Exploring Solutions for Sustainable Rural Drinking Water Systems in Newfoundland and Labrador

Sustainable Drinking Water Management- A Tall Order for Local Governments

Sarah Minnes, MSc (Planning)
Project Coordinator, PhD Student

Kelly Vodden, Associate Professor (Research)
Principal Investigator

CRRF 2014

Municipalities Newfoundland and Labrador

PMA Professional Municipal Administrators

GRENFELL CAMPUS | MEMORIAL UNIVERSITY

Major Components of Research

(DOEC Annual Report, 2012)

- Source water quality and quantity
- Infrastructure and operations
- Policies and governance
- Public perception, awareness, and demand

Research Team

Principal Investigator

- Kelly Vodden, EPI, Grenfell Campus- MUN

Co-Investigators

- Bing Chen, Faculty of Engineering, MUN
- Maura Hanrahan, EPI, Grenfell Campus- MUN
- Andreas Klinke, EPI, Grenfell Campus- MUN
- Mano Krishnapillai, Environmental Science, Grenfell Campus-MUN
- Atanu Sarkar, Faculty of Medicine, MUN
- Michael van Zyll De Jong, EPI, MUN

- **Research Assistants**

Community Partners

- Derrick Bragg, President, Professional Municipal Administrators
- Robert Keenan, Community Cooperation Office, Municipalities Newfoundland and Labrador
- Craig Pollett, Municipalities of Newfoundland and Labrador

Advisory Committee

- Faculty of Engineering and Applied Science, MUN
- Faculty of Medicine, MUN
- Municipalities Newfoundland and Labrador, Small Towns Director
- Eastern Regional Health Authority
- Municipal Operator/Town Manager
- Department of Environment and Conservation- Water Resources Branch
- Department of Natural Resources
- Department of Municipal Affairs
- Department of Health and Community Services
- Atlantic Canada Opportunities Agency
- Health Canada
- Newfoundland and Labrador Environmental Industry Association
- Atlantic Canada Water and Wastewater Association

Industrial Partners

Corner Brook Pulp and Paper Limited, Corner Brook, NL

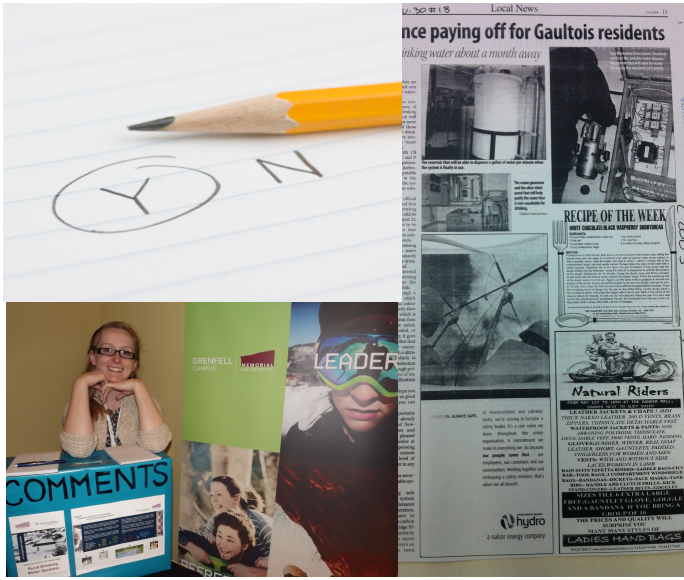
Ducks Unlimited, Corner Brook, NL

Compusult Limited, Mount Pearl, NL

Townsuite Municipal Software-PROCOM Data Services Inc., Gander, NL

Methods

- Literature Review
- Media Scan
- Legislation and Policy Review (DPSIR)
  - Policy workshop
- Community Surveys and Consultations
- Case Studies
- Key Informant Interviews

