://www.rcap.org>

receives funding from the Department of Health and Human Services (HHS) to help communities with planning around water and wastewater projects, as well as funding from individual states. RCAP specializes in organizing communities and often spends significant time working with the same community to develop decision making capacity, connecting those communities to resources to implement plans of action, and developing management capacity.

RUS provided funding to the National Rural Water Association (NRWA) in 1978, noting that there was a need for technical support for small water system operators. RCAP has traditionally focused on financial and managerial capacity development at the community level, although the organization does have some capacity to work on the technical and operations issues, NRWA was thought to provide more specific technical support services to water operators, specifically through the RUS “small water system circuit rider” program.<sup>11</sup>

NRWA services are actually delivered through separately incorporated Rural Water Associations in each state. It is also a membership organization of small municipal water system operators and now counts as members more than 24,000 water systems. NRWA, thus, provides membership services - including corporate discounts on purchase items, legislative updates, and special education and training campaigns. NRWA also receives significant resources through “earmarks” from the USDA and EPA to provide TA

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<sup>11</sup> See <http://www.rurdev.usda.gov/rd/pubs/1611.pdf>, accessed January 6, 2005

services to small, disadvantaged water systems. NRWA is often contracted by individual states to deliver these services.<sup>12</sup>

RCAP and NRWA represent the front line organizations in delivering TA and building the capacity of the rural communities to implement, manage, and upgrade water and wastewater infrastructure. These two organizations have provided support for an impressive number of small water systems in the US, but the number of small systems is also overwhelming. There are approximately 47,000 small water systems in the US. RCAP works with more than 2,000 community water systems per year.<sup>13</sup>

“[NRWA] State Associations [S/A’s] have historically trained over 40,000 water and wastewater system personnel a year for two decades and provided over 60,000 on-site technical assistance visits a year. Over 2600 ground water protection plans have been adopted by local communities, and another 2300 are in the process of being adopted. NRWA and its S/A’s do more than just talk about a better environment – we make our dreams become reality. We know that regulations don’t protect public health, people do.”<sup>14</sup>

While RCAP and NRWA provide direct TA services to rural community water systems, they are supported in doing this by a combination of government and non-governmental organizations. Indeed, RCAP and NRWA serve as the intermediaries or outreach agents that help move communities toward identifying and addressing problems—often related to regulatory compliance or capacity to meet local water and wastewater needs. In this role, they often facilitate problem identification and development of solutions and financing through identifying and helping with financing applications. Federal agencies, specifically EPA, but to a certain extent RUS as well, provide training materials on best

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<sup>12</sup> Taken from [www.nrwa.org](http://www.nrwa.org), accessed January 20, 2005.

<sup>13</sup> According to EPA, “*Community Water System (CWS)*: A public water system that supplies water to the same population year-round.” See, [http://www.epa.gov/safewater/data/pdfs/factoids\\_2003.pdf](http://www.epa.gov/safewater/data/pdfs/factoids_2003.pdf), accessed February 7, 2005.

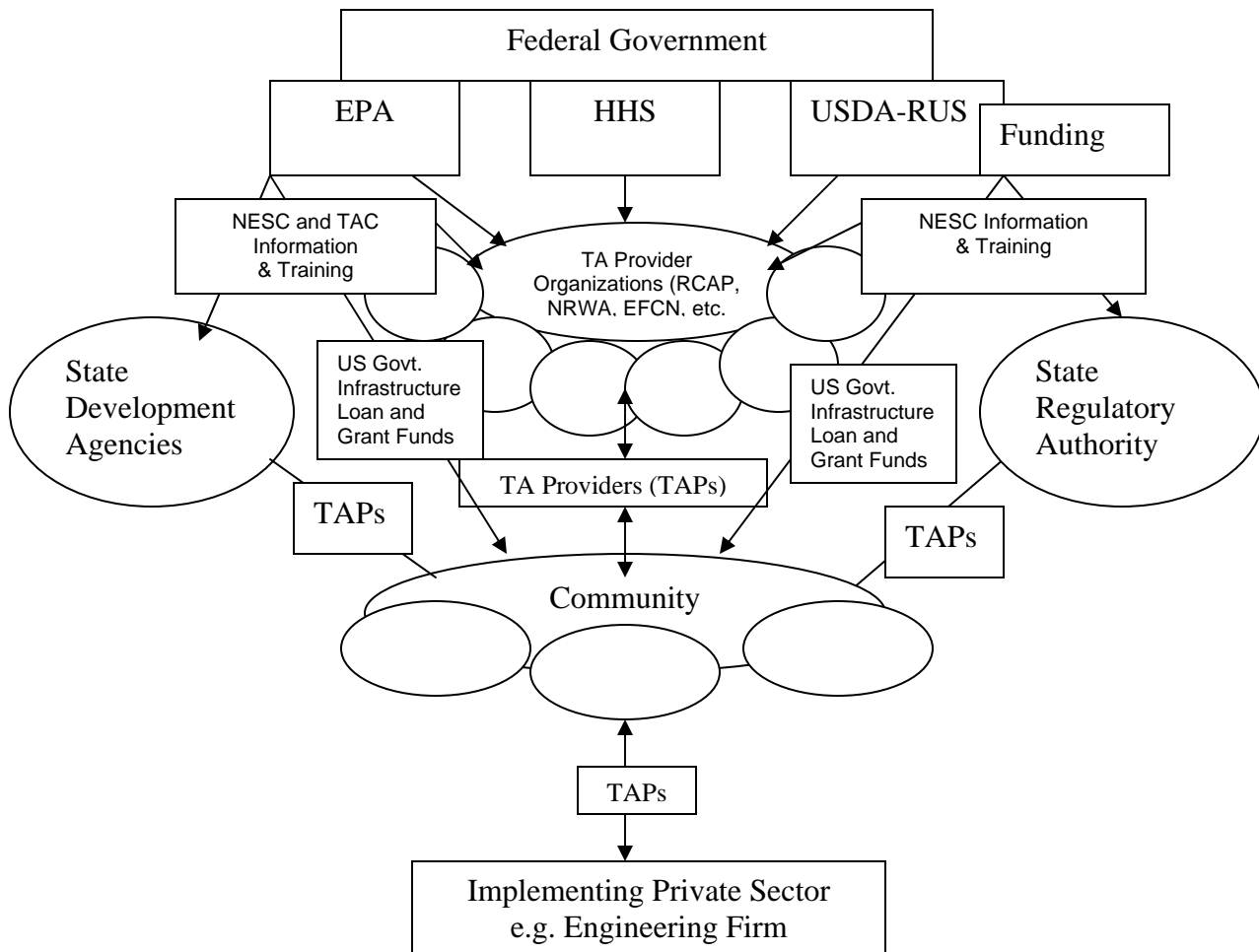
<sup>14</sup> <http://www.nrwa.org/au.htm>, accessed January 25, 2005.

practices and compliance with rules and regulations that are intended for communities. They utilize RCAP, NRWA and other grantees to distribute these materials. They also fund the National Environmental Training Center for Small Communities (NETCSC) and the National Drinking Water Clearinghouse (NDWC)<sup>15</sup>, both part of National Environmental Services Center (NESC) at West Virginia University. NESC produces training materials and demonstrations that aid small communities in water and wastewater management and delivery of services. In addition, university-based training institutes known as Technology Assistance Centers (TACs) provide technical innovations and training materials for community water systems. Community water systems may additionally receive assistance in issues related to financing from the university-based Environmental Finance Center Network (EFCN). All of these non-governmental entities are private, non-profit organizations. In short, RCAP, NRWA, and a handful of others are funded to provide the direct technical outreach to water and wastewater systems in disadvantaged rural communities. They are charged with helping communities to access financial resources from the federal government and state governments, to help communities comply with rules and regulations, and to ensure that information and best practices produced through NESC and others are dispersed to these communities. The TA providers also help the communities to work with the implementing private sector. (See Figure 1.)

