Systems for Potable Water in the Rural United States: Building and Maintaining Capacity through Technical Assistance Networks

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Why Worry About Rural Communities and Water in the US

- US citizens generally have access to some of the world's best quality and most affordable water and sanitation.
- According to both US and UN international statistics, the 100% of the population in the US has water and sanitation.
  - Even in rural areas.
- The US is one of the richest nations in the world
  - (But it is also the world's largest debtor nation!)
- The US has ample water supply and incidence of waterborne disease concomitant with these statistics.

Beware of Statistics and Perceptions

- Low-income, rural communities often have greater challenges in accessing safe and affordable water and sanitation
- While statistically insignificant, 1.8 million still live without access to complete plumbing,
  - the largest percentage of the are in rural areas, .
- Rural communities face issues of: financing, technical knowledge, management capacity, and organization
  - Gap of $1.5 billion
- These problems are likely to reoccur as conditions change and new problems arise

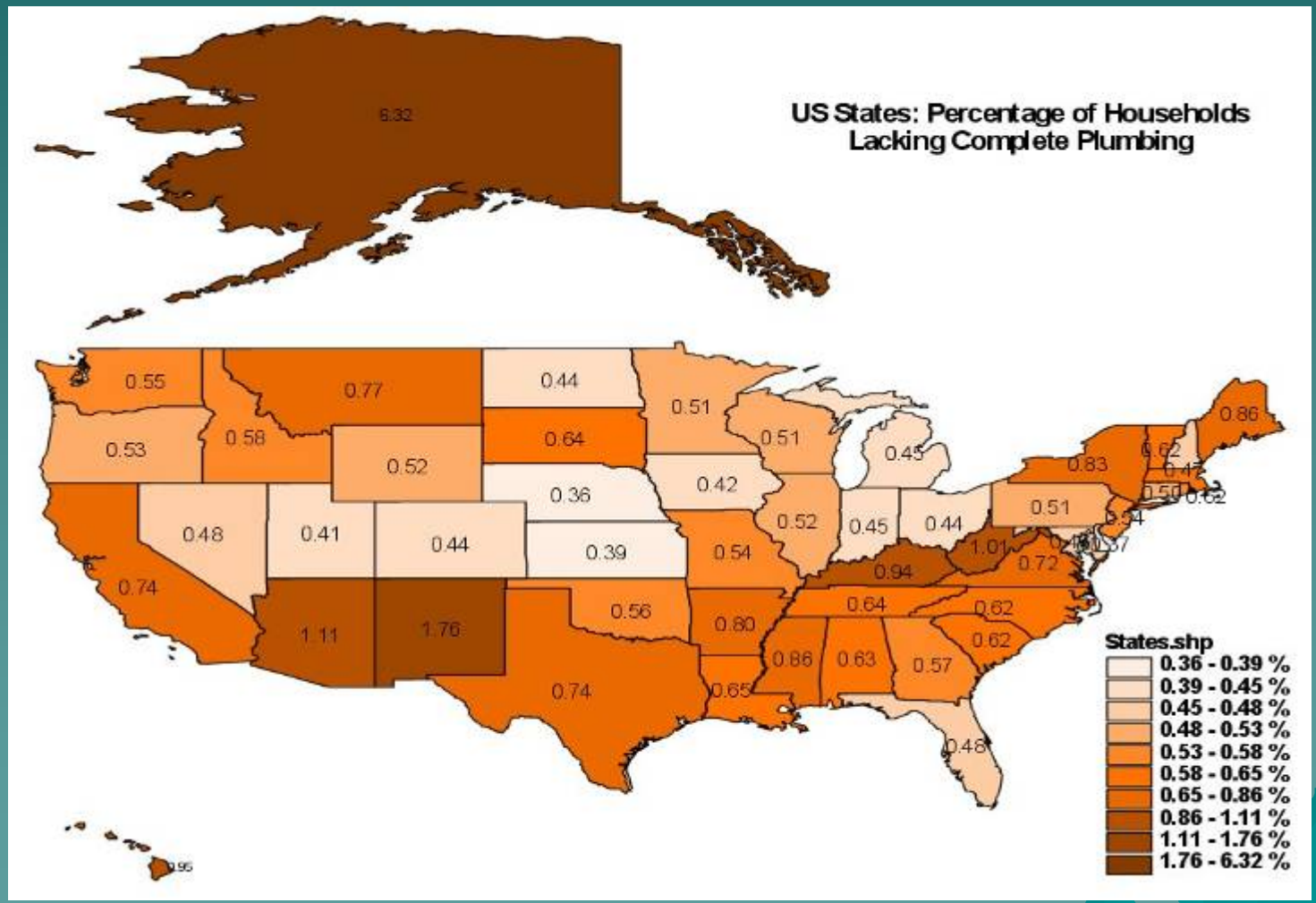
Current US Situation

Households Lacking complete plumbing facilities

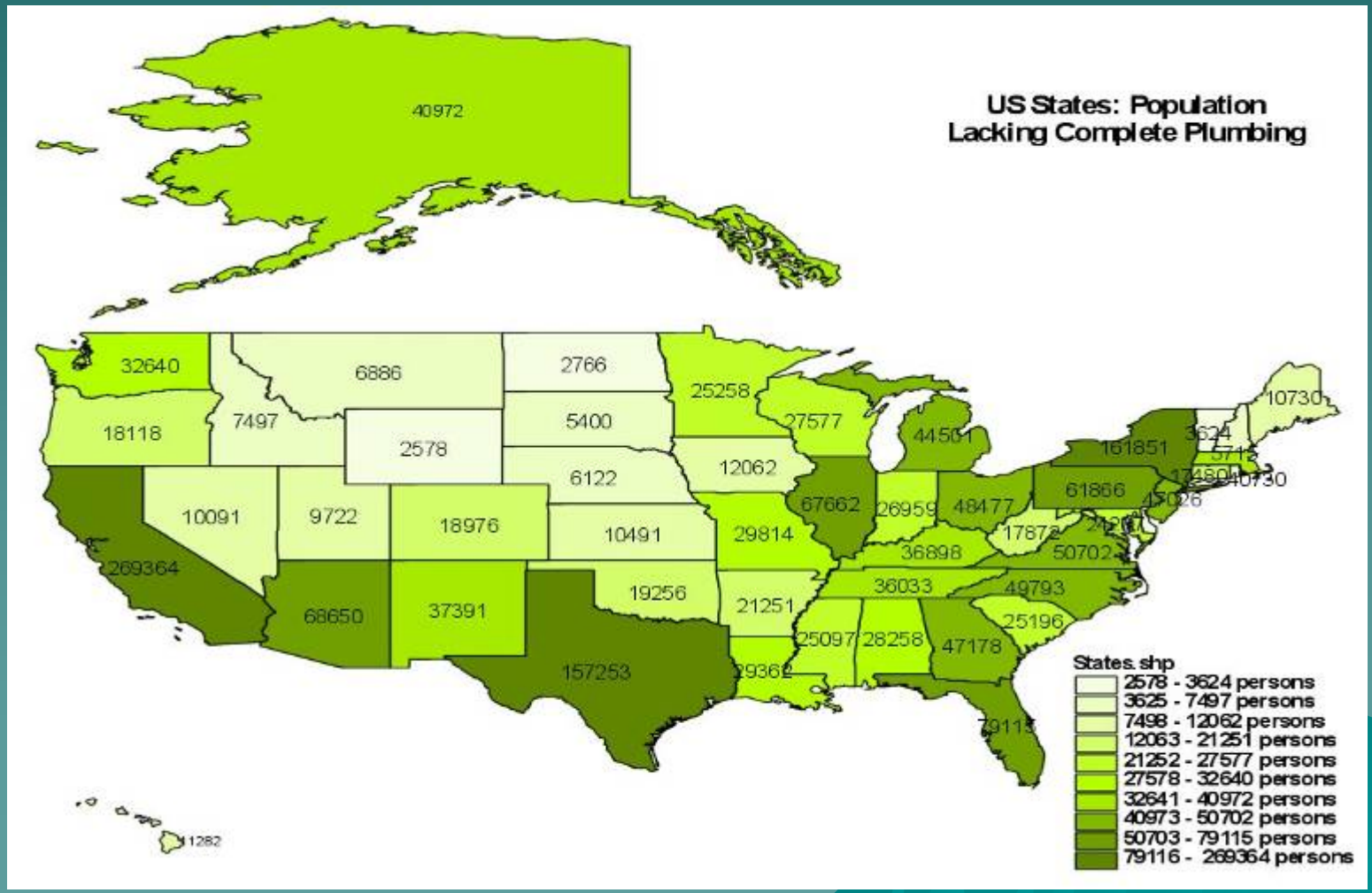
US / State / Territory	Total OHU lacking complete plumbing facilities (2000)	Percent of OHU lacking complete plumbing facilities (2000)	Total OHU lacking complete plumbing facilities (1990)	Percent of OHU lacking complete plumbing facilities (1990)	Percent change in total OHU lacking complete plumbing facilities, from 1990 to 2000 (base year = 1990)	Percent change in total OHU from 1990 to 2000 (base year = 1990)
United States	670986	0.64	721693	0.78	-7.03	14.72

Geography	Occupied Housing Units Lacking Plumbing Facilities		
	Total	Percentage (as % of total Households)	Estimated Population Lacking Plumbing
United States	670,986	**0.64**	1,737,814
U.S. – Rural	226,967	**1.03**	599,193
U.S. – Rural – in a place	41,704	**0.84**	105,511
Rural – in a place of 2500 or more people	9,156	**0.61**	23,897
Rural – in a place of 1000 to 2500 people	13,288	**0.68**	33,087
Rural – in a place of less than 1000 people	19,260	**1.27**	48,150
Rural – not in a place	185,263	**1.09**	496,505
Rural – farm	13,172	**1.19**	35,564