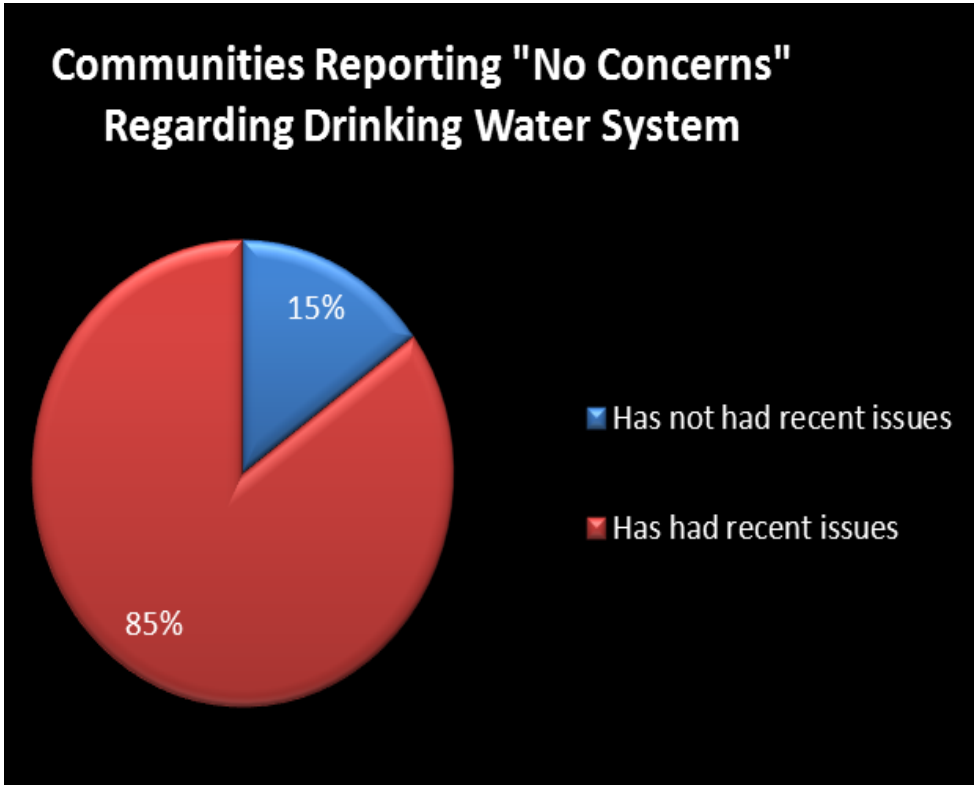


Source Water

- DBPs a concern in many communities including most case studies
  - Challenges with dissolved organic content
  - Filtration/other DBP reducing technologies uncommon
- Aesthetics (including taste and colour) a concern in many communities
- Some communities indicated issues with low water levels
- Monitoring of PPWSAs lacking at the local level
- Watershed management plans uncommon

Administrator's Level Awareness

- **27/40** communities that said they had "no concerns with their drinking water system" had no current DWQI ranking in Winter 2014
- **59%** of respondents who indicated that they had not had any issues with THMs/HAAs in the last 4 years had exceeded the recommended limit at least once in that timeframe



Degrading Infrastructure

- **81%** of **LSDs** and **65%** of **MOTOLs** administrators said:
  - Drinking water infrastructure required repairs or upgrades

- Water Operators: **73%** of **LSDs** and **65%** **MOTOLs**
  - Age of system biggest problem other than financial constraints

Source: Paula Dawe

- Total MIGA water infrastructure funding for 2008-2014:
  - Average of **$15.8M** per year given to **COTOLs** for drinking water infrastructure projects

- MNL survey anticipates COTOLs spending **$28M** per year on water related capital costs for next 10 years.

Asset Management

- **33%** of **LSD** and **29%** of **MOTOL** water operators said:
  - Lack of maps, as-builts, and digitized mapping of community infrastructure was the biggest issue in their community
- **52%** of **LSD** and **16% MOTOL** community administrators
  - Had no maps or blueprints of drinking water infrastructure
- **17%** of operators from **LSDs** and **8%** from **MOTOLs** said they had an organized leak detection program.
  - Yet 20% of LSDs and 27% of MOTOLs had 5+ leaks in 2012 that required repairs.

Asset Management – A solution?