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<sup>15</sup> The National Environmental Services Center (NESC) provides information about drinking water, wastewater, environmental training, and solid waste management in communities serving fewer than 10,000 individuals. Within NESC there are two units that are critical to small water systems: The *National Drinking Water Clearinghouse (NDWC) Helping small communities by collecting, developing, and providing timely information relevant to drinking water issues*; *National Environmental Training Center for Small Communities (NETCSC) Assists small communities by providing training and training-related information and referral services in the areas of wastewater, drinking water, and solid waste*;

**Figure 1: Institutional Model for Delivery of Technical Assistance**



This infrastructure of TA and training information is funded largely through various offices of the Federal government (usually as a portion of the low interest loan funds that exist to capitalize infrastructure implementation and improvement in water and wastewater). The non-governmental TA providers, such as RCAP and NRWA officially compete for funding, though many of the base grants are guaranteed through the Congressional budget allocation process. A portion of the EPA and USDA Rural Development funding are generally set aside by the US Congress as “earmarks” to ensure that moneys go to special programs and organizations. Most of the small system TA and information funding for ongoing programs falls into this category. However, as special issues arise, new programs are established, and the TA, research, and information distribution NGOs compete for grants to deliver these programs. For instance, RCAP, NRWA, NESC, and the other organizations listed above competed during 2002-2003 for funding to develop training materials and provide TA to small communities to improve water system security and disaster preparedness. Additionally, newer NGOs have been designated to deliver services to populations deemed to have special needs and concerns—for instance, a special program has been developed to serve American Indian nation water systems, and that grant was awarded to the National Tribal Environmental Council (NTEC).<sup>16</sup>

In short, the TA organization serves as the intermediary between government agencies (Federal, State, Regional/County, and Local), information providers and trainers (TACs, NESC, and EFCN), and communities around improving water and waste management

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<sup>16</sup> See, <http://www.usda.gov/rus/water>, accessed January 20, 2005

and delivery. There are differences in the extent to which the different agencies view water and wastewater as an end in itself or as a means to broader economic development and quality of life improvement. At the government level, water and sanitation programs at HHS and USDA RUS are seen as building the basis for more comprehensive community development. EPA, on the other hand, views its mandate in terms of protecting public health and the environment through supporting the development and maintenance of community water and sanitation. Likewise the state level regulatory and funding agencies approach better water and waste management as an end in itself. Among NGOs, NRWA is focused solely on the implementation and technical operations of water and wastewater systems. Likewise, the TACs, NESC, and EFCs all view their interactions with communities as ending with the development of a water system or resolution of a water problem. RCAP tends to have a more comprehensive approach, focusing more on management, planning, and community economic development issues that may arise from installing, expanding, and upgrading a given water system. The development of community capacity for decision-making and management around water infrastructure options can potentially foster decision-making about community strategic planning, economic, and entrepreneurial development<sup>17</sup>.

Government often uses the TA provider and information providers to help communities achieve compliance with health, safety or capacity standards. The state government “primacy” (regulatory) agency is the institution responsible for upholding water quality and health standards. Community water systems have to adhere to drinking water

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<sup>17</sup> Warner, Dennis and Jarir S. Dajani. 1975. *Water and Sewer Development in Rural America*. Boston: Lexington Books.

standards codified in the US Safe Drinking Water Act of 1974, which was amended in 1986 and 1996 to provide for enforcement at the state/tribal levels. The state agency will often refer RCAP to villages or unincorporated communities<sup>18</sup> that have compliance problems.

While there is some overlap in function, different government-funded TA providers and information providers carry out different functions in providing services to low- income small water systems and communities. Table 2 and Table 3, below, provide descriptions that help to distinguish between the different functions of these organizations. In theory RCAP and NRWA provide different services to communities. NRWA is more technically oriented, tending to act as “circuit riders” who work with water operators at the community level providing assistance on the operations and maintenance aspects of work. RCAP tends to work more with communities on planning, financing, administrative management, and oversight. This should provide for collaboration at the community level. For instance, RCAP may help a community with reassessing and raising water rates to pay for additional treatment costs, but may ask the local RWA circuit rider to do a leak detection study to make sure that the community isn’t losing money through undelivered treated water.

These institutions do compete for contracts with either Federal or State governments for projects outside their earmark. For instance, at the state level, RCAP and the state RWAs often compete for technical assistance contracts to help communities with

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<sup>18</sup> Unincorporated communities are population centers that have not been recognized by the state as having official community status. The defining feature of these places is that they are not counted as a community in the US Census. They may or may not have official structures of local government such as a mayor or town council.

implementation of state level environment, health, and sanitation laws. For instance, the Midwest affiliate of RCAP received state level grants to work on community assessments of source water protection in North Dakota, while NRWA won that contract in Iowa.

Alternatively, these institutions often collaborate on contracts. In the state of New York, for instance, Northeast RCAP and the New York Rural Water Association have a joint contract with the state to provide TA to communities. NE RCAP’s role is to help rural communities with organization, financial and administrative management and strategic planning. NY RWA’s role is to help with direct TA, such as working with small system operators on leak detection. In many cases, particular Federal and State contracts are determined through the political process, where US Congressional or state legislative committees will specify programs intended for these institutions. Likewise, as will be noted below, in states like Mississippi and Louisiana, RCAP and the state RWA simultaneously compete for funding, but also play complementary roles in building on the work of the state Department of Health and the state university office of cooperative extension in ensuring improved small water system management capacity.

TABLE 2: TA Organizations That Serve Small Systems

<b>Institution</b>	<b>Function—TA</b>
<b>NRWA</b>	Located in Duncan, Oklahoma, NRWA is a membership organization of small community water systems throughout the US. NRWA has representation through affiliates in each state where they have field staff made up primarily of water engineers and system operators who work directly with small water system operators to improve operations and maintenance. They have contracts from the Federal government (USDA) to carry out a circuit rider program to trouble shoot water system problems through 30-minute visits. They also have Federal and state government contracts to work with small water systems on the development of source water assessment plans (SWAPs) and on source water protection.

