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# PUBLIC EDUCATION AND OUTREACH STRATEGIES IN DECENTRALIZED WASTEWATER MANAGEMENT

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## ABSTRACT AND BENEFITS

In the last decade, the EPA has pulled together a public education and outreach strategy in decentralized wastewater management, primarily to educate homeowners on the need to maintain their onsite systems. In addition, the strategy is meant to advance the concept of “centralized management of decentralized systems.”

Industry advocates and universities have also developed educational materials on decentralized technologies and management institutions for homeowners, elected officials, and other organizations. This White Paper discusses several concepts for redirecting the public education and outreach strategies that emerged from a series of workshops organized by the Coalition for Alternative Wastewater Treatment. These concepts include:

- ◆ Exploring the multiple benefits of an integrated water resource infrastructure paradigm—enhancing the “value proposition”
- ◆ Focusing on “early adopters” and “champions” rather than the general public and mainstream institutions
- ◆ Working more with “mediating institutions,” including non-governmental organizations (NGOs) and other non-traditional businesses and professions, including environmental and community groups, architects, builders, and others outside the mainstream water field
- ◆ Respecting the public’s attitudes about their private property and personal choices and revising management recommendations to reflect those values
- ◆ Developing non-regulatory approaches, such as social marketing and incentives

This White Paper is not intended to provide a blueprint for all facets of a complete Public Education and Outreach Strategy, but rather to suggest some new ways of thinking about strategies to engage public and NGO participation in building a more sustainable infrastructure.

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## Chapter 1

# BACKGROUND

In the 1997 *Response to Congress on Use of Decentralized Wastewater Treatment Systems*, the EPA identified a barrier: “Lack of Knowledge and Misperception of Decentralized Systems.” With regard to the public, the EPA stated: “*Homeowners are frequently uninformed about how their conventional onsite systems work, how to maintain them, and about the potential for human health and ecosystem risks from poorly functioning systems. The prevailing public perception of conventional onsite systems is they are maintenance free.*” (EPA 1997)

The EPA suggested overcoming the public’s knowledge barrier through education. “*Educational materials for homeowners should explain proper wastewater disposal and maintenance practices and the consequences of system failures. Informed, responsible homeowners would help ensure that their systems are operated and maintained properly, and they will be more likely to support new management programs. Training and education to increase awareness about decentralized wastewater systems should help reduce both the number of failing systems and adverse impacts on ground and surface water.*” The report also suggested that the benefits of management programs were:

- ◆ Better onsite system performance and environmental protection
- ◆ Extended life of the system
- ◆ Significant cost savings
- ◆ Planning flexibility
- ◆ Assistance for individual homeowners and developers in meeting requirements
- ◆ Economic benefits accruing from the use of local contractors

In the ten years since the release of the report, the EPA has released several homeowner guides on how onsite systems operate. It has signed a Memorandum of Understanding (MOU) with a dozen organizations to disseminate information on decentralized wastewater treatment technologies and management. As described in the 1997 report, much of the emphasis of the education and outreach strategy has been to garner public support for the adoption of professional management programs for their systems. The National Small Flows Clearinghouse has also provided information about treatment units and management to a wide range of audiences, and has produced flyers, videos, and other promotional materials.

The EPA has issued several guidance documents, in which it has presented five models for decentralized wastewater system management. The models allocate responsibilities for planning, design, installation, inspection, and operation and maintenance in various ways among the homeowner, public or private management entities, and oversight environment and health agencies (EPA 2003). Only scattered examples of these and other hybrid models have been implemented across the country in recent years. The recent National Rural Electric Cooperative Association (NRECA) study by Tom Yeager, Ray Ehrhard, and John Murphy has highlighted how few management programs have been organized across the country in recent years (Yeager 2006).

The National Decentralized Water Resources Capacity Development Project (NDWRCDP) research program has funded several projects related to public education and outreach. The Primen study examined data from a survey of homeowners in North Carolina, in which lack of awareness on the causes and impacts of failing septic systems was evident. Homeowners were willing to consider utility or private contractor management of their systems, but were unwilling to pay the level of monthly rate that would be required to cover such services (McKee 2003). A report on lessons from the National Community Decentralized Wastewater Demonstration Projects also highlighted the continuing need to secure increased support from the public for management programs.

The NDWRCDP also funded several projects by the Green Mountain Institute to research community attitudes about wastewater problems and alternative infrastructure approaches, to produce Fact Sheets for the public, and to provide guidance for Community Resource Providers who work, in particular, with small rural communities in helping them sort through their wastewater treatment needs and options.

## Chapter 2

# REFLECTIONS FROM A SERIES OF CAWT WORKSHOPS

This White Paper describes several concepts that emerged in CAWT workshops that can potentially improve the effectiveness of public education and outreach strategies and materials.