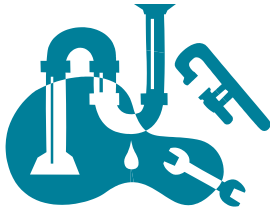
Poor Maintenance

+

Not Charging Enough for Service

=

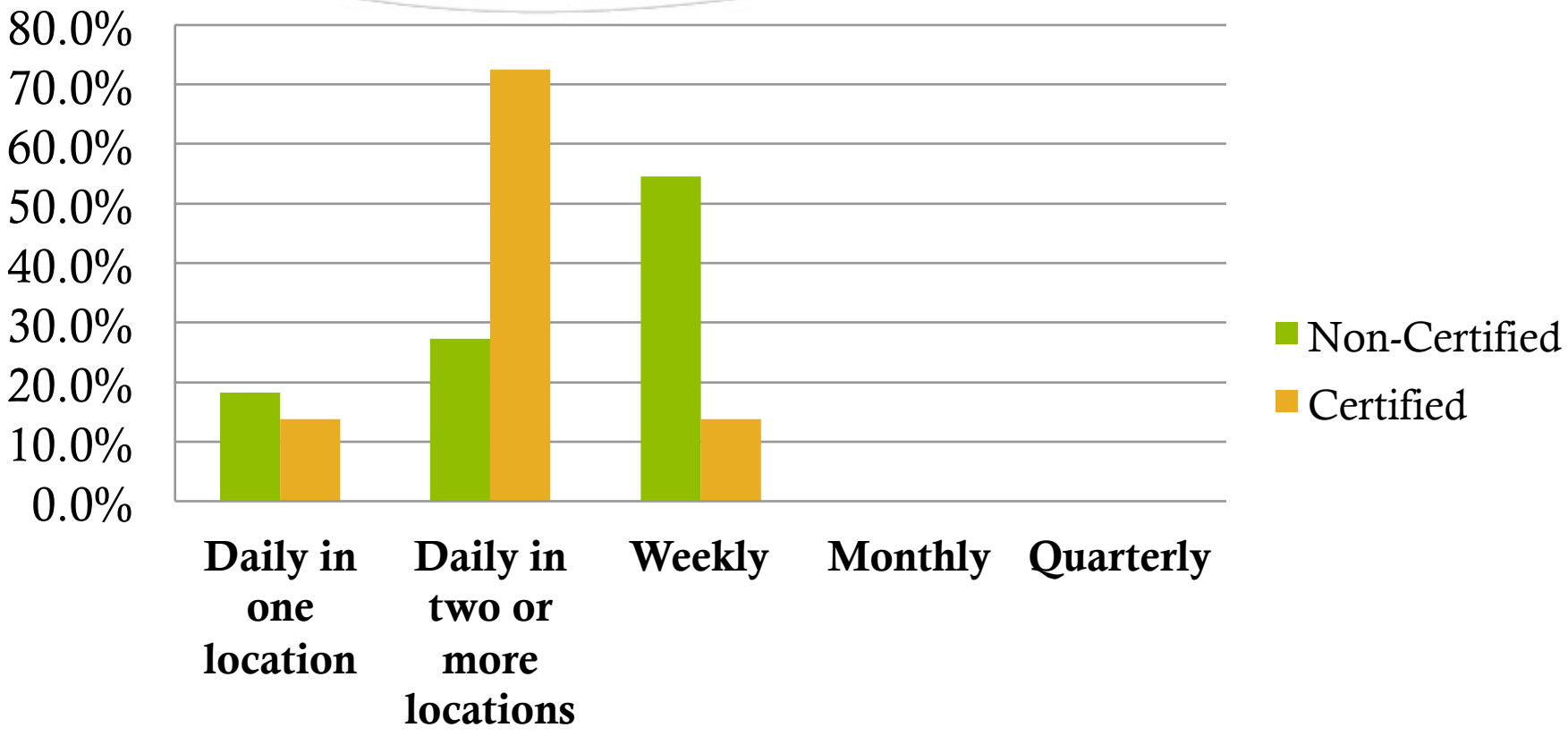
More frequent repairs and no money



Operations and Training

- Community administrator survey
  - **35%** of **LSD** operators and **21%** of **MOTOLs** have water operators with **no certification**
  - **35%** of administrators in **LSDs/33%** in **MOTOLs** did not know what if/what level of certification their water operator held
- According to water operators survey: Certified water operators
  - More likely to have complete maps of piped infrastructure
  - More likely to report having a specific office or filing area for drinking water system information
  - More likely to have a maintenance plan for the water treatment system/ plant operations