<b>RCAP<sup>19</sup></b>	The network has a central office in Washington, DC, but is made up of institutions in six regions of the US. RCAP works with rural communities and their water system operators helping to develop the capacity to improve water and sanitation access and management. RCAP field workers help communities to organize to decide on and receive funding for installation of water, wastewater, or solid waste systems. TA providers also carry out management, operations, and administrative trainings and technical assistance to improve services, management, and planning.
<b>EFCN</b>	Located at universities around the US with a rotating headquarters, EFCN institutions carry out research and pilot projects to help communities with financial and asset management of their water system. They have played a key role in helping develop models for financial and asset management and community consolidation to improve source water protection and cost savings through improved economies of scale.
<b>NESC</b>	Located at West Virginia University, NESC publishes magazines and articles on best practices and key issues for small water and sanitation systems. They carry out trainings that attempt to consolidate knowledge by other institutions (specifically those listed above) to improve water and sanitation services. They additionally manage a demonstration project for small wastewater management systems, and carry out pilot projects on small system water and wastewater projects to document new technologies and best management practices (BMPs).
<b>TACs</b>	The Safe Drinking Water Act (SDWA) authorized the EPA to make grants to institutions of higher learning to establish and operate small public water systems technology assistance centers (TACs). Together, the TACs and state and federal regulatory agencies work with small water systems to assist them in acquiring and maintaining the technical, managerial, and financial capacity needed to consistently provide safe drinking water and meet the public health protection goals of the SDWA. TACs are currently located in Alaska, Illinois, Kentucky, Missouri, Mississippi, Montana, New Hampshire, and Pennsylvania.

While NRWA tends to focus on the water operator and, less often, the water board, RCAP works directly with communities—either working initially with the local government or with “spark plugs.” Community leaders may be those that are officially elected, but may be motivated individuals or groups in a community. Community elected officials may not be those in the community who are likely to motivate the community to make decisions about solutions to water and wastewater problems, organize, submit grant applications, field bids, oversee installation of infrastructure, and be sure that

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<sup>19</sup> The mission of the Rural Community Assistance Partnership (RCAP) is to help rural people improve the quality of life in their communities. ([http://www.rcap.org/who\\_we\\_are/mission\\_statement.html](http://www.rcap.org/who_we_are/mission_statement.html)); Also see Appendix B (or [http://www.rcap.org/who\\_we\\_are/about\\_rcap.html](http://www.rcap.org/who_we_are/about_rcap.html)).

management is carried out. While RCAP works primarily with local government entities, in cases where the population needing service falls outside of recognized community jurisdiction and there is not a county government entity to provide water services, RCAP's role is to establish a local NGO that can apply for project financing, and help the ad-hoc community see the project through to completion. These NGOs may take several forms<sup>20</sup>:

- **Public Service District:** This entity is usually made up of elected representatives of the community or population served. It is often established through legislative or local government action. The district has implementation and local taxing authority and is primarily responsible for management of the water, wastewater, energy and other services.
- **Public Utility District:** Effectively the same as a public service district, but may be established through a local extra-jurisdictional process (such as elections that cross community boundaries). PUDs are also often established to manage and provide services for an area that encompasses either part of one or more jurisdictions. The PUD is often made up of a representative board, but has the authority to impose tariffs and fines as well as distribute water and sanitation services.

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<sup>20</sup> These non-governmental forms of water system management are generally installed in lieu of an absent municipality, as they generally serve areas outside the jurisdiction of the nearest municipality. The actual form that is used is a matter of state law and code and the extent to which those establishing the water system want taxing as well as technical, managerial, and financial authority. There tend not to be ideological preferences for one NGO management form or another, except in the case of private, or investor-owned utilities which are sometimes selected or rejected for ideological reasons.

- **Public Utility Board:** Elected from community members this entity has responsibility for oversight of the water system. This includes financial responsibility, but not regulatory or implementation authority. Generally, the community public utility board (water board) has responsibility over a hired professional water and/or sanitation operator.
- **Stand-alone system/private entity:** This is a private, either for-profit, investor owned or not-for-profit utility district with a standard for-profit board. The utility district usually has either contracted with the community governing body, or is part of the services structure, as in the case of mobile home parks or homeowners associations. These are not necessarily democratic institutions but rather have a venter-customer relationship with the community. These entities are more prevalent in very small water systems (of 500 or fewer connections).<sup>21</sup>
- **Conservation District:** Conservation districts were initially established to promote the value of conserving soil and water to farmers. Today's districts have evolved; their areas of interest and expertise involve almost every area of natural resource conservation imaginable. This includes water and sanitation. While these entities are specifically mandated to provide community residents with information on how to help people and communities take care of the natural resources, they also occasionally oversee community or even countywide water and sanitation utilities/services. Conservation districts tend to have one or two professional staff, but are generally run by elected community representatives.

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<sup>21</sup> EPA. 2002. Community Water System Survey 2000. Washington, DC: EPA Office of Water EPA 815-R-02-005B, <http://www.epa.gov/safewater>

- Cooperative. Community water system cooperatives are run by a governing board, but involve a membership payment from each of the customers and allow the customers to vote on major changes in the operating procedures. Often, cooperatives are formed through a community wide initiative to install water and sanitation.

Increasingly, RCAP also assists the community to establish relationships with others in the region surrounding the community who are involved in water issues—both for goals such as source water protection and for regionalization to share cost across utilities and communities. These other communities or hamlets (both incorporated and unincorporated) often have the added benefit of providing water and wastewater to residents who live between the communities. This is particularly important for meeting objectives of improved sanitation and water quality.<sup>22</sup>

Requests for assistance may come from communities directly or through referrals from private sector actors, state government, or national, state, or local offices of the Federal government. For instance, RCAP often works with communities that are referred by the state USDA Rural Development officer. USDA Rural Development has a low interest loan program to assist rural communities in water and wastewater management. There are certain organizational requirements that are necessary for the agency to work with communities. RCAP often helps the community to establish an official organization with non-profit status that can receive government loans and grants. RCAP also assists the community to identify various funding sources. This may include accessing low-interest

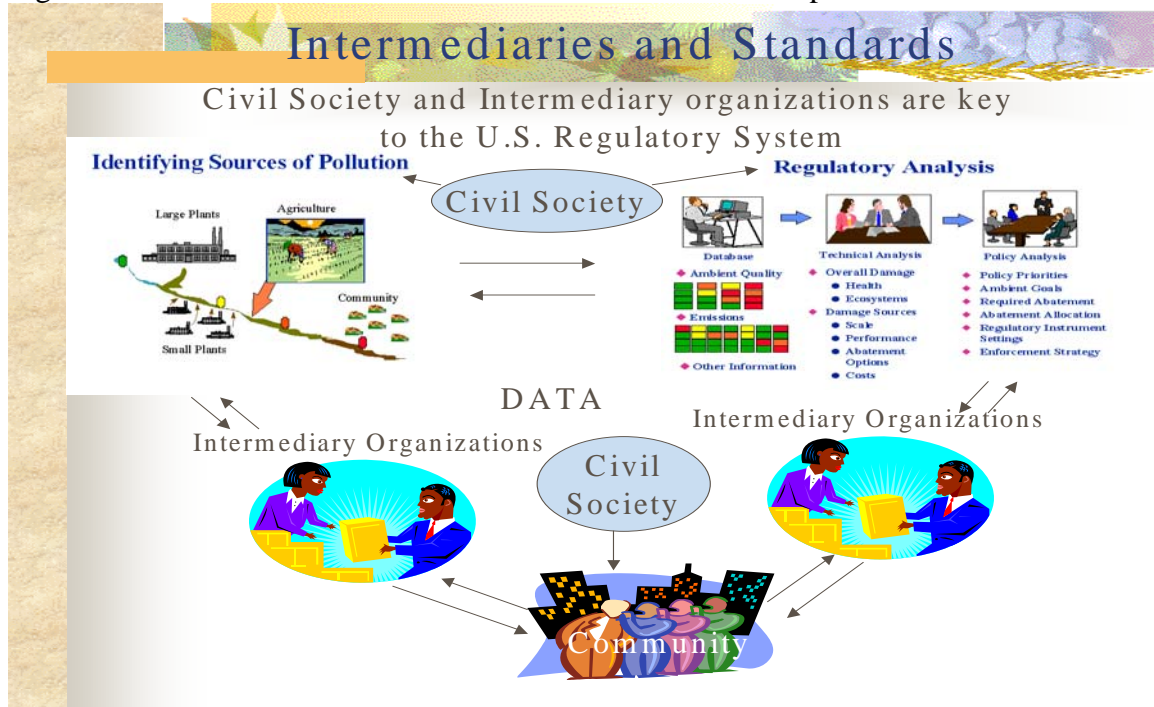
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<sup>22</sup> See Appendix A for a list of activities that TA providers with RCAP provide to communities.