Distribution of those lacking complete plumbing facilities



Population Lacking Complete Plumbing Facilities, US



States Ranked by Total OHU Lacking Complete Plumbing Facilities (2000)

US / State / Territory	Total OHU lacking complete plumbing facilities (2000)	Percent of OHU lacking complete plumbing facilities (2000)	Total OHU lacking complete plumbing facilities (1990)	Percent of OHU lacking complete plumbing facilities (1990)	Percent change in total OHU lacking complete plumbing facilities, from 1990 to 2000 (base year = 1990)	Percen t change in total OHU from 1990 to 2000 (base year = 1990)
United States	670986	0.64	721693	0.78	-7.03	14.72
California	85460	0.74	57974	0.56	47.41	10.80
Puerto Rico	65640	5.20	NA	NA	NA	NA
New York	58418	0.83	50428	0.76	15.84	6.29
Texas	54853	0.74	568 44	0.94	-3.50	21.78
Florida	30134	0.48	22061	0.43	36.59	23.43
Pennsylvania	24450	0.51	26355	0.59	-7.23	6.25
Illinois	23959	0.52	21572	0.51	11.07	9.27
Arizona	21088	1.11	18352	1.34	14.91	38.90
Virginia	19550	0.72	35788	1.56	-45.37	17.77
Ohio	19407	0.44	24394	0.60	-20.44	8.76
North Carolina	19295	0.62	33192	1.32	-41.87	24.43
Georgia	17117	0.57	22921	0.97	-25.32	27.03

Beyond Access: New Challenges

- Infrastructure Obsolescence
- Increasing Treatment Burden
- The cost of safe water
- Scope:
  - 54,000 community water systems –
  - 85% in small communities serving less than 3,300 connections
  - 45% are located more than seven miles from a community of more than 3,300 connections

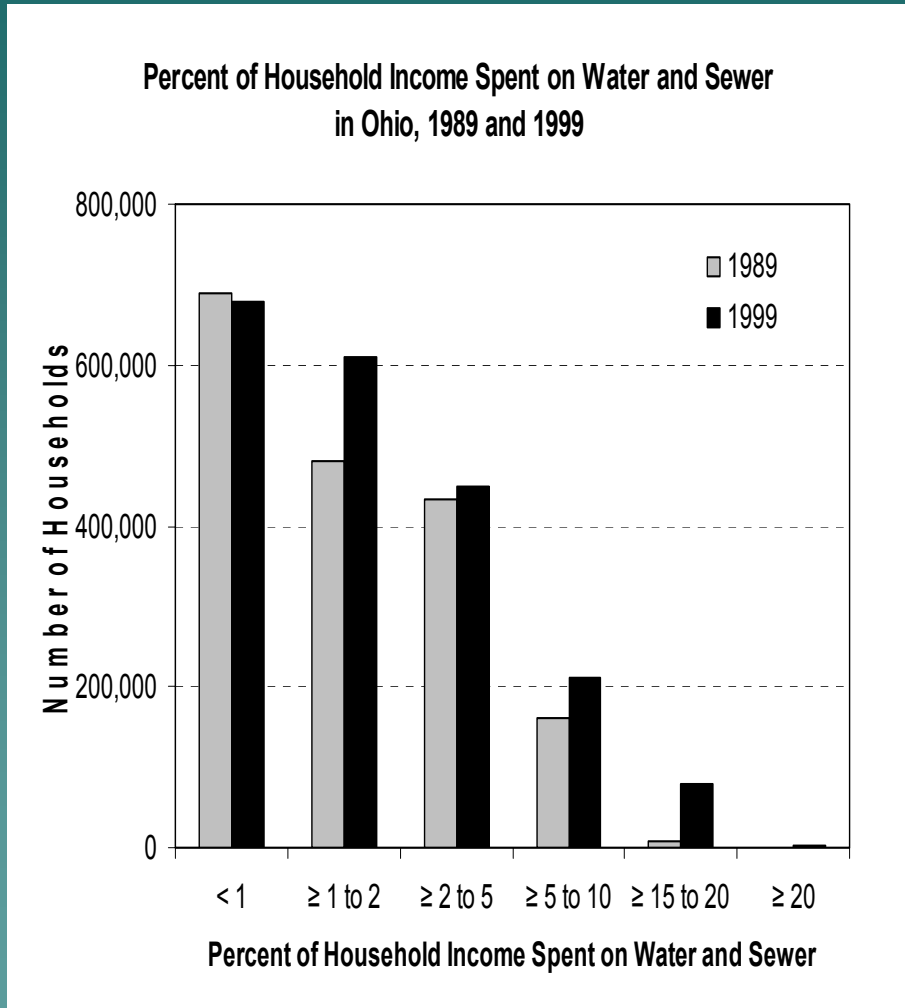
Infrastructure Depreciation

What is the Gap?