Operations and Training

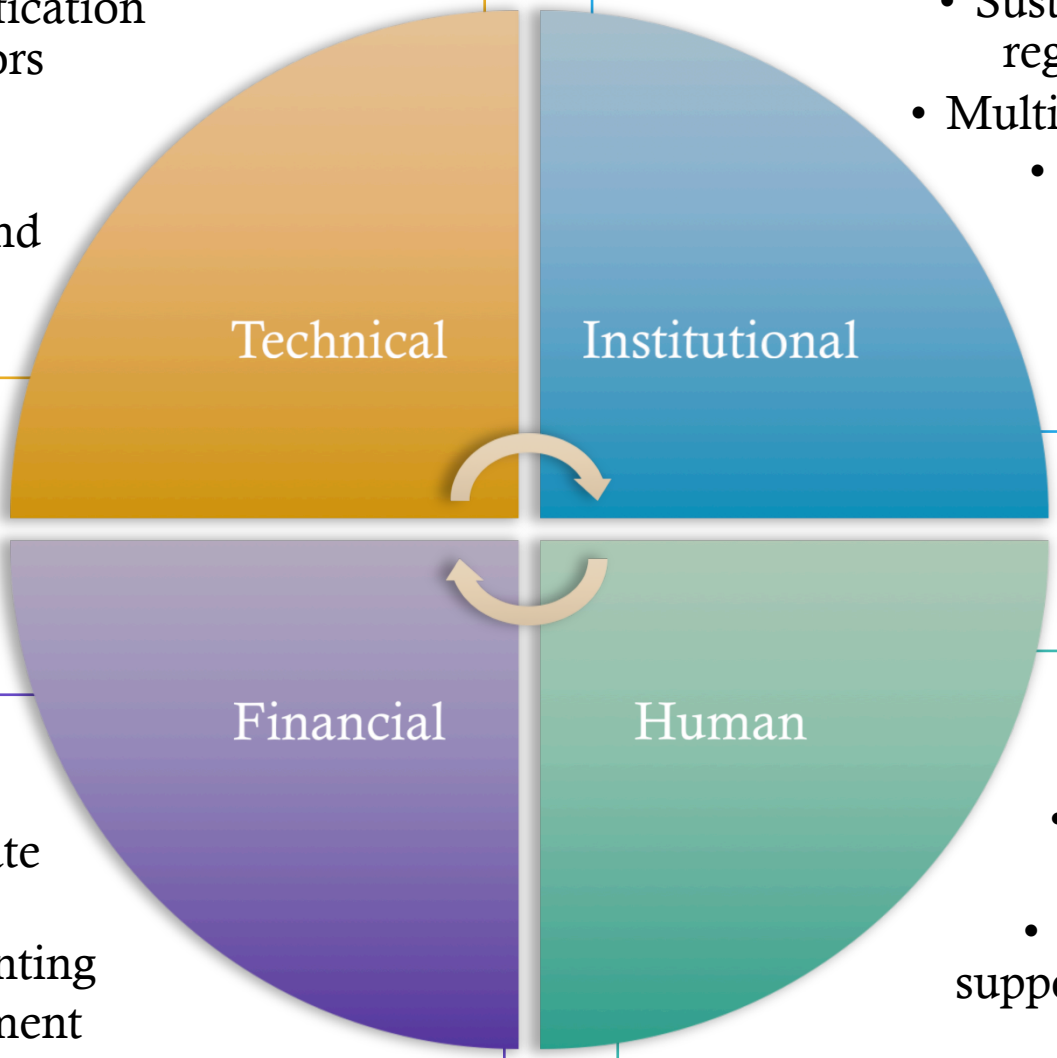


Regional Approaches

- Need due to lack of financial and human resources
- Mixed success across province
- Provincial actors and some local actor recognized need for more regional approaches
- Need more institutional support

Conclusions: Capacity Building Needed

- Mandatory certification for water operators
  - Self reporting
- Education for administrators and decision makers
- Public outreach



- Sustained funding for regional approaches
- Multi-level governance
- Inter-community agreements

- Place appropriate infrastructure
- Full cost accounting
- Asset management activities

- Regional water operators
- Greater regional support by Provincial level

Thank you!

And stay in touch!

- Visit our website: http://nlwater.ruralresilience.ca
- Contact Sarah Minnes,

  Project Coordinator,

  Environmental Policy Institute,

  Grenfell Campus

  sminnes@grenfell.mun.ca

Funding support from the Harris Centre – RBC Water Research and Outreach Fund is gratefully acknowledged

Closing Discussion

- Any questions? Comments? Concerns?
- Do any of you do research in rural communities?
  - What kinds of drinking water challenges have you encountered?
  - Solutions?

Areas for Future Research

Water Supply

- Assessment of challenges and solutions related to private well supplies.
- Baseline studies on all drinking water supplies in NL (e.g. characteristics, threats, etc.).
- Contributing factors to water shortages in NL communities as well as potential solutions.

Technology & Operations

- Small systems operational best practices / technologies that are appropriate and feasible for the rural NL context.
- Feasibility of remote technologies
- A cost-benefit analysis of implementing filtration and/or other DBP reducing technologies within small-scale systems as well as at the household level.
- Effectiveness of PWDUs as solution.

Areas for Future Research

Human Health Implications

- Resident perceptions (e.g. risks, preferences) and uses of drinking water (e.g. types of water sources and consumptions levels).
- Population based research on gastrointestinal illnesses in communities with long-term BWAs, short-term BWAs and those not on a BWA
- Long term health impacts of DBPs

Policy & Governance

- Feasibility of and options for water conservation programs and related outreach activities.
- Feasibility of regional water operators/regional approaches.
- New governance options for source water protection and watershed planning.
- Improved indicators for drinking water sustainability
- Accurate full cost accounting for drinking water.
- Feasibility of a specific drinking water act for NL.