loans available through the EPA State Revolving Funds (SRFs) that provide loans for water and wastewater systems. The TA provider (either RCAP or NRWA) will then help with the bidding process for contractors to install the water or sanitation system and over time with the process of system management. It is notable that RD loans to small water and sanitation infrastructure projects have a default rate of one tenth of one percent since the program started in the 1970s. While the Clean Water (wastewater) and Drinking Water State Revolving Fund loan programs to support community water and sanitation infrastructure and standards compliance have only been in existence since the mid 1980s and late-1990s respectively, the default rate for these loans is also extremely low. One could surmise that the presence of TA providers to work with communities on ensuring loan repayment is critical to these high rates of return.

TA providers frequently work with communities indicated by the Regional office of EPA or the state regulatory agency to help communities to come into compliance with drinking water or wastewater regulations. Often, this involves helping the community to understand compliance orders and to understand options for achieving compliance. This may involve a series of short visits, hands on work with the community to fix the problem, or longer-term involvement with the community to address political, financial, and administrative hurdles. (See Figure 2.)

Figure 2: The Role of TA<sup>23</sup> in Health and Environmental Compliance<sup>24</sup>



Other NGOs may also ask TA organizations such as RCAP for assistance in working with communities. For instance, RCAP has collaborated with the Nature Conservancy in helping communities to install waste water systems that will simultaneously improve quality of life and conserve ecological integrity in the coastal areas of South Carolina. Likewise, RCAP has assisted communities organized by social justice organizations, like the Southwest Organizing Project (SWOP) of New Mexico and the Southwest Network for Environmental and Economic Justice (SNEEJ) to identify options in improving their water and wastewater system for this community. Sanitation supply—while it is dependent on community level action, and communities are given significant autonomy,

<sup>23</sup> In this diagram, TA organizations are termed “Intermediary Organizations” – in other words organizations whose field workers provide a bridge between communities and regulatory organizations.

<sup>24</sup> From Gasteyer, Stephen P. 2002. “Refining Standards: Proposed Principles for International Drinking Water Regulations.” Presented at the Annual Conference of the Association of State Drinking Water Administrators, Salt Lake City, Utah, September 30-October 2, 2002.

government plays a critical role in capitalizing water infrastructure investment and regulating quality. They also often work with Community Development Corporations (CDCs), citizen organizations established to address critical issues for community economic development. Government also facilitates or participates in non-profit support networks that provide critical assistance to these communities—and in the process often actively work to overcome exclusion from water services based on local hierarchies, prejudices, and power dynamics. This activity facilitates the involvement of the private, for-profit contractors, who tend to provide the engineering services.

An example of this is the case of Hopeville, Arizona, an African-American community in the cotton-growing region of Arizona. The community was established by cotton-pickers brought from Louisiana and Texas in the mid-20<sup>th</sup> century. The residents were able to establish a non-incorporated (unofficial) community on state land through activism in the 1970s. The land happened to sit on a high water table - viewed as valuable for the expanding suburbs of Phoenix, Arizona. Developers first tried to buy Hopeville's water rights in the early to mid-1990s. When Hopeville's leadership refused, the developers attempted to use the decaying quality of the water tower and infrastructure to argue that the state should condemn the water system and turn it over to the developers to run it. RCAP TA providers intervened, convincing the Arizona Department of Health to allow Hopeville to develop a plan for addressing the infrastructure and management issues. The TA providers assisted the Hopeville community in identifying the problems, writing grants to raise the resources necessary to address the issue, and procuring a contracting

engineering and construction company to carry out the necessary work. The TA provider also assisted in upgrading the local water operator’s capacity to manage the system.

TABLE 3: HOW COMMUNITIES ARE REFERRED TO THE TA INSTITUTION

<b>Contact Organization</b>	<b>Role in Working with Communities</b>	<b>Perceived Role for TA Institution</b>
USDA State Rural Development	Has an allocated amount of low interest loans/grants to distribute to communities for water and sanitation infrastructure.	TA role is to organize communities to apply for loan/grant funding to support water and sanitation infrastructure.
State Primacy Agency— State Department of Health/Department of Environment	Interested in maintaining compliance with environmental and health regulations.	TA role is to work with communities to improve capacity and ensure compliance with environmental/health regulations.
Environmental Conservation NGOs	Interested in working with communities to protect natural resources.	TA role is to help communities to understand options for environmental infrastructure and resources for implementing those options.
Social Justice NGOs	Interested in empowering disadvantaged communities and improving quality of life.	TA role is to work with communities to help them access resources and understand options in infrastructure development to improve quality of life.
Community Development NGOs	Interested in providing the basis for community economic development, improving quality of life, job retention or creation.	TA role is to work with communities to help them access resources and understand options in infrastructure development to improve economic prospects.

<http://www.cdc.gov/mmwr/preview/mmwrhtml/ss4904a1.htm>

#### **4. Financing:**

TA in the US is funded through multiple means:<sup>25</sup>

<sup>25</sup> See the web site of the USDA Rural Utilities Service: <http://www.usda.gov/rus/water/>, accessed February 2, 2005.

- First, as a percentage of the USDA RD Rural Utilities Service (RUS) loans and grants for community infrastructure;
- Second, through USDA RD RUS loans and grants to help communities to develop the institutional and infrastructural capacity in addressing solid waste issues;
- Third: through grants from US EPA to help communities to achieve compliance with Safe Drinking Water Act Rules and Regulations;
- Fourth: from US EPA to help communities to achieve compliance with Clean Water Act regulations and to upgrade capacity on wastewater and sanitation issues;
- Fifth: From the US Department of Health and Human Services (HHS) Office of Community Services (OCS) to help build community capacity for decision making, management and implementation capacity to improve quality of life through infrastructure development in low income rural communities. HHS-OCS dollars are meant specifically to help lower income communities and households to access new water or wastewater facilities, or preserve and improve public water services and wastewater disposal services in rural low-income areas.
- Sixth: Through grants at the state level to help communities with various aspects of water and wastewater management.
- Seventh: Through regional grants from Federal Agencies to provide TA to communities on issues ranging from water, to waste, to housing, to strategic planning.
- Eighth: Through multi-state regional (for instance for the US Great Lakes Region) grants from philanthropic foundations to support RCAP, NRWA, EFCN, NDWC,

or other TA or information provider organization pilot studies or activities at the community level.

TA services provided through federal grants are free to communities, which eliminates conflict of interest regarding advice given. However, to receive this advice, communities need to meet certain standards in terms of low-income status and population<sup>26</sup>.