- While this crisis is looming regarding water infrastructure, the funding streams that implemented much of the infrastructure in the last century are below current and predicted needs.
- EPA estimates (2000 to 2019) capital needs for **clean water** range from **$331 billion to $450 billion** point est. **$388 billion**.
- Capital needs for **drinking water** ('00-'19) range from **$154 billion to $446 billion** with a point estimate of **$274 billion**.

The Cost of Water is Rising

- CBO estimates that water and sewer bills average between 0.5 and 1 percent of household income.
- Data from the 2000 census show that the annual cost in 1999 averaged $476 per year for w/ww.
- Just less than half (11.4 million) of households with incomes under $20,000 per year paid a water or wastewater bill in 1999.



US Water Availability in Historical Perspective

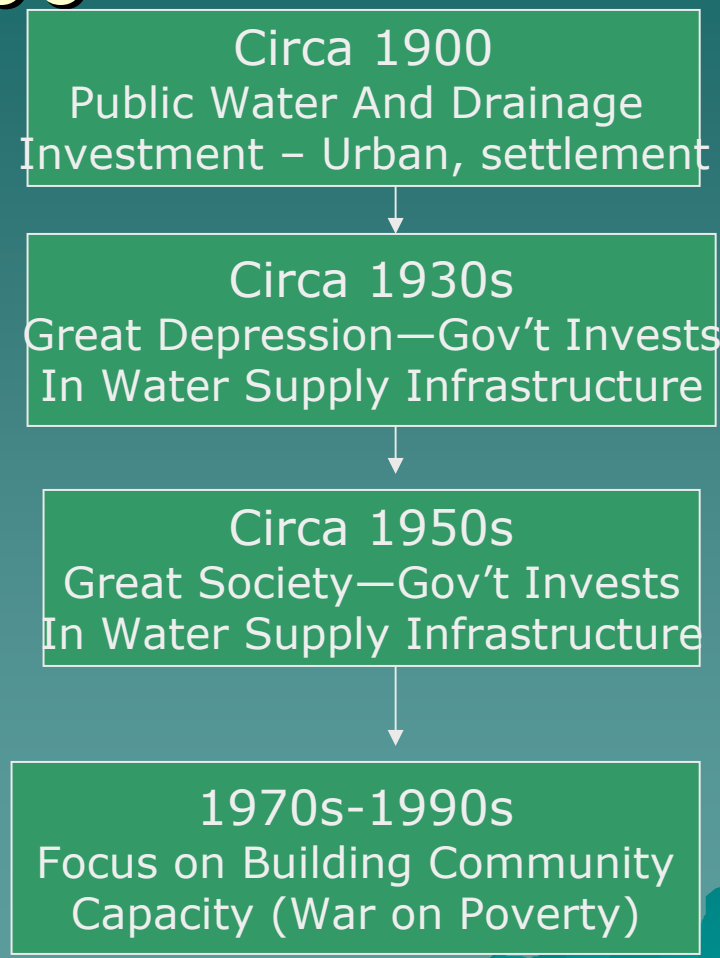
% of occupied housing units lacking plumbing (U.S.)	1950	1960	1970	1980	1990	2000
Rural	56	31.5	14.5	4.5	1.9	1.0
Rural – farm	55	NA	NA	3.9	NA	1.2
Urban	11	8.2	3.1	2.2	0.5	0.5
Total	**27**	**14.7**	**5.9**	**2.7**	**0.78**	**0.64**