### Case Studies Presented in the Workshops

Information and ideas about public education and outreach strategies in the environmental arena were discussed in both the Palo Alto workshop on “Viable Business Models for Decentralized System Management” and the series of workshops in Washington, D.C. These presentations were instructive because the success of decentralized wastewater and stormwater treatment systems depends on the behavior and values of private citizens. These citizens could be any of the following:

- ◆ Customers who choose to install and maintain systems on their property
- ◆ Business leaders that tilt their industry toward “green” products and practices
- ◆ Volunteers for civic organizations who advocate for decentralized solutions
- ◆ Voters who approve of community-side solutions that include decentralized solutions

The following case studies, which pertain to this topic, were presented in the CAWT workshops.

### A Private Land Ethic

Brent Haglund, Director of the Sand County Foundation (SCF) in Wisconsin, described Aldo Leopold’s philosophy for land conservation in 1939: “*A land ethic, then, reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land.*” By 1949, Leopold had come to understand that a land ethic was also needed for conservation on private land to work. “*When land does well for its owner, and the owner does well by his land; when both end up better by reason of their partnership, we have conservation. When one or the other grows poorer, we do not.*”

The Sand County Foundation has focused its projects on developing partnerships and approaches for conservation management on private property. Looking for alternatives to regulation, which Leopold saw as a last step when all else had failed, SCF advocates and develops pilot programs that incorporate local solutions that empower citizens, allow for adaptive management and learning, and use market approaches and incentives.

## **Community Environmental Activism**

Harry Wiland, of Wiland-Bell Productions in Santa Monica, California, described the PBS documentary series “Edens Lost & Found,” which describes efforts to improve the quality of life through urban “greening” in four American cities: Philadelphia, Chicago, Seattle, and Los Angeles. The series also shows how media can be used to reach a wide audience with a compelling message. Along with other media, such as website community-action guides, education curricula, and outreach, this series helps the story get out in ways that the government cannot. Wiland says, “*The film series is the rock in the water that has caused a ripple of information and influence outward.*” Each program describes examples of local citizens envisioning sustainable urban ecosystems, including:

- ◆ Open space and public parks
- ◆ Urban forestry
- ◆ Watershed management
- ◆ Public areas
- ◆ Waste disposal
- ◆ Recycling
- ◆ Green architecture
- ◆ Mass transit alternatives

Through this project, Wiland has come to believe that this movement of community activism and environmental justice is the issue of this era. “*We grew up thinking government would solve these problems for us. We are now realizing that many issues are related (housing, clean air, water, etc.) and we have a direct stake in improving our quality of life. This fact is promoting community knowledge and action.*”

## **Social Marketing**

Nancy Lee, of Social Marketing Services in Seattle, defined social marketing as “*the use of marketing principles and techniques to influence a target audience to voluntarily accept, reject, modify, or abandon a behavior for the benefit of individuals, groups, or society as a whole.*” Social marketing goes beyond education, which just informs people, and is intent on influencing behavior. Social marketing is harder than advertising, because it asks people to be uncomfortable, spend more time and money, and reduce pleasure. Lee described seven key principles:

- ◆ Target markets most ready for action
- ◆ Promote single, simple doable behaviors
- ◆ Understand audience barriers to behavior change
- ◆ Include tangible objects and services that support behavior change
- ◆ Find a price that matters
- ◆ Make access easy
- ◆ Use effective communication techniques

Lee provided several applications of these principles in the environmental arena. Seattle found that the best target market for rainbarrels included avid gardeners, those interested in natural gardening, and those already having compost bins. In general, a social market strategy targets three types of people:

- ◆ **Greens**—they have the values and behavior and just need instructions on what to do
- ◆ **Sprouts**—they have the values, but not yet the behavior, so they need simple opportunities to change their behavior
- ◆ **Browns**—they should probably be left alone, at least in the beginning, since they currently have neither the values nor the behavior that would support the goal of the new program

Lee presented several recommendations for how the government could more effectively change private behaviors, including:

- ◆ Overcoming barriers to change by creating better options and simpler choices
- ◆ Making messages vivid, personal, and concrete
- ◆ Getting pledges
- ◆ Using credible messengers

### **Community Decisionmaking**

Ken Jones, of the Green Mountain Institute for Environmental Democracy in Montpelier, Vermont, has written two reports for the NDWRCDP: “Expanding Communication in Communities Addressing Wastewater Needs,” and “A Status of Tools and Support for Community Decentralized Wastewater Solutions” (Jones 2003). These reports describe community outreach and research on decentralized wastewater management in several communities in Vermont and Virginia. Fact sheets were developed, as well as guidance to community resource providers, such as the Rural Community Assistance Project (RCAP).