Communities that exceed those requirements (e.g. are more wealthy or populous than the requirements for free TA) occasionally contract directly with a regional RCAP, RWA, EFC or other TA provider offices and pay for these services. These institutions often have cost recovery charges for training materials.

#### TA SERVICES DEMANDED AND PROVIDED:

TA providers work with communities on the basis of what the communities request and needs that are assessed on the visit to the community. For instance, a community may ask for assistance with administrative issues because the utility is losing money. The TA provider may suggest that the community carries out a leak detection to make sure that the utility is not having financial problems because of excessive water loss - an issue of construction and maintenance. Likewise, RCAP TA providers frequently help communities that request assistance with system expansion. Often community water systems need to be expanded because of population growth or increased demand to support economic development. Before helping communities to raise the funding and

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<sup>26</sup> In particular, to receive free assistance, communities need have a median income of equal to or below the state non-metropolitan median household income level and should have a population of not-exceeding 10,000 people. (Median income—the income that falls in the middle of the array of incomes from a given place—is thought to be a more accurate measure of community wealth than average income, especially in small communities where one or two very wealthy households can skew the average.)

hire the engineering firm to support this expansion, TA providers also help communities in planning to make sure that system expansion will meet the needs of the community.

**TABLE 4: HOW TA PROVIDERS WORK WITH COMMUNITIES ON CONSTRUCTION (EFFICIENCY) ISSUES**

<b>Conditions for Working on Construction (efficiency) Issues</b>	<b>Manner of Working with Communities</b>
1) When there is a need for system expansion	The TA provider works with the community on assessment of need for the expansion, on improving whole system efficiency and operations (known as optimization), assessing construction options to expand the system, and helping the community to access funding or raise the resources, put the expansion project out for bid to engineering firms, assess the bids, and hire the firm.
2) Where there are capacity issues	The TA provider works with the community to assess the reasons for the lack of water capacity to meet community needs. The TA provider will then work to develop a solution—often digging a new well or developing another source of water that will boost capacity. This will require accessing government or local funds, hiring a well-digging or engineering firm, and overseeing construction.
3) When there are problems in complying with health and safety standards.	Often health and safety problems will necessitate building additional treatment facilities. For instance, high fluoride or arsenic levels will require installation of a reverse osmosis (RO) plant. The process is similar to the steps in the table cells above: providing the community information for a decision about an appropriate technology; development of proposal and background study to access government funding (loan/grant); and helping the community to request and assess proposals by engineering-construction firms and helping with construction oversight.

TA providers also work with communities on service improvement (business planning) strategies. Communities often request these services in response to growth or concern about growth—for instance, in assessing whether they have the water service to support proposed business development. This kind of service may also be requested when a community loses an industry or business that was a major customer of the water system. TA providers can play a role in either case in helping the community and the water system to think through technical, administrative, regulatory, and financing options. A key part of what RCAP does is to help communities to access financing. RCAP TA providers have worked with communities on accessing financing for infrastructure development. Key parts of this process are:

1. Determining what issues the community wants/needs to address;
2. Carrying out income and population surveys to determine eligibility for particular programs;
3. Researching particular funding options—such as the applicability of Community Development Block Grant (CDBG) funding for small cities, or Indian Health Service (IHS) funding for tribal communities;
4. Introducing the community to policy and political leaders to encourage flows of resources through that process.
5. Helping the community to understand and fill out applications for various resources. Related to this is helping the community to understand and meet reporting requirements and deadlines related to the funding requirement.

The TA provider organization plays a key role as a facilitator of partnerships and contracts. The TA provider can play a key role in helping communities to develop intercommunity cooperative or reciprocal contracts (for purchasing equipment, sharing resources, providing emergency resources). Regionalization (inter-community water system collaboration) among municipal utilities is increasingly seen as an option for communities to meet environmental, health and safety, capacity, and security and terrorism readiness requirements. Often, the TA provider can play a key role in helping communities to overcome longtime rivalries or other issues that impede such collaborations. Through the development of formal contracts, and establishing formal processes of interaction, these longtime rivalries may yield joint efforts at source water protection or economic development.

The TA provider can play a key role in helping communities to advertise and assess contracting bids. Key components of this bid include:

1. Helping the community to develop the initial plans for the project.
2. The TAP in some cases will help (or facilitate) the preliminary and environmental engineering assessments/reports that are required to receive funding for the project. In some cases, RCAP will provide seed funding to support these activities through revolving loan funds run through the regional offices of RCAP.
3. The TAP may then help the community in actually designing the request inviting proposals for the project.
4. The TAP often will help the community to evaluate proposals to make sure that they are appropriate for what is needed in the community.

5. The TAP will often check in on construction from time to time to make sure that the engineer is staying on schedule and following recommended standards.

TA providers can play a key role in facilitation of dispute resolution within the community. For instance, in the town of Putney, Vermont, the community was split over the need to put in a new water and wastewater system. Those who had recently paid to upgrade their household systems did not want to pay the cost hooking into a municipal system. Others argued that the town needed such a system to address growing water quality and wastewater concerns. The two factions of the community argued over this difference for almost four years, while the town's water quality degraded from failing septic systems and the water infrastructure problems grew worse. The RCAP TA provider was able to intervene and give an assessment of the scope of the problem that was seen by all factions in the community as unbiased. He also presented options for assessing water rates that would still cover the cost of installation, operations and maintenance that helped the community leadership to find a compromise. As part of this compromise, residents with newer household systems paid discounted hookup fees. With the combination of these options, the community has moved forward in installing a new water and wastewater system.

The TA provider may also play a critical role between the community and outside people/groups/agencies. We have mentioned above the role of TA providers in forging connections with other communities in a given region. The case of Whitley County, Kentucky, below demonstrates another critical role of TA providers. In this case, the TA

provider performed the role of liaison between the community and outside groups who wanted to make an offer on the community water system, and between the community and the Kentucky Department of Natural Resources (DNR) and Department of Health (DEH), who were receiving pressure to crack down on violations of water standards. The relationship to the “primacy” agency is a critical part of RCAP’s work.

## IMPLEMENTATION

Above, we described the historical background of the TA model in the US. It comes out of a commitment on the part of the US government to provide support for all communities that want water and wastewater in the US, Virgin Islands, and Puerto Rico. This includes support for Tribal (American Indian) and Aboriginal (Alaskan Native) communities. Many of the TA and information organizations that exist now are the result of a commitment implemented from the 1970s to improve water service for all in the US.

Currently, the TA model is dependent on several factors:

1. Continued funding from the Federal government to support activities. The federal government has largely been responsible for funding the TA system to date, with some matching funding from state primacy agencies on an as needed basis. Continued federal government funding for technical assistance will be essential, as almost all states are currently in funding crises, even as new regulatory requirements are demanding greater diligence in working with rural communities.
2. Continued funding in grants and loans for small water systems. While the federal government provides funding for the major TA programs, this expenditure could

be in part justified as contributing to the extremely high loan repayment rate by small water systems in the US.