Questions from these statistics

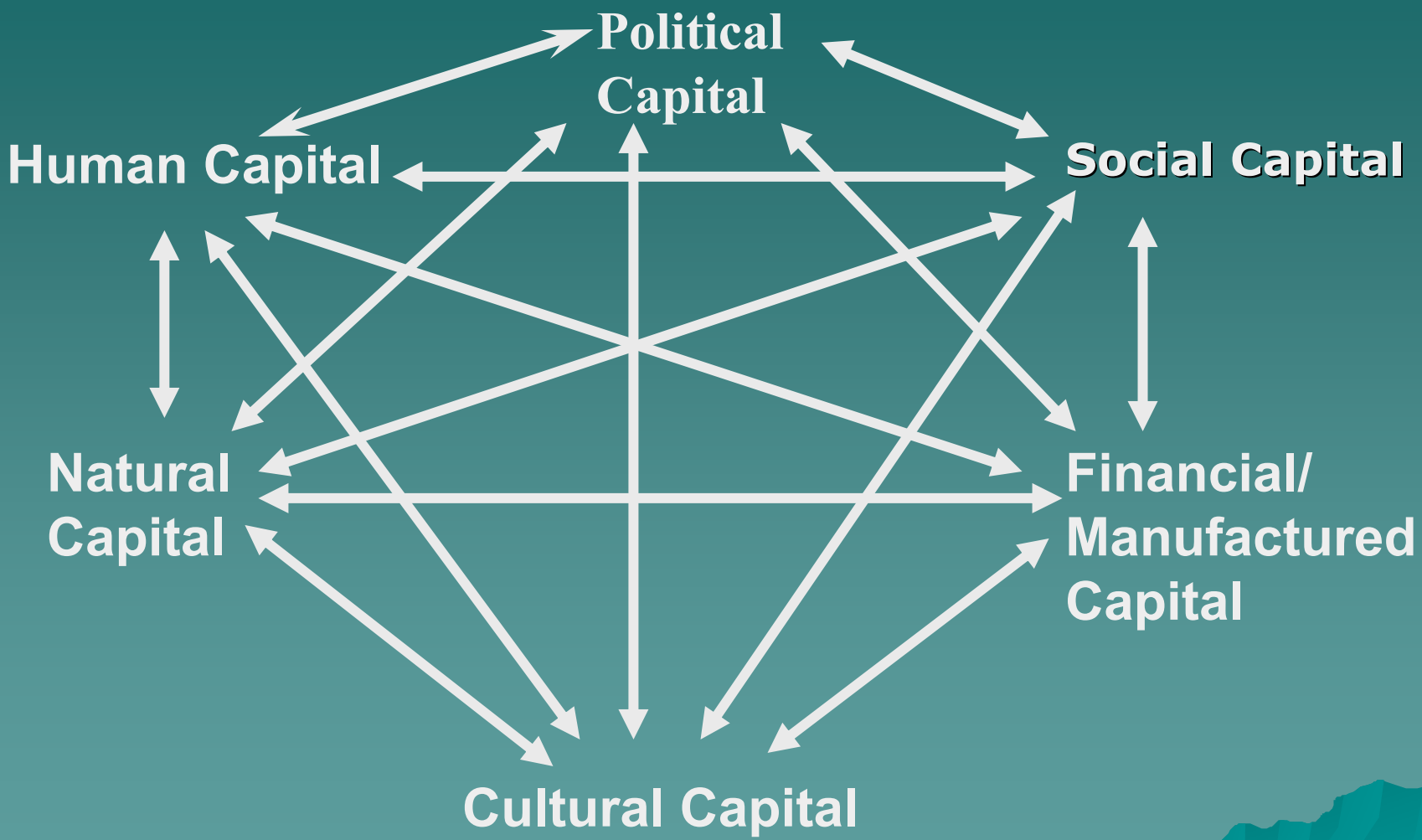
- There are clearly still issues and populations in need of better access to water and sanitation.
- US has made significant progress from 1950 to present in improving access.
- The question is **what were the systems that facilitated this progress?**

Improving US Water Supply 1950-2000

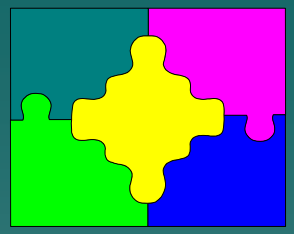
- Despite significant public water infrastructure investment in the US came post WWII (1950-1970)—
- By 1970 there were still communities systematically excluded from water services.
- Given systemic constraints on delivery of services and dollars to disadvantaged communities, 1970-1990 saw the development and expansion of a social infrastructure to create community capacity to access financial and technical assistance to implement water and sanitation systems.



Community capacity may be defined as capitals: what happens with one capital can enhance or reduce others

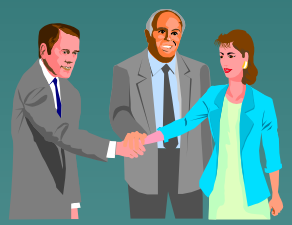


Modeling



Desired community Future

Advocacy Coalition



Citizen Advisory Group

Points of agreement

Economic

Natural

Social

Indicators

Water quality and quantity—relation to social and economic goals

Outcomes

Activities

Role of the intermediary

- In response to an observed problem with access to safe drinking water in the 1970s, Congress appropriated funds for technical assistance (TA) services to assist rural communities with infrastructure development
- Congress also allowed for the allocation of funds to Non Governmental Organization (NGO) TA providers to work with communities on organizing community capacity for water infrastructure development and management.

NGO Technical Assistance Providers

Self-Determination for Rural Communities:

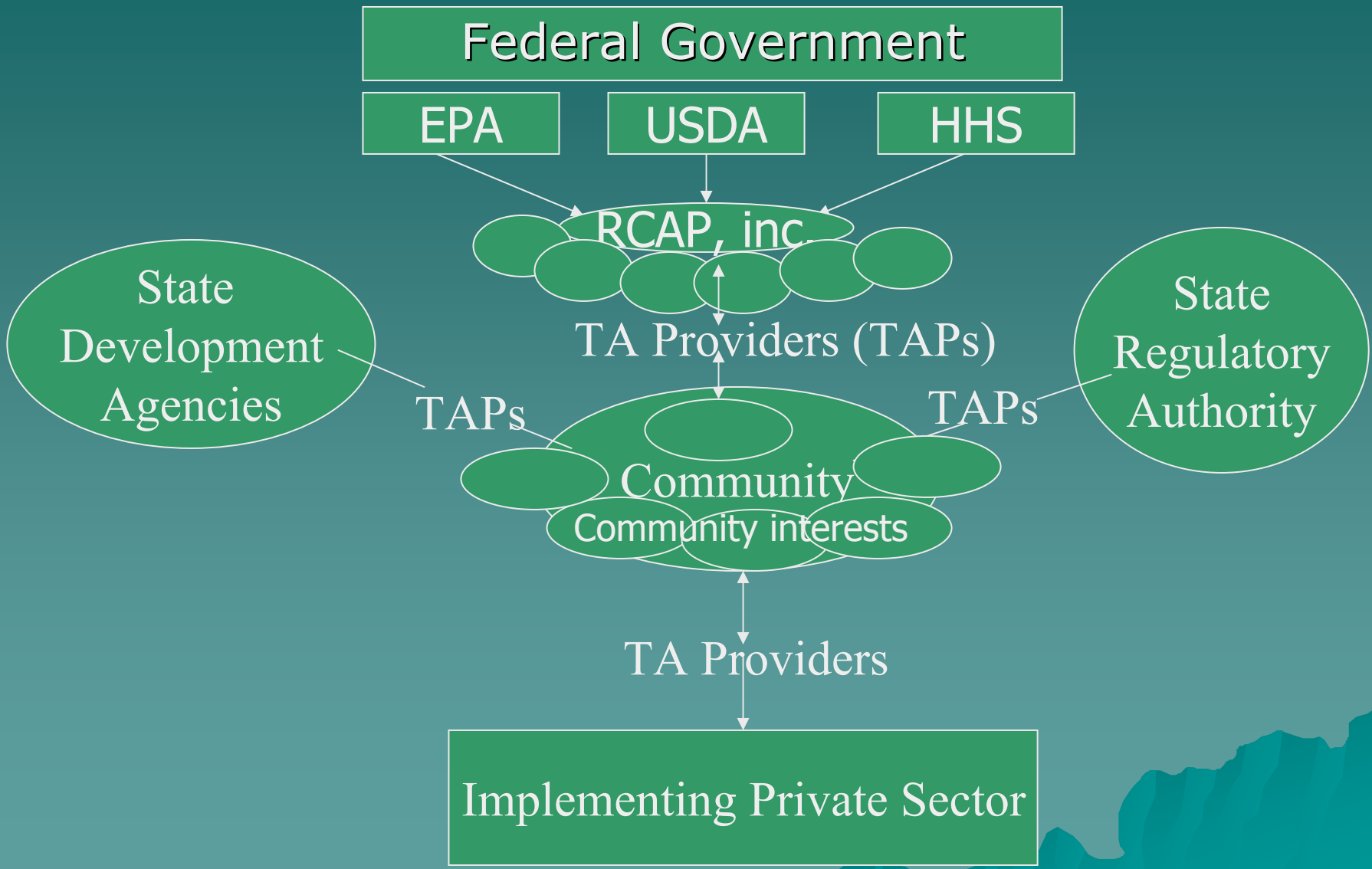
Capacity Building for Economic Revitalization

Empowering Communities through providing access to government, and networks to other NGOs, government agencies, communities

Provide technical assistance to rural communities:

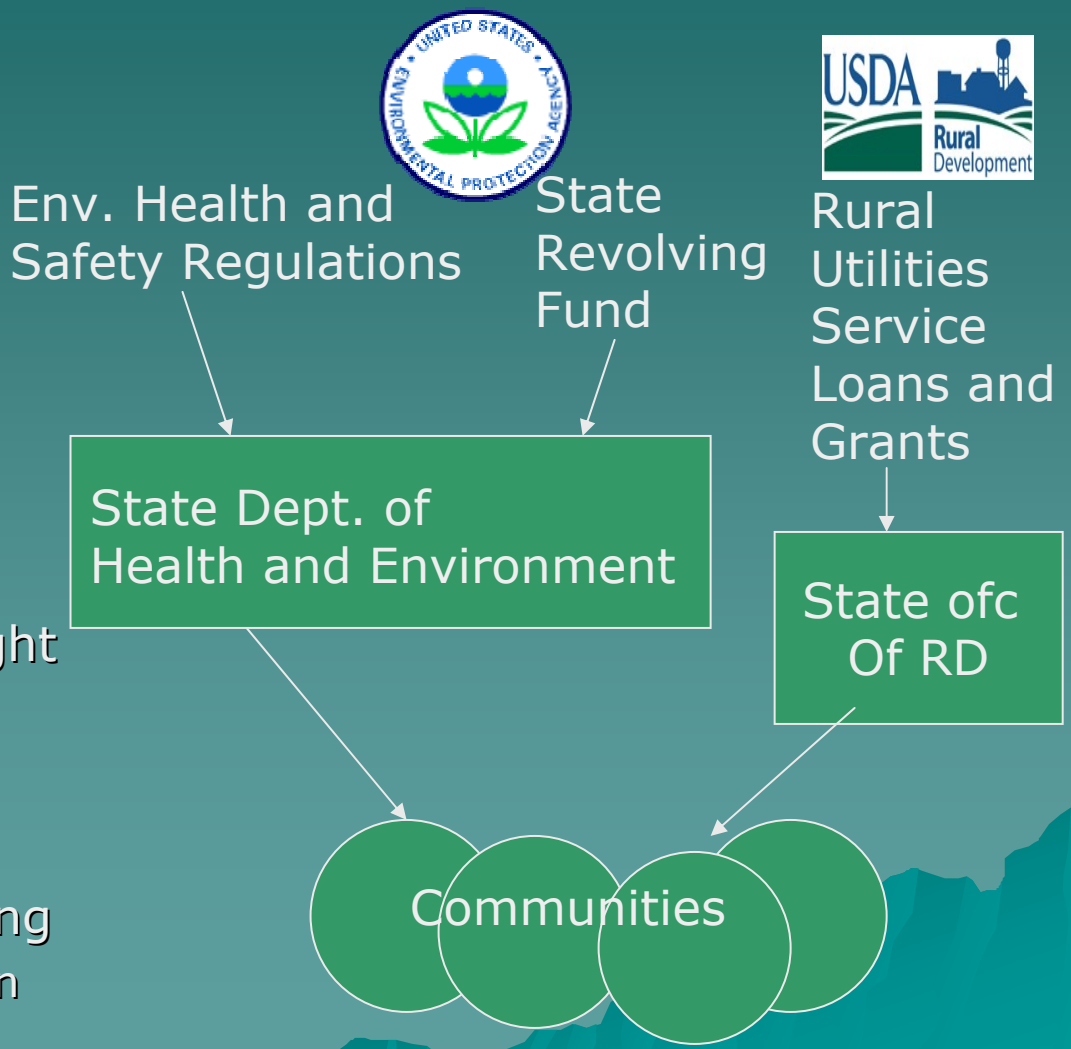
- Facilitation for infrastructure development opportunities
- Assistance in preparation of proposals, plans, and grants/loans
- Assistance in selection of technology/contractors
- Networking to provide political capital
- Advice on water rights and responsibilities

