Field study on multiple household water sources and uses in Pacific Island Countries

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Introduction

Global WaSH research typically neglects aspects of household water management that are essential in many developing country settings. Notable among these are a lack of understanding of: (1) the role of multiple water sources in daily household (HH) water management, (2) the practice of moving the use to the source and its impact on reducing daily HH water volume needs, and (3) the practice of adapting these and other HH water practices to differences in seasonal precipitation.

These deficits are reflected in the almost exclusive focus on the primary HH drinking water source in global surveys (e.g., DHS) and data sources (e.g., JMP). Although knowledge gaps have been recently acknowledged by WaSH researchers[1,2] there have been few efforts to address them. Addressing these knowledge gaps around HH water management is essential to understand or model the impacts of water on health/hygiene, livelihoods and climate change resilience and adaptation.

This poster reports on the use of a novel and concise survey instrument to provide detailed data on these topics and application of the instrument in Pacific Island Countries (PICs). HH survey data from eleven diverse communities (n = 405) of the Republic of the Marshall Islands (RMI) and Solomon Islands (SI) is presented, describing:

(1) number and type of HH water sources and their uses,
(2) changes in sources and uses between wet and dry seasons, and
(3) water use at the home and at the source.
(4) integration of the survey instrument into the SurveyCTO Android app for rapid delivery and automated data processing.

Project & Study Design

This study is part of the Pacific Adaptation to Climate Change and Water, Sanitation and Hygiene (PACCWASH) project, funded by the Australian Department of Foreign Affairs and Trade (DFAT) under the Australian Development Research Awards (ADRA) program.

The PACCWASH project is focused on:

- understanding climate vulnerability and adaptation in atolls and flood-prone islands,
- developing conceptual and quantitative (Bayesian) participatory models,
- empowering local stakeholders to understand and address climate-related risk and
- influencing policy and decision-making around climate and water and sanitation.

Table 1: Number of household surveys conducted in each of eight RMI (n=299) and five SI (n=106) communities.

Country	Community	Households
RMI	Jenrok	33
RMI	Laura	34
RMI	Arno	33
RMI	Lae	41
RMI	Ujae	43
RMI	Likiep	35
RMI	Wotje	40
RMI	Ailuk	40
SI	Suaghi	20
SI	Verahue	24
SI	Aifera	24
SI	Radefasu	21
SI	California	17

This poster reports on the results of household surveys conducted in eight RMI communities (n=299) and five SI communities (n=106) between August 2014 and November 2015.

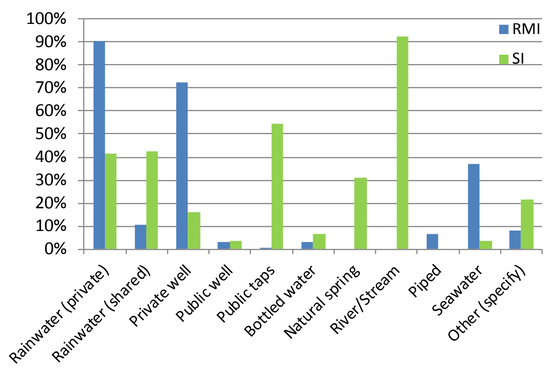





Results & Discussion

Most HHs (92%) reported using multiple water sources daily under normal (non-emergency) conditions; the others were RMI HHs that used private rainwater exclusively. In RMI, the mean number of daily HH water sources was 2.32 (range 1-4) and in SI the mean was 3.19 (range 2-5).

Figure 2: RMI and SI households reporting access to each of these sources.



In RMI, HHs rely primarily on private rainwater for drinking and cooking, with private well water most popular for non-consumptive needs. SI water use is more diverse, with many sources used for both consumptive and non-consumptive purposes, including rivers and public taps (Fig. 2-3). Drinking water sources varied seasonally in SI, whereas most RMI HHs drink private rainwater during wet and dry seasons (Fig. 3-4).

Seasonal differences between RMI and SI seem to have evolved based on historical water availability and precipitation patterns. The dry season is shorter and less extreme in our RMI vs. SI communities and there was less change in seasonal water sources/uses in RMI (Fig. 3-4). Another notable difference, RMI private rainwater harvesting uses 800-3000 liter tanks, whereas private rainwater collection seen in SI was informal, with pots and other small vessels. Rainwater sharing was widely reported in RMI, with little sharing in SI.

Rainwater austerity practices were also reported in RMI, wherein rainwater is reserved for drinking during the dry season. In contrast, no SI HHs reported drinking private rainwater during the dry season and many reported switching from drinking rainwater to lower quality water sources (Fig. 3-4).

Figure 3: RMI and SI households drinking each of these sources during the wet season.

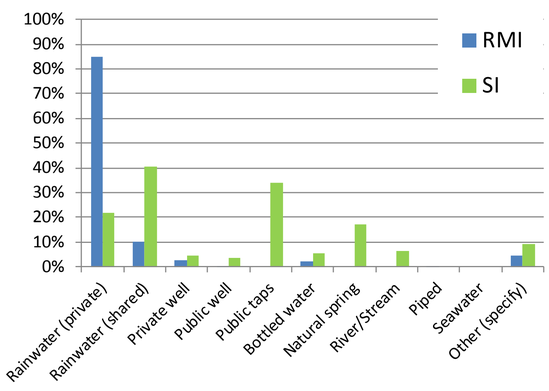
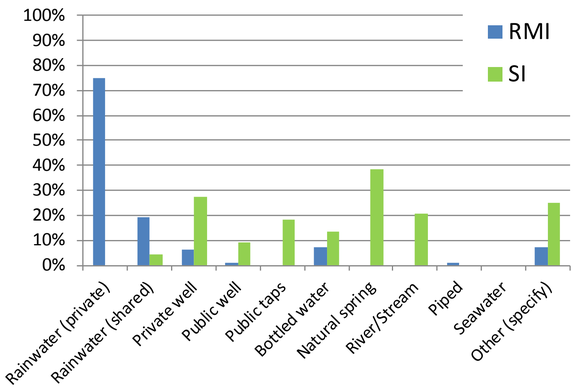


Figure 4: RMI and SI households drinking each of these sources during the dry season.



In both RMI and SI there was a reported trend away from washing hands with water sources located near the home during the dry season. Although our data cannot address the question directly, it is likely that decreased frequency of handwashing would occur when handwashing water is not available at the home.

Transitioning from a paper-based to an Android, tablet-based survey platform using the SurveyCTO app provided numerous advantages for these complex surveys on HH water sources and uses, including: faster delivery, much lower error rates, no parallel data entry and rapid transition from data collection to analysis.[3]

Conclusions

Climate change may jeopardize the adequacy of observed historical adaptations. However, the presence of multiple HH water sources is likely to provide more ability and opportunity to adapt.

HH-level resources can increase community-level resilience to climate-related extremes, particularly where community resources are not maintained and a sharing culture exists around water.

Android, tablet-based surveys using SurveyCTO provided a superior approach to household surveys particularly for multiple water sources and uses surveys with dozens of loops and skip patterns.

References

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