3. Continued interest in allowing communities to maintain autonomy over local water systems—since TA providers must ultimately have community partners to work with. There is increasing interest in regionalization of small community water systems to make them more efficient. This makes sense for some communities, but not others where, for a variety of reasons, hooking into the treatment and distribution systems of a neighboring utility and adopting collaborative management regimes are not practical at the moment. Additionally, while regionalization may eventually diminish the almost 46,000 small community water systems in the US, there are more than 100,000 non-community water systems (ranging from systems serving schools and churches to systems serving isolated small non-community population centers). All of these entities will need assistance in meeting public health standards.
4. A continued mix of ownership and operations systems in the US. The TA model works because the installation of water and sanitation and delivery of those services in the US is carried out through a combination of public actors (local and regional government), non-governmental oversight bodies (community water boards or districts), and private sector actors (engineering firms, equipment suppliers, and occasionally for-profit private sector providers).

## CASE STUDY: BUILDING LOCAL CAPACITY FOR IMPROVED PUBLIC HEALTH THROUGH WATER SYSTEM DEVELOPMENT<sup>27</sup>

### **Whitley County, Kentucky—New Community Water System**

#### **I. Community Context**

The Whitley County Water District is an unincorporated community located in Whitley County in southeastern Kentucky along the Tennessee state line. The area has a steep rugged landscape and a hilly to mountainous topography. According to the 2000 U.S. Census, more than a quarter (28%) or 1,760 of the county's 6,310 residents are low income, and 22% (1,388) of the population is minority (mostly African American).

The county is economically distressed. Median<sup>28</sup> household income (MHI) is low, US\$21,553. The coal industry has been in a state of recession in recent years, with a resulting high rate of unemployment.

This, probably, has had an impact on the state of environmental health in the county as well. The 2000-2001 "State of Kentucky's Environment," cites the county as having failing septic systems and illegal straight pipe discharges from homes and businesses that are polluting the ground and surface water supplies.

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<sup>27</sup> This case study was initially prepared for the Housing Assistance Council Rural Gateway Initiative. See, <http://www.ruralhome.org/gateway/>, accessed February 7, 2005.

<sup>28</sup> Median income is the income that falls in the middle of the array of incomes from a given place. US official community statistics tend to use median, rather than average or mean, as it is less likely to be skewed by one or two wealthy households. In this case Whitley County's median income of US\$21,553 implies that half the households in Whitley county earned less and half more than US\$21,553 in the year 2000.

A practitioner of general medicine within Whitley County stated concerns with the county water sources as he continued to see patients with water borne illnesses. His concerns led to a study carried out by the Whitley County Department of Health as part of a proposed initiative to improve the water services and environmental health in the county. Seventy-one percent of the sampled wells indicated bacterial contamination. Well water was the only source available to rural citizens of the project area. These particular wells not only contained bacterial contaminants but minerals as well. The general practitioner has noted seeing incidences of Shigella, salmonella, certain types of hepatitis, and other bacteria in his practice. In addition, the county health statistics noted a high rate of cancer deaths in the area, including thyroid cancer, which has been linked to water toxins. The high number of cancer deaths prompted a Lexington television news program to investigate. The three-segment story alluded to the water supply being a contributing factor.

The local political administration realized that water was a major issue within Whitley County. Obtaining a potable water supply for all rural county residents became the number one issue of his platform that the County Judge/Executive utilized during the 2002 election. Most of the county's rural residents had private or shared wells with contaminated water. Those few who could afford it were using bottled water.

Citizens within the proposed project area believe the previous administration received funding for this project and spent the funds in other areas of the county. This

administration responded immediately to the outrage of these citizens by procuring an engineering firm.

Local officials realized, however, that they lacked the expertise to obtain user agreements and easements<sup>29</sup> that would make the project possible. They also lacked the knowledge of how to access available funding pools that could provide the necessary capital to underwrite this project. Additionally, they needed help identifying and procuring the expertise to carry out critical pre-project and project activities. They contacted the Rural Community Assistance Program (RCAP) for assistance in these matters.

## **II. The Organization/Agency**

The first phase of the project involved getting the proper water user agreements and easements on property for the water lines in order to demonstrate the local interest in and capacity to put in a new water system. RCAP assisted the Whitley County Water District community by conducting 588 door-to-door visits to obtain user agreements and by obtaining easements. This include 17 households in an abandoned mine land (AML) restoration area.

The RCAP technical assistance provider (TAP) also made contacts and carried out site visits with the Whitley County Water District officials. This allowed the TAP to better understand the capacity of the existing water system to meet the needs of this rural population. As a result of these visits, the TAP helped the county and the Water District

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<sup>29</sup> Easements are the legal designations that allow the use of private land for particular functions—in this case to run piping or other infrastructure necessary in the supply, treatment, and distribution of the water.

to determine that the most cost effective way to resolve the potable water problem would be to extend the existing water distribution line along Highway 92E from the existing water system.

The RCAP TAP facilitated or carried out meetings with the National USDA-Rural Development Senior Environmental Scientist, the USDA-Rural Utilities Service (RUS) Program Director, Rural Development Manager, the Kentucky EPA (KEPA) staff, and other state and federal rural development specialists in the area. These meetings helped create interest in the project among representatives of the federal and state organizations who could provide funding or other types of support. The meetings with KEPA staff ensured as well that the state health and environment regulators understood that a resolution to the problems in the county were in the process of being resolved and to ask that they forestall compliance orders or other regulatory actions that may have been considered.

In addition to procuring a loan from Rural Development for \$1,860,000, the county has been able to match this with a Community Development Block Grant (CDBG) of \$1,000,000 as well as raising \$680,000 from the Abandoned Mining Land Project (AML) of the US Bureau of Interior, and \$100,000 in local moneys<sup>30</sup>. RCAP has assisted the county and the Water District in overseeing the procurement, management and distribution of those resources.

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<sup>30</sup> The Abandoned Mining Lands funds covered those parts of the county where water had been contaminated as a result of abandoned coal mining operations. According to the RCAP TA provider in Whitley County, all other funds went to the general project expenses.

Once the easements had been completed and sufficient water user agreements obtained to allow for the bidding of the last phase of the project, RCAP helped the community to prepare the bid schedule for the bidding of the service lines within the project area. This was part of a loan application submitted to the USDA Kentucky Rural Development office. With the bid schedule prepared, the community was able to move forward in closing the RD Loan for the Hwy 92E Water Line Extension Project. RCAP assisted the Water District with this bidding process to ensure all regulations were met while ensuring the proper installation of service lines.

After the bid opening, the community discovered that the project could be expanded to serve an area beyond the Hwy 92E corridor—and thus provide water to a larger part of the county population. They have asked RCAP to assist through the construction phase of the original scope of work and through the process of the additional scope of work. RCAP has continued to monitor the progress of the installation of service lines within the abandoned mining lands (AML) area. All seventeen households that signed up now have the service lines installed, though only ten of those have actually hooked up using the water<sup>31</sup>.

The District has also recently requested RCAP's assistance with a water loss audit on the original water system. RCAP will facilitate this process, working in collaboration with other organizations and individuals as appropriate.

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<sup>31</sup> This is because of the high hookup cost. Seven households were unwilling or unable initially to pay the hookup fees for water service. The TA provider is currently working with the county to develop a system that would allow these households to actually hook up to water service.

### **III. Resources Used in Project Completion**

This project has been brought to near completion through the work of the Whitley County Water District, with the support of the county executive. To do this, they have used the following resources:

- Rural Development provided a \$900,000 grant and a \$1,860,000 loan.
- The Housing and Urban Development CDBG program provided a \$1,000,000 grant.
- The county raised \$100,000 in local resources grant.
- The county raised \$100,000 from AML<sup>32</sup>.

