Better Water Governance: Evidence-Based Decision Making for Practitioners and Policymakers

June 27, 2019
Governance refers to the political, social, economic, and administrative systems in place that influence water and sanitation use and management.
“USAID will support the development and implementation of governance systems grounded in evidence, and which provide a sound framework for providing safe drinking water and sanitation services and water resources management at all levels.”

Development Result 1: Strengthen Sector Governance and Financing
Agenda

Data Droughts and Data Floods: Assessing and Optimizing the Value of Data for Water Governance
Presented by: George Van Houtven and Katie van Werkhoven

Why Evidence Matters to Water Sector Governance: Data, Context, and Calibration for Resources Management and WASH Service Delivery
Presented by: Barbara Rossmiller and Dennis Mwanza

Q&A
Data Droughts and Data Floods: Assessing and Optimizing the Value of Data for Water Governance

George Van Houtven, PhD
Senior Environmental Economist
RTI Center for Water Resources

Katie van Werkhoven, PhD
Senior Water Resources Engineer
RTI Center for Water Resources
Data is Essential for Effective Water Governance at All Levels

Governance Activities

**SHORT TERM**
- Day-to-day operations and communication

**MEDIUM TERM**
- Monitoring and compliance
- Issuing permits
- Project implementation
- Organizing and capacity building

**LONG TERM**
- Water management planning
- Development of laws and policies
- Research and innovation
Data is Essential for Effective Water Governance at All Levels

Examples of Data Requirements

- **SHORT TERM**
  - Weather and flood forecasting

- **MEDIUM TERM**
  - Stream flow monitoring, water metering
  - Sectoral water use data
  - Seasonal stream flow forecast
  - Public knowledge polling

- **LONG TERM**
  - Climate forecasts and population projections
  - Trends in water service access and interruptions
  - Remote sensing of evapotranspiration
Data Development for Water Governance Takes Many Forms

MONITORING DATA

MODELED DATA

SURVEY DATA

NATURAL SYSTEMS/WATER SUPPLY
- Hydrological
- Meteorological
- Topography
- Water quality
- Landcover/vegetation

SOCIAL SYSTEMS/WATER DEMAND
- Socio-demographic
- Land use
- Consumption patterns
- Non-consumptive water use
- Water permits/rights/transfers

MONITORING DATA

MODELED DATA

SURVEY DATA

NATURAL SYSTEMS/WATER SUPPLY
- Hydrological
- Meteorological
- Topography
- Water quality
- Landcover/vegetation

SOCIAL SYSTEMS/WATER DEMAND
- Socio-demographic
- Land use
- Consumption patterns
- Non-consumptive water use
- Water permits/rights/transfers

Adapted from Jeuland et al. (2018)
Evaluating Investments in Data and Information Systems

**DATA DROUGHT:** when data are scarce, investments in new data collection efforts must be evaluated

**DATA FLOOD:** when data are (over)abundant, investments in data and information management systems are a higher priority

How does one estimate and compare the return on these types of investments?

- Identify the key decisions and behaviors that will be affected
- Describe in what ways and by how much the decisions will be improved
Value of Information Framework

- **State**: the state of the world that is uncertain for a decision-maker
  - Flood OR no flood

- **Signal**: information about the state of the world, which reduces uncertainty
  - Flood forecast

- **Action**: choice of action by decision-maker, which depends on the signal
  - Evacuation order OR no evacuation order

- **Action Value**: benefit or cost of action (compared to baseline), which depends on the state

<table>
<thead>
<tr>
<th>State</th>
<th>Signal</th>
<th>Action</th>
<th>Action Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No evacuation order and flood occurs</td>
<td>Flood forecast</td>
<td>Evacuation order</td>
<td>cost of evacuation</td>
</tr>
<tr>
<td>No evacuation order and no flood occurs</td>
<td>Flood forecast</td>
<td>Evacuation order</td>
<td>cost of evacuation</td>
</tr>
<tr>
<td>Evacuation order and flood occurs</td>
<td>Flood forecast</td>
<td>EVACUATION</td>
<td>cost of evacuation</td>
</tr>
<tr>
<td>Evacuation order and no flood occurs</td>
<td>Flood forecast</td>
<td>EVACUATION</td>
<td>cost of evacuation</td>
</tr>
</tbody>
</table>
Value of Information Framework

To measure the value of information, one needs to be able to predict:

1. What actions will decision makers take when faced with different signals?

2. What are the values of different actions under different states of the world?
   • What types of losses from ill-informed actions can be avoided?
Translating Data to Value

DATA → INFORMATION → KNOWLEDGE → ACTION → VALUE

- Design Gap
- Expertise Gap
- Leverage Gap
- Execution Gap

Adapted from de Vries (2018)
Examples from RTI Projects
Translating Data to Value – the FloodWarning Example

**Examples:**
- **Design Gap**: Gauge not reporting
- **Expertise Gap**: Unknown inundation thresholds
- **Leverage Gap**: Communication cutoff to remote areas
- **Execution Gap**: Lack of willingness to evacuate
Bangladesh

A geopolitically-induced Design Gap and potential satellite-based solution
Bangladesh

A solution to an Execution Gap that needs to go a step further
El Salvador
Overcoming a fundamental Execution Gap

Rio Lempa Hydrologic Forecast Center 2001

Risk Analysis Center 2012
Translating Data to Value – the Water Security Example

Examples:

- Data follow political boundaries
- Ineffective communication
- No defined protocols for water restrictions
- Lack of incentive to follow protocols
Nile Basin Region

Progress toward overcoming a data drought for water resources management
Optimizing the value of data...

