

A Strategic Assessment of the Future of Water Utilities

Robert C. RENNER
Executive Director
AwwaRF

1. Introduction

In order to characterize and respond to future trends, the Awwa Research Foundation (AwwaRF) funded a project entitled, “An Update to the Strategic Assessment of the Future of Water Utilities” in 2004. Efforts focused on the development of Future Trend Papers, future trends grouped into plausible scenarios and the development of future strategies. The project included assembling a group of water utility leaders at a futures workshop.

At the workshop, utility leaders reviewed trend papers, heard futurists, debated over water utility trends, and identified and ranked approximately 19 trends in terms of certainty and desirability. These trends were then grouped into several potential future scenarios.

The expert workshop was designed to gather the wisdom and expertise of the participants by conducting thorough breakout group discussions. The workshop included 35 water professionals from across the U.S. and 6 project team members from McGuire Environmental Consultants, Inc., the principal investigator for the project. The primary objective of the workshop was to develop, through in depth discussions, ten top future trends and formulate strategies to deal with each trend.

2. Top Trends

The top ten trends that were identified are listed below. A summary of each trends potential implications, as well as potential coping strategies, are described in the report.

1. Energy
2. Drinking Water Industry Employment and Workforce Issues
3. Political Environment
4. Regulatory Trends
5. Population and Demographic Trends
6. Total Water Management

7. Customer Expectations
8. Information Technology
9. Utility Finances
- 10, Information Security

A Strategic Assessment of the Future of Water Utilities



Rob Renner

Awwa Research Foundation



AwwaRF

Mission: Advance the science of water to improve the quality of life

- **Centralized research program for drinking water utilities**
 - Sponsor research
 - Develop knowledge
 - Promote collaboration
- **Agenda is planned and guided by drinking water utilities**
- **Research covers a broad range of topics including source water, treatment, infrastructure, and management for drinking water utilities**

A Strategic Assessment of the Future of Water Utilities Top Ten Trends

1. **Population**
2. **Political Environment**
3. **Financial Constraints**
4. **Total Water Management**
5. **Customer Expectations**
6. **Workforce Issues**
7. **Technology**
8. **Energy**
9. **Increasing Risk**
10. **Regulations**

Population Growth

U.S. population steady increase over the past 40 years

Expected to maintain that rate into the next century with the South & West experiencing greatest growth.

Strategies address this trend:

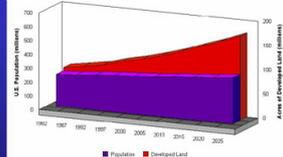
- Integrated resources planning using scenarios & contingencies.
- Become involved in watersheds.
- Communicate with consumers.
- Stake out position on development?

Population: Regional Growth

Demographic Changes: Population Has Grown Fastest in the West, Particularly in the "Public Land States"



Rate of Land Development vs. Rate of Population Growth



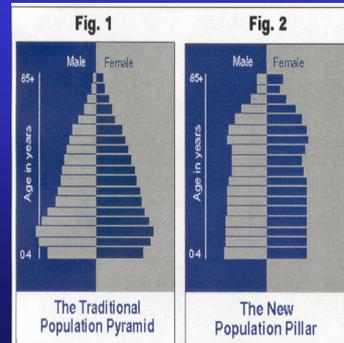
It's how and where we are growing that are driving our significantly increasing rate of land consumption, not domestic population growth.

U.S. Population Projections

2000 – 282,125,000

2030 – 363,584,000b

Population: New Demographics



- Globally, # of persons >60 yrs is ~600M in 1999, and projects to ~2B by 2050.
- The # of older persons will be larger than the # of children (0-14) for the first time.
- People are now living 20 years longer

Source: DA Agreer, June 1999

Political Environment

The political environment is grows complex. There is a surge in NGOs that will play a greater role in public policy decisions. Public participation will play a larger role. Term limits in many communities require greater outreach.

Strategies to address this trend:

- Develop & maintain state of the art communications.
- Documentation of financial & capital improvement plans to improve transparency.
- Develop communicators & processes
- Leverage NGOs & relationships

Finance: Utility Constraints



The challenges of replacing and repairing infrastructure will strain many systems. Doubling to tripling of rates over next 20 yrs. Rising rates will require "cost-containment". Labor unrest potential.

Strategies to address this trend:

- Documentation of infrastructure & rate needs.
- Communication to stakeholders.
- Optimize utility efficiency.

Total Water Management

Water utilities will need to increasingly consider broader policy impacts on their water sources.

Strategies to address this trend:

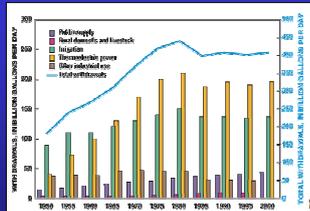
- Documentation of infrastructure & rate needs.
- Communication to stakeholders.
- Optimize utility efficiency.

Total Water Management: Global Warming - Intergovernmental Panel on Climate Change

- Projects global temp increase from 1.4 - 5.8° C from 1990-2100.
- Widely varying regional responses,
- Precipitation expected to increase in N. mid-high latitudes
- Glaciers/ice-caps continue to retreat.
- 3° C melts the 1.8 mile thick Greenland Ice Cap raising - oceans rise by average 7 meters w/in 1000 years (Nature, 2004).