A Facilitating Role



Role of the Federal Government

- Multiple Federal Agencies
  - EPA
    - Environmental Regulation
    - Financing
  - USDA
    - Financing
    - Engineering oversight
  - Other agencies
    - Human services—support TA
    - Commerce & Housing
      - Financing for econ development



Financing Water and Sanitation

- Rural community water systems receive financing through
  - Federal Sources
  - State Financing Authority

USDA Rural Development

CDBG EDA

IFA ILLINOIS FINANCE AUTHORITY

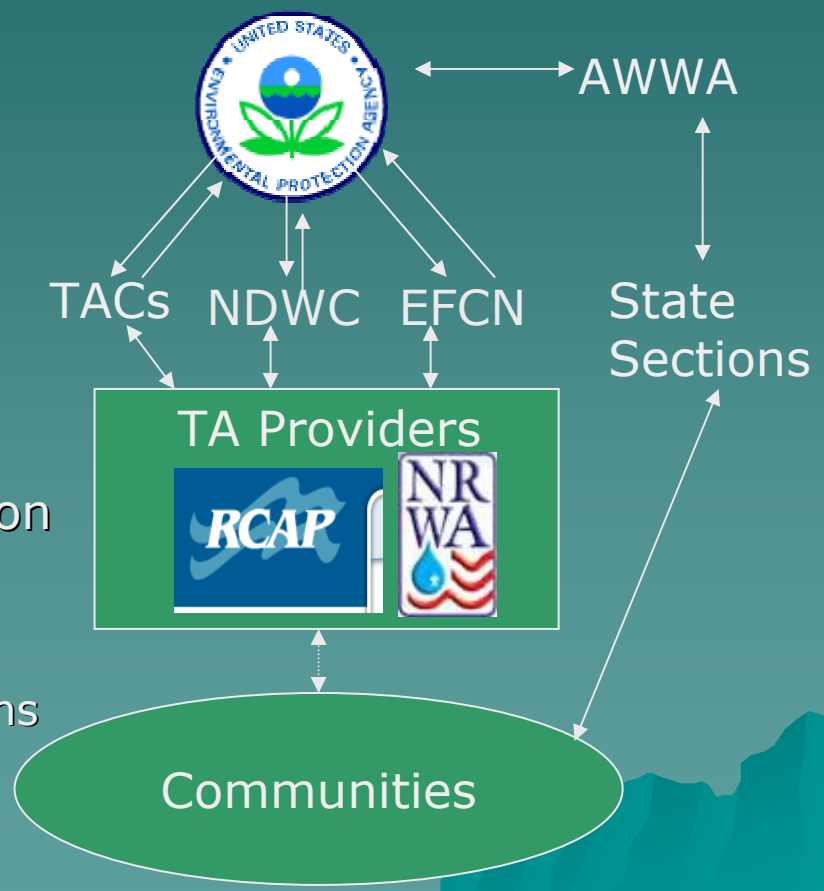
Community Bonding

TA Providers

- There are two TA providers
- National Rural Water Association
  - State Agencies
    - Membership Base
    - 24,000 utility members
  - Circuit Riders
  - Source Water Planning
- RCAP
  - Serves 2,000+ communities per year
  - Rural Government
  - Non-membership
  - Community Planning