In the December 13 workshop, Jones presented his conclusions based on these studies and other background in the field. In general, two dimensions affect community acceptance of decentralized solutions:

- ◆ **Wealth**
  - Affluent communities can afford to be creative
  - Middle class communities are left without options because they are strapped financially
  - Poor communities have access to public resources to fix problems
- ◆ **Density**
  - Urban communities have limited space
  - Growing suburban areas will be concerned about growth
  - Rural communities have generally relied on the perc test to determine buildable land

Rural and urban areas are motivated by sustainability, while the primary motivation of suburban areas is growth management. The primary concern in middle class communities at all densities is cost—how much does it cost and who is going to pay for the system? In general, the motivation is economic development, and may also involve self-help programs.

Implications of these patterns are that new, soft path technologies are not considered opportunities except by a small number of progressive thinkers. The bottom line for many communities is money and there is no strong track record for low cost, soft path applications. The path to new approaches in rural communities is the community resource provider, and in urban areas it is the city manager or utility director.

In general, Jones has found that wastewater and stormwater issues are rarely on the local agenda, unless water quality in a lake or waterfront is threatened. Fancy ideas from out-of-towners are rarely embraced. And, while state and local authorities are respected, it is better to have a local solution. Water quality is rarely the concern that pushes communities to consider wastewater or stormwater management. It usually stems from one of the following pressures:

- ◆ Restrictions on new development unless the infrastructure is upgraded
- ◆ Regulatory pressures
- ◆ Growth management, including issues of water supply and reuse

## **Worldviews and Market Transformations**

David Johnston, of What's Working in Boulder, Colorado, described the green building model and why it works, including the “spiral dynamics” approach to differentiating customers based on their values and worldviews. First, Johnston described the failures in the typical approach to green building:

- ◆ Seeing something wrong, such as resource depletion
- ◆ Finding someone to blame, such as big bad business
- ◆ Preaching to the choir, such as environmentalists
- ◆ Wondering why things don't change

Conventional remedies include:

- ◆ Adopting new regulations to force change
- ◆ Blaming the homebuilding industry for building conventional housing
- ◆ Inventing new green approaches and assuming that they will be adopted
- ◆ Working through environmental groups to stimulate the market, as opposed to working with a range of stakeholders in the building industry

Johnston described the “Integral Model for Market Transformation,” which is based on understanding and leveraging the interests and behaviors of stakeholders, including both buyers and suppliers. Market transformation occurs when the public sector, the nonprofit sector, and the private sector are in alignment. Strategies can include policies and ordinances, ratings systems, websites, and networking. The San Francisco Bay Area “Build It Green Program,” for example, includes builders and remodeling companies, product manufacturers, environmental nonprofit organizations, members of an affordable housing coalition, and a range of municipal agencies.

A key element in the projects of What’s Working is the use of market segmentation concepts according to Don Beck’s “Spiral Dynamics” approach. There are six basic stakeholder worldviews within people, organizations, and markets, each with different value systems and behaviors. Johnston’s examples of these worldviews, with color codes, and how they can be motivated for green building include:

Table 2-1: Johnston’s Worldviews

Color	Description	Solution
Purple	Concern with family security and health	Target their concern for protecting air quality for their children
Red	Values of personal expression, individuality, “beating the system”	Target their desire for self-reliance (off the grid), unique use of straw bale construction
Blue	Traditional values of law and order, “Doing the right thing”	Market energy efficiency as saving money, good for the society
Orange	Achievement goals for status and affluence	Green building for greater profits, real estate appreciation, status
Green	Concerns for equality, community, consensus decisionmaking	Market products to further environmental goals
Yellow	Global concerns, balancing of ecosystems and human development	Appeal to planetary health and the future, transcend the ordinary through holistic solutions

In many instances, environmental protection bureaucracies and advocates have misunderstood their customers. For example, in both the cases of green building and the hybrid Prius, the initial marketing was aimed mostly at Greens (environmentally-oriented buyers). Later, both campaigns shifted to a multi-colored campaign, where the different values of the different constituencies were specifically targeted.

## Early Adoption and Customer Research

Mike Luzier from the National Association of Home Builders Research Center (NAHBRC) in Upper Marlboro, Maryland, on November 10 described the Center's use of an adoption-diffusion model to organize its work. Substantial research is put into understanding the values and behavior of customers, and what products sell well and why. Homebuilders recognize that in their highly-competitive market with thousands of small companies, federally-sponsored research is a necessity. Individual companies lack the resources or incentives to support research on their own.