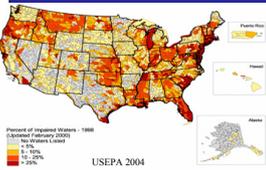
Total Water Management : Water Use Trends by Category, 1950-2000



Source: USGS, March 2004

Impairment is widespread

Public water use is increasing



Given current trends in development patterns, we will be unable to meet the goals of the Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA) with our traditional water programs alone.

Total Water Management: Alternative Water Sources

Expansion of alternative supply use:

- Desalting
- Recycling
- Conjunctive Use
- Conservation

- Use of "marginal" supplies (cost & quality) growing
- Membrane costs dropping & energy efficiency improving
- Real & perceived quality issues
- Water/Growth: chicken or egg?
- 1950 seawater desalting US\$4/kL; now ~US\$0.65/kL
- Residuals disposal issues grow

Customer Expectations

Customer service can be improved. Understanding customer needs, desires, and best methods of communication will help ensure there is never a disconnect between the customer and the utility.

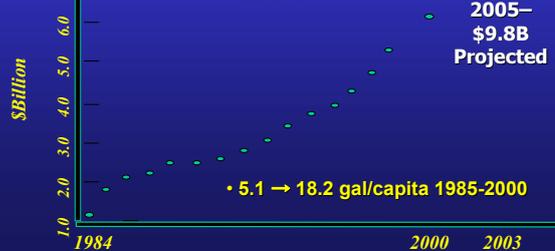
Strategies to address this trend:

- Use state-of-the-art outreach methods to understand & frame interactions
- Provide governing bodies consumer info

Customer Expectations

Bottled Water Sales Figures per Beverage Marketing Corp.

Bottled water sales have risen about 8.0% per year since 1993



Workforce Issues

There are significant changes occurring in the workforce including retirement, education, increased technology, conflicting generational values, ethnicity and gender.

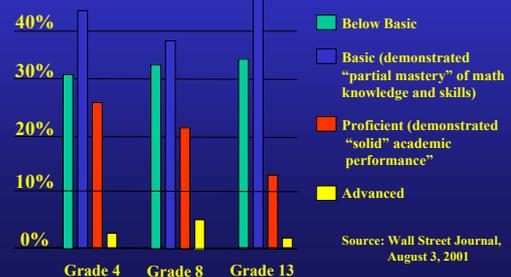
Strategies to address this trend:

- Understand generational & workforce differences & needs of employees.
- Provide workforce flexibility.
- Conduct more training programs.
- Develop apprenticeship programs.

Workforce Issues: Education Levels

Achievement on the Natl. Assessment of Educational Progress 2000 Math Exam

Only 19% of 12th graders scored high enough to be considered "proficient" or better.



Source: Wall Street Journal, August 3, 2001

Workforce Issues: The Brain Drain

More than 40% of U.S. labor Force will reach retirement age by the end of this decade.

More than half of electric utility Workers will be eligible w/in 5 yrs

of workers between 35 and 44 is expected to shrink by 7%



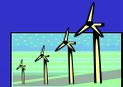
Technology

Technology is rapidly evolving. Its becoming smaller, cheaper and disposable. This trend will continue. On-line monitoring will become the norm.

Drinking Water Treatment Technologies

- Multiple drivers pushing new treatment techs.
 - Need to seek additional source water.
 - Impaired/degraded sources
 - Increased demand
 - New/future SDWA regulations.
 - Emerging contaminants.
 - Consumer demands.
- Major residuals handling issues loom

Energy



Energy and reliability will become a major issue for utilities. Petroleum based energy will give way to other forms within 20-40 years. Alternative fuels will become the norm.

Strategies to address this trend:

- Develop an energy plan for each utility.
- Aggressive energy conservation.
- Assess backup energy needs & availability.

Increasing Risk Profile



Utility risk issues (e.g. IT, physical security, and litigation) are increasing.

Strategies to address this trend:

- Assess internal capability and needs.
- Outsource functions where appropriate.
- Develop specific risk management policies.

Regulations

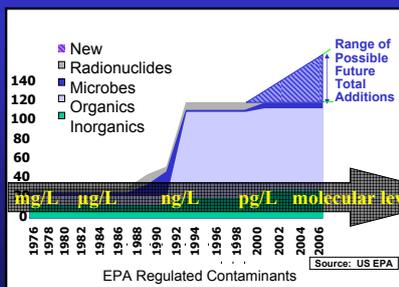


Regulations will continue to challenge water utilities. These regulations will impart fear in the public and are likely to increase sales of bottled water and POU devices.

Strategies to address this trend:

- Develop clear compliance cost info for stakeholders.
- Early engagement in regulatory/legislative process.
- Understand where public stands on issues.
- Fund and develop alternative regulatory paradigm.

Technology: Drinking Water Regs



- Stage 2 DBPR
- LT2ESWTR
- Distribution Rule?
- On-line Monitoring

The End
Thank You