• Finding the critical gaps in the data-to-value process

• Strengthening water governance to overcome those gaps
Why Evidence Matters to Water Sector Governance:
Data, Context, and Calibration for Resources Management and WASH Service Delivery

Barbara Rossmiller
Project Director, USAID E-WASH Program, Nigeria
Director of Programs, Climate, Natural Resources, and Water Learning, Energy & Environment for Development (LEED)
RTI International Development Group (IDG)

Dennis Mwanza
Chief of Party, USAID E-WASH Program, Nigeria
Learning, Energy & Environment for Development (LEED)
RTI International Development Group (IDG)
Why Does It Matter?

**Water governance** is a prerequisite to sustainable water resources management, effective water and sanitation services, and water security.

Water is an essential input to human and economic development.
Evidence-based Decision Making

Fundamental to good governance is the ability to make informed decisions based on evidence.

Evidence comes from a wide variety of sources, must reach a broad array of stakeholders and be used in many different ways.
Who Needs Evidence?

COUNTERPARTS
- Ministries
- Water agencies
- Sub-national government
- Local government
- Donors
- Implementers

SERVICE PROVIDERS
- Utilities
- Water User Associations
- Customers
- Communities
- Regulators
What Kinds of Evidence?

- **Water Quantity information**
  - Groundwater
  - Surface water
  - Rainfall / Snow melt
  - Effluent

- **Water Quality information**
  - Viability of available water supplies for intended use

- **Utility Performance Information**
  - Key performance indicators
  - Customer data
What Kinds of Evidence?

**COMMUNITIES**
- Community Scorecards
- Town Hall meeting
- Regulatory Reports
- Media

**CUSTOMERS**

**DONORS**
- Political Economy Analysis
- Research Reports
- Monitoring & Evaluation

**IMPLEMENTERS**
When Does Information Become “Evidence?”

DEFINITION

“The available body of facts or information indicating whether a belief or proposition is true or valid.”

(Oxford Dictionary)

• Data in isolation or without analysis is information, not evidence

• When information is used for action and corroboration, it becomes evidence - this is the goal in strengthening governance
Evidence-based Decision-making in Action: Practitioners

Examples from:

• Jordan
• Nigeria
Objective: to support operational and management changes in the administrative units that would have a tangible effect on service delivery

Activities:

- Assessment of Critical Operational Needs - *evidence used to determine where to target support* for General Manager and USAID decision-makers
- Operations activities assessed data collection, regular monitoring and reporting on KPIs – to create evidence for utility operators
  - Fully metered production wells (went from 50% to 100%)
  - Established routine monitoring visits and data collection

Operational Performance Improvement Pilot

USAID Institutional Support and Strengthening Program (ISSP)

TAFILEH, JORDAN
Impacts

Well field productions estimates of 1244 m$^3$/hr were actually measured at 826 m$^3$/hr as a result of full metering.

**RESULTED IN:**

New production wells drilled to make up shortfall in supply

Data collection / monitoring system discovered multiple wells with non-functioning pumps that were running but not drawing water. These pumps were either repaired or replaced.

**RESULTED IN:**

Main well field electricity costs dropped from 12,400 JOD/mo to 5,600 JOD/mo = SAVINGS of 6,800 JOD/mo
Problems From Lack of Evidence

USAID Effective Water, Sanitation, and Hygiene Services (E-WASH)

Nigeria State Water Boards

- Manual customer records & billing
- Little or no production data
- Little or no metering of supply or distribution
- No O&M plans
- Data collection defunct and no KPIs used
- No institutional mandate for sanitation
Example from:

• Mozambique

Evidence-based Decision-making in Action:
Policy Makers & Sector Managers
What are Private Water Network Service Providers?

- Local water services providers
- Smaller than the utility
- Larger than the water vendors/carriers
- Operate in utility area of jurisdiction
The Challenge

- Population: approximately 2 million
- Public utility (ARdM) not covering many parts of the city, also less than 10 hrs supply
- Government unaware of scale of problem – existence of FPAs
- Though common feature in African cities, scale is unique to Mozambique
- Government Department (DNA) was willing to address the issues but was in self denial
- Unlicensed, high tariffs, flexible, in the community, small businesses – family run, water quality
Public utility tariffs are low and also service provision is not reliable.

Inventory - July 2013 – 816 FPAs owned and managed by 502 entrepreneurs.

The 816 FPAs serve a total of 192,000 households compared to 185,000 served by ARdM (some households 2 connections).

Private investments in the systems total approximately $35 Million ($10 – 50,000 each).

2,901 employees in the Water Sector.
The Power of Evidence

- Government developed **policy and legislation** to motivate and stimulate Private sector participation in water services – licensing included.
- **Licensing framework** defined – Municipalities responsible for licensing with key institutions providing advice for license to be granted i.e. FIPAG, CRA, DNA.
- CRA **agreed to regulate** the FPAs i.e. tariff, water quality, service quality (customer care, timing, value for money) etc.
New Kinds of Evidence

Donors are key decision-makers as well

• **Political Economy Analysis (PEA)** is a powerful tool to inform donor programming and work beyond the technical issues.

• Identifies the key constraints and opportunities, usually behind the scenes, to strengthen governance and accelerate adoption of reforms.

• **Monitoring, Evaluation & Learning (MEL)** is being used not just to report progress, but to inform implementation.

• This evidence informs ongoing implementation through adaptive management.

• MEL evidence used to design more responsive and adaptive programs as well.
Making Information Accessible

KEEP IT SIMPLE

• Turning data into evidence
• Calibrate analysis, systems, and support to the needs of the end user
• Data visualization
It's What You Do With the Data That Counts
Questions?