NAHBRC works on programs such as Zero-Energy Homes for the Department of Energy, where it is recognized that government subsidies or tax incentives are needed to induce homebuyers to install expensive energy-efficiency or renewables such as solar or wind power that lack a short-term payback. The expectation is that, over time, costs of new technologies will fall dramatically as demand increases. In New York City, for example, green building costs fell from 20% to only 2–5% above conventional costs in just five years.

## New Ways of Thinking About Public Education and Outreach

The case studies and discussions of the CAWT workshops suggest the following themes about public education and outreach, many of which are reflected in policy and literature in the broader water/wastewater infrastructure and other fields:

### **1 Exploring the multiple benefits of an integrated water resource infrastructure paradigm—enhancing the “value proposition”**

A key theme in the workshops was the concept that water and wastewater infrastructure should be integrated into a much larger framework of public benefits to communities, including:

- ◆ Creation of green space
- ◆ Energy savings or production
- ◆ Facilitation of Smart Growth developments
- ◆ Improvements in air quality and public health
- ◆ Increase in neighborhood property values
- ◆ Ecosystem restoration

This concept is at the heart of new initiatives in the water/wastewater sector that go by the names of “Cities of the Future” and “Blue Water in Green Cities.” Cities such as London, Singapore, and Sydney are attempting to expand the objectives and mission of the water sector in these and other ways. Similarly, customers for appliances or new homes generally look for quality construction, green space, energy savings, and aesthetics. Jones's and Johnston's presentations suggested that the values of communities and individual homeowners will vary in this regard.

## **2 Focusing on early adopters and champions rather than the general public and mainstream institutions**

A key theme of the workshops was the role that early adopters and champions played in jump-starting the development and diffusion of decentralized approaches in the water/wastewater sector. Hilary Brown of New Civic Works outlined in a 2005 Harvard University conference on urban green water infrastructure how a classic private market adoption-diffusion curve, which tracks market penetration from a small niche to widespread use, could be influenced through public action (Brown 2005). In this talk, she described how government could transform a sector through the following sequence of policies and initiatives:

- ◆ Financing of laboratory research
- ◆ Building of pilot and demonstration projects in public facilities or subsidized private facilities
- ◆ Financial and other incentives
- ◆ Regulations

This model was followed in the last five years with city and EPA support for green building pilots in New York City (EPA 2005). A green building ordinance for large commercial buildings was adopted last fall, and the city has begun to turn its attention to wastewater recycling in housing projects in Battery Park. The city is exploring incentives, such as lower sewer rates when such recycling occurs.

Clayton Christensen at the Harvard Business School has also described how even the best companies with high-quality products and good customer ratings can be blind-sided by upstarts from other countries (Christensen 1997). “Disruptive” innovations, or paradigm shifts, are started by entrepreneurs outside the established field.

Malcolm Gladwell, in his widely-read book, *The Tipping Point*, argues that in a complex and open society there are key individuals who, by virtue of their networks and leadership roles, can transform markets (Gladwell 2000). This concept was discussed at a 2005 Palo Alto conference on long-term management of soft path infrastructure, where it was agreed that educating a broad range of market participants was probably less effective than reaching a few key leaders in the field (Nelson 2006).

## **3 Working more with “mediating institutions,” including NGOs and other non-traditional businesses and professions, such as environmental and community groups, architects, builders, and others outside the mainstream water field**

The Green Building field was presented as an example of how a consortium of stakeholders could work together to develop innovation outside of and at the edges of mainstream practice in the building sector. Similarly, Haglund’s and Wiland’s presentations demonstrated the value in working with local NGOs in both urban and rural areas to advance more sustainable solutions.

Evidence that such a consensus-building effort might succeed could be seen in Green Building collaboration of architects, business, and environmentalists, in a new alliance of progressive farmers and fiscal conservatives taking on farm subsidies, and the Apollo Alliance of unions and environmental groups urging a range of sustainable energy initiatives.

#### **4 Respecting the public's attitudes about their private property and personal choices and revising management recommendations to reflect those values**

The particular concerns of homeowners were articulated in the Palo Alto workshop. These skeptical attitudes about government regulation and mandates, and opposition to municipal agencies on their private property have been seen in other sectors, including auto inspections, electrical inspections in homes, and others. Eventually, government mandates inspections, but markets emerge where the private citizen can choose their own private company.

#### **5 Developing non-regulatory approaches, such as social marketing and incentives**

The approach of voluntary incentives that Haglund described as being at the core of Aldo Leopold's work on private land ethics is at the heart of the current federal approach to environmental issues. The themes of private stewardship and local control are being implemented in a variety of programs across federal departments and agencies. As such, they serve as the backdrop for the EPA's national innovation strategy, (EPA 2004) the Department of Interior's Water 2025, (U.S. Department of Interior 2003) and the administration-wide support for "cooperative conservation" partnerships (U.S. Department of Interior 2005)

## Chapter 3

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