As is implied from the funding sources, the process of moving this project to completion has involved interaction with multiple local and federal organizations. The RCAP TAP played a critical role in facilitating these connections.

### **IV. Community Impact**

The WCWD-Hwy 92E Water Line Extension Project nears completion with overwhelming success—eighty plus miles of water line was laid verses the forty originally proposed. The project will improve political support for the county elected official who has encouraged the project to move forward. The project will result in potable water supply for the very first time for approximately 640 citizens of Whitley County. It will improve access and reliability of potable water for more than 1,000 additional residents.

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<sup>32</sup> See the footnote #30, immediately before the last footnote.

The health impacts of this investment in infrastructure are expected to be significant. RCAP will work with the county, the state Department of Health, and the general practitioner in the county mentioned above to attempt to track changes in public health and waterborne disease morbidity over time.

This is bound to have an impact on the economic vitality of the community, as it will likely increase the value of housing stock. The availability of piped water services should allow for increased economic development activity as well—though it is too early to measure this impact.

The work with RCAP has also provided the community with access to multiple financial and TA resources that will be useful in managing or expanding the existing infrastructure. Effectively, this amounts to increased community capacity. The county now is organized through a water board under the supervision of the county executive. They have experience in county-wide planning around water issues and know how to ask if resources are available for both the financing and implementation of community development initiatives. The expansion of the county water district has allowed for greater coordination among the municipalities and other population centers in the county. In this case, the decision to work through county government, rather than establish a non-governmental water unit, built county-wide capacity.

## **V. Organizational Impact**

This project provided an opportunity for collaboration among multiple funding and technical assistance entities. In so doing, it demonstrated the role of the TA provider in creating relationships and dialogue among these entities. Because of the clear public health and social justice implications, this case should provide an important example of the good that cross-agency collaboration can produce.

## **VI. Lessons Learned**

Community infrastructure projects, by nature, must be designed to address critical issues of access to water and sanitation in a constantly changing environment. It is very possible to secure community infrastructure resources for unincorporated communities, but this is likely to involve working within the county political process. Certainly, the development of environmental justice and public health claims on the part of the media and the local medical community were important in moving this initiative forward—producing the change in local political administrations that led to local political support for the project. It is notable, however, that even with champions at the local and county level, the TA provider played a significant role in moving this project forward—specifically in carrying out the needs assessment, developing the engineering bids, developing relationships with the funding and regulatory entities and other critical parts of the project process. Community initiative is essential, but intermediaries can help facilitate turning initiative into action.

## LIMITATIONS

In terms of replicating this model in the context of developing countries, the US TA model has advantages and disadvantages. The advantage would be that community TA systems:

1. Could build on existing animation and extension systems that might be in place in the developing countries.
2. Would allow for flexibility since the TA system is implemented through NGOs.
3. Could be funded as a portion of grant and loan programs for small water systems.
4. TA providers play a role in linking communities with funding and other resources that should be available.
5. TA providers also play a key role in linking communities and water system operators to government, NGO, and private sector entities critical to water system development. By doing this they build networks, which ultimately build local capacity for water system management.

What are the main limitations of the model in serving small towns?

- i Funding for TA often is sectorally-based, and NGO TA providers have trouble finding resources to connect water and wastewater TA to broader community capacity and economic development issues—including integrating water utilities with other basic services, such as housing, transportation, and energy production to achieve economies of scope and scale.
- ii Community politics may be the biggest hindrance to well working utilities—limiting what the TA provider can accomplish. Many water and wastewater

projects are held up for years because local political interests have decided not to cooperate with the process. In the case of Whitley County, progress in addressing very serious water quality concerns was not made until a new county executive was elected.

- iii Some TA is purely technical and can be accomplished through short period interactions—technology adjustments, leak detection. This gets the job done, but tends not to build local capacity, as communities generally do not end up with someone who is capable of fixing the problem the next time it occurs.
- iv More lasting TA involves building community capacity—this takes time, building local interest, support, and responsibility. Continual visits over multiple months or even years may be necessary—even after the initial crisis is past. This also costs money. It also will be a growing challenge to develop useful performance indicators.
- v The TA system as run in the US is dependent on federal funding, which is increasingly hard to secure. While funding for TA has dropped only slightly over the last four years, TA organizations are having to spend increasing amounts of energy ensuring that TA line-items are not cut from the federal budget.

APPENDIX A: Technical Assistance Tasks Performed in Communities by RCAP TA Providers (taken from the RCAP training and technical assistance (“Technitrain”) grant proposal to USDA, December 2004.)

**Project Activities**

Below is the list of activities submitted by RCAP Technical Assistance providers through a community specific technical assistance grant with the USDA Rural Development Rural Utilities Service. All services are free to the community. RCAP technical assistance providers work directly on-site with community leaders, system owners, system operators and rural residents to solve particular problems or needs on each project site. Community-specific training brings together operators, owners, system boards of directors and community leaders from neighboring systems or rural areas for on-site training to address shared needs.

RCAP training and technical assistance may include any of the services listed below. The specific assistance provided depends on the needs of the individual communities and as agreed to by RCAP, the community, and the USDA Rural Development office in the state. Similar work is done in conjunction with the state environment and public health agencies.

**More specific work plans can be reviewed in Addendum “A.”**

***RCAP can assist a community with:***

**Capacity Building:** Focused on leadership development, outreach, community organizing or other activities designed to improve community residents’ abilities to make informed decisions

*Assist in formation of legal entity / district*

*Conduct board training*

*Conduct community informational meetings*

*Conduct needs assessment*

*Distribute lending library materials*

*Establish community stakeholder (working) team*

*Establish task force, identify local leadership*

*Evaluate community’s technical, managerial, and financial (TMF) capacity*

*Evaluate identified alternative solutions*

*Help with procurement of engineering / professional services (Requests for Qualifications (RFQ) for contractual services, Requests for Proposals (RFP))*

**Compliance and Environmental Health:** Work that helps a community meet specific regulatory requirements.

*Conduct community informational meetings*

*Conduct needs assessment*

*Evaluate contaminated source and potential for recurrence*

*Negotiate reduction of fines / administrative penalties*

*Prepare bacteria sampling plan*

*Prepare annual reports on water system water quality (called Community Confidence Reports or CCR by EPA). Pursuant to the Safe Drinking Water Act 1996 Amendments, each community water system must produce this report, assessing water quality, actual and potential threats, and plans for mitigation and distribute it annually to the system’s customers.*

*Prepare notices (e.g. boiling orders)*

*Review Compliance Order*

**Disaster Management:** Assistance provided to a community so that they may prepare for a disaster or to handle recovery from a natural or other disaster.