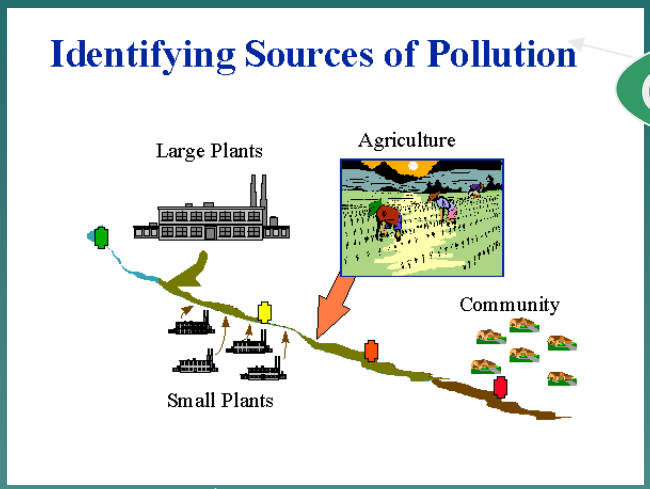
Knowledge Creation and Information

- Technical Assistance Centers
  - University based
  - Regional Applied Science
- National Drinking Water Clearinghouse
  - National Center WVU
  - Data Clearinghouse
- Environmental Finance Centers
  - University based
    - Information on financing and governance
- American Water Works Association
  - Membership based
  - Development of Technical Information
  - Distributed through State Sections
  - Explicitly involved in advocacy

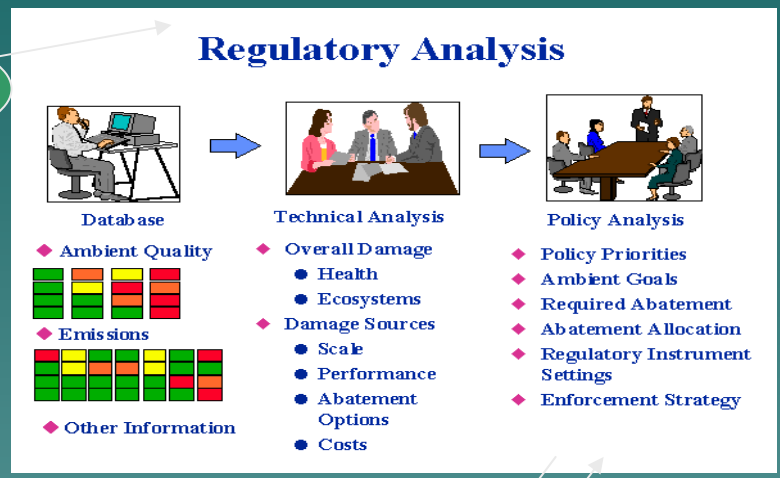


Intermediaries and Standards

Civil Society and Intermediary organizations are key to the U.S. Regulatory System



Civil Society



DATA

Intermediary Organizations

Intermediary Organizations

Civil Society

Taylorville-Macon County Aquifer

- Major threats from feed lots, septic systems, above ground storage tanks, underground storage tanks, livestock waste treatment facilities, treated wood/lumber yards, wells (such as irrigation wells), and lagoons.
- Worked with the local Natural Resources Conservation Service and Soil & Water Conservation Service to promote the United States Department of Agriculture's Conservation Reserve Program.
- Created educational outreach brochures for distribution to those who live and work within the communities' recharge areas. – Utilized disaster management moneys to covers well in GIS system as part of tracking SW threats. Important in sharing blame and moving to solutions.
- Included BMPs for farmers and landowners—but also planning, ordinances and policies.

Case Study: Whitley County, KY

- Community suffered from significant water quality contamination form mine drainage and seepage.

- Local organization happened through local political leadership change→work with KY RCAP and others → a county wide water system.

International Implications

There are Positives and Negatives About the US TA System

- Positives
- The US TA system provides important resources to communities
- Helping to build
  - Technical expertise (human capital)
  - Financial Resources
  - Capacity to access resources (social and political capital)
  - Improving water (natural capital)

- Negatives
  - Communities are not as aware of these resources as they should be …
  - Financing for the system has been politicized
  - Decreasing grant dollars through programs
  - Increasing special allocations through legislature
  - Competition leads to self serving advocacy
  - Political process leads attention to special issues
    - Example: Security

International Implications
Applications to Developing Countries

- Comparison to Education role of Les Animateurs Rurale;
- International Rural Water Circuit Rider Initiative
  - Have currently provided assistance in more than 400 communities in Honduras and El Salvador

Conclusion

- The US TA model provides is worth consideration…
- Questions about:
  - Financing TA providers
  - Connection to data and knowledge
  - Connection to financial resources
  - Role in the political process
- Importance of considering context…
  - May work best in the context of a federal system