*Assist with development of manual(s)*  
*Conduct disaster / debris management training*  
*Conduct vulnerability assessment (VA)*  
*Coordinate regional response*  
*Meet with the Federal Emergency Management Agency (FEMA) and other pertinent organizations charged with mitigation or response to disasters*  
*Meet with state regulatory “primacy” agencies*  
*Meet with the state USDA Rural Development representatives*  
*Meet with Red Cross*  
*Prepare emergency response plan (ERP)*

**Facilities Development:** Assistance to secure new facilities, or for substantial expansion or renovation of existing facilities

*Assess cost for new connection*  
*Assist in formation of legal entity / district*  
*Assist with project bidding process*  
*Assist with review of pay requests*  
*Assist with water rights / source approval application*  
*Conduct community informational meetings*  
*Conduct income survey*  
*Conduct interest and attitudes survey*  
*Conduct needs assessment*  
*Conduct public hearings / meetings*  
*Design financing plan*  
*Develop rate structure*  
*Educate community for successful bond or referendum*  
*Establish task force, identify local leadership*  
*Evaluate community’s TMF capacity*  
*Evaluate identified alternative solutions*  
*Evaluate potential for regionalization*  
*Facilitate communication between community / system and “primacy” agency or other entities and utilities*  
*Facilitate compliance with Letter of Condition / financing conditions & terms*  
*Facilitate loan / grant application (s)*  
*Facilitate right of way acquisition*  
*Help to complete / review environmental report / assessment (may include archeological work)*  
*Help with procurement of engineering / professional services (RFQ, RFP)*  
*Identify and evaluate potential water source(s)*  
*Monitor construction / inspection*  
*Monitor / expedite plans and specs approval process*  
*Negotiate utility water purchase / wastewater treatment contract*  
*Prepare and obtain user agreements*  
*Prepare cost estimates*  
*Prepare public information notices*  
*Prepare / review ordinances and bylaws*

*Research financial assistance for individual users*  
*Review Compliance Order*  
*Review engineering, professional studies*  
*Review / prepare project budget*  
*Secure interim project financing*

**Planning and Development:** Assistance provided to a community to resolve a specific short-term problem or meet a particular need related to a facility or the planning necessary for a future facility. Long-term onsite assistance is not contemplated.

*Assist with development of manual(s)*  
*Conduct community informational meetings*  
*Conduct income survey*  
*Conduct interest and attitudes survey*  
*Conduct needs assessment*  
*Conduct sanitary survey*  
*Develop and maintain project plan and timeline*  
*Develop rate structure*  
*Develop strategic plan or long range and capital improvements plan*  
*Evaluate potential for regionalization*  
*Facilitate communication between community / system and “ primacy” agency or other entities and utilities*  
*Facilitate loan / grant application (s)*  
*Facilitate regionalization efforts and educational programs*  
*Help to complete / review environmental report / assessment (may include archeological work)*  
*Help with procurement of engineering / professional services (RFQ, RFP)*  
*Identify alternatives and appropriate technology for community*  
*Identify alternatives for site selections of infrastructure*  
*Map proposed system or service area*  
*Prepare public information notices*  
*Prepare / review ordinances and bylaws*

**Operations and Maintenance:** Assistance aimed at improving the day-to-day operation of the system, including diagnosis of operational problems/processes and operator training.

*Assist with development of manual(s)*  
*Assist with repair or replacement of equipment*  
*Assist with submission of required reports*  
*Complete infiltration / inflow study*  
*Complete leak detection / water loss audit study*  
*Conduct an Operations and Maintenance Evaluation (OME)*  
*Conduct community water board training*  
*Conduct laboratory parameter / procedure training*  
*Conduct sanitary survey*  
*Conduct vulnerability assessment*  
*Develop equipment repair and replacement program*  
*Develop inventory plan*  
*Develop operations and maintenance (O & M) plans*  
*Diagnose / troubleshoot operational problems*  
*Educate operators to necessary certification level*  
*Facilitate analysis of water samples*

*Facilitate system abandonment or closure*  
*Identify and prioritize problems*  
*Implement sludge / biosolids disposal plan*  
*Inspect system*  
*Prepare emergency response plan (ERP)*  
*Prepare formal recommendations for resolving O & M problems*  
*Prepare written corrective action plan*  
*Provide operator training on regulatory requirements*  
*Research and evaluate options for sludge / biosolids disposal*  
*Test system equipment and treatment processes*

**Management and Finance:** Assistance to meet managerial and financial capacity guidelines, usually directed at system managers and directors of existing systems, as well as assistance to help set up management systems, bookkeeping, budgeting, rate setting, financial reporting, etc.

*Assess cost for new connection*  
*Assist with development of manual(s)*  
*Assist with submission of required reports*  
*Assist with utility staffing, budgeting, and operational start-up plans*  
*Conduct board training*  
*Conduct rate study*  
*Develop rate structure*  
*Develop bookkeeping and billing system*  
*Develop / evaluate policies and procedures*  
*Develop strategic plan or long range and capital improvements plan*  
*Evaluate community's TMF capacity*  
*Evaluate potential for regionalization*  
*Facilitate budget analysis*  
*Facilitate utility water purchase / wastewater treatment contract negotiations*  
*Negotiate utility system management contract*  
*Prepare costs recovery analysis*  
*Provide bookkeeper training*

**Source Water Protection:** For projects whose sole purpose is to protect drinking water supply

*Complete delineation of watershed / wellhead protection area*  
*Complete hydro-geologic study*  
*Complete management plan*  
*Complete watershed / wellhead survey / monitor*  
*Conduct community informational meetings*  
*Develop watershed protection program*  
*Develop wellhead protection program*  
*Establish task force, identify local leadership*  
*Identify and evaluate potential water source(s)*  
*Implement watershed / wellhead protection program*  
*Inventory potential sources of contamination (PSOC's)*

## **Appendix B: Rural Community Assistance Partnership**

### **About RCAP**

Nearly a million people living in rural areas still have no indoor plumbing. Millions more live with inadequate water sanitation systems, creating circumstances that threaten drinking water, public health, and the environment. Most of the nation's water systems are located in rural America, where poverty rates are disproportionately higher than in urban areas and educational opportunities are fewer. Not surprisingly, many rural communities lack the financial resources and the technical expertise to develop or maintain critical infrastructure systems.

Water infrastructure is intimately connected with quality of life. It relates directly to a community's capacity to revitalize its economy, to promote business development, and to create new job opportunities that offer residents viable alternatives to outward migration. Without adequate water systems, rural communities cannot achieve their full economic development potential. Poor communities lack the connections to government and other resources to minimize costs and to rapidly address water system problems as they arise.

This is where RCAP comes in. RCAP and its regional partners help to connect rural communities, as well as Native American and tribal communities, with the resources they need to obtain the quality of life they want and to meet the requirements of federal laws and regulations. RCAP and its partners also offer information on what resources are available and how other communities have solved similar problems. RCAP partners provide hands-on technical assistance to rural communities as they work to meet their needs. RCAP also serves as the rural community's advocate in regulatory proceedings and in rural associations and coalitions.

RCAP's programs are targeted to rural communities with populations of fewer than 10,000 people. It specializes in building the capacity of rural residents of communities with populations under 3,300. Through its regional partners RCAP assists these small, often diverse and economically disadvantaged communities in finding sustainable solutions to community concerns. RCAP's services are made possible to communities by grants from the U.S. Department of Agriculture/Rural Utility Service, U.S. Department of Health and Human Services/Office of Community Services and the U.S. Environmental Protection Agency. They are available to elected officials, utility owners and operators, community leaders, and others living in rural communities. These services help people to:

- Gain access to safe drinking water supplies
- Treat or properly dispose of wastewater
- Protect groundwater supplies and watersheds
- Plan and finance infrastructure projects
- Responsibly manage and operate community facilities
- Build leadership capacity in the community
- Understand state and federal environmental regulations and requirements
- Conduct vulnerability assessments and develop emergency response plans
- Improve or expand solid waste collection and recycling options
- Develop a vision for the